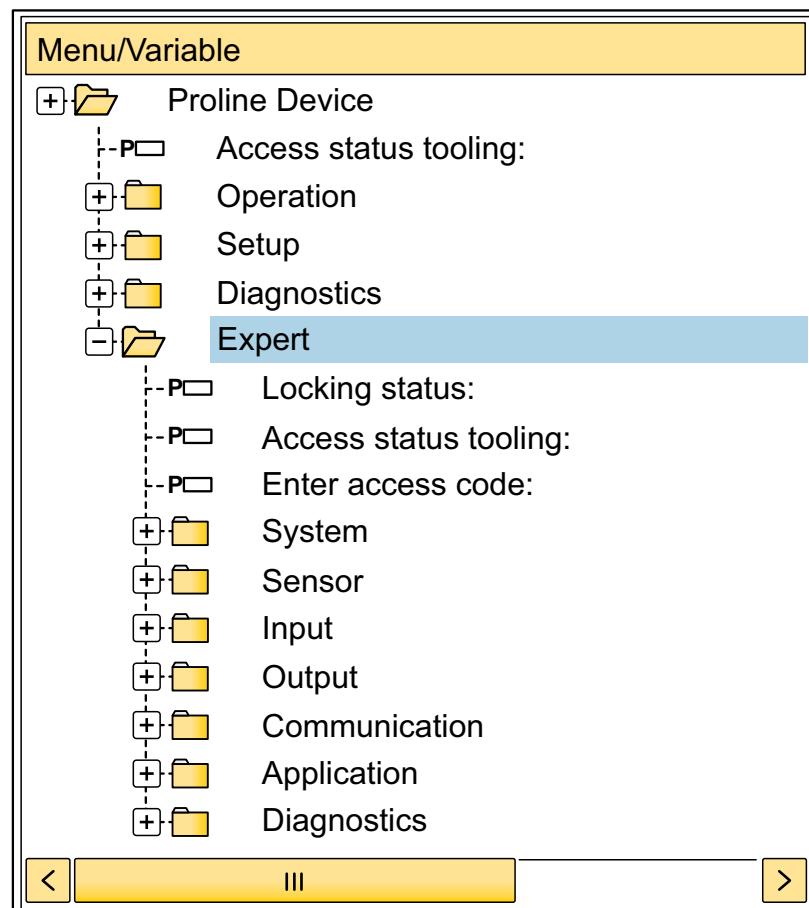


# Description of Device Parameters

## Proline Cubemass 500

### PROFIBUS PA

Coriolis 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

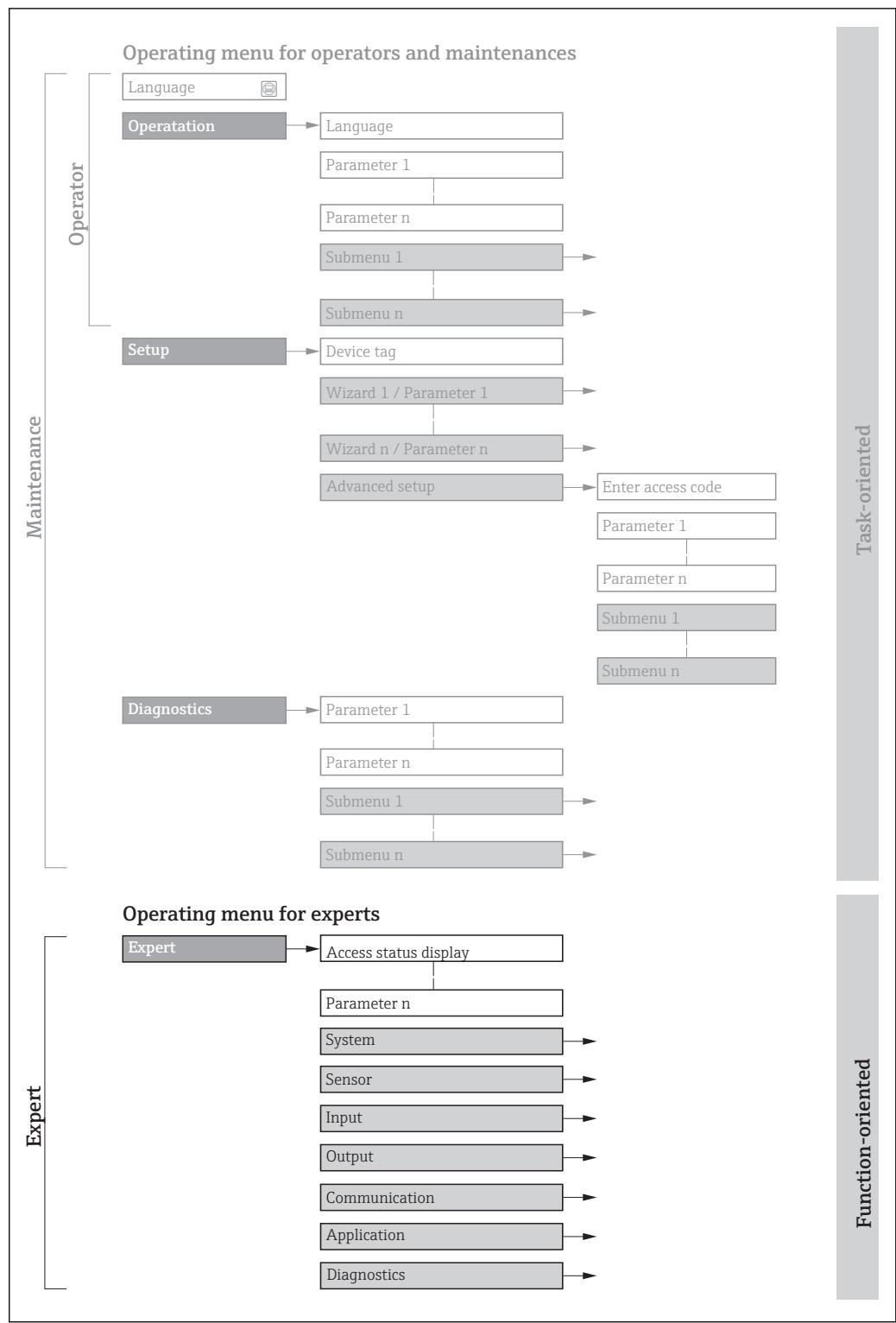
## 1.2     Target group

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 → 7
- Operating concept of the operating menus: Operating Instructions → 7

### 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
Cubemass C 500	BA01549D

### 1.5.2 Supplementary device-dependent documentation

#### Special Documentation

Contents	Documentation code
Information on the Pressure Equipment Directive	SD01614D
Radio approvals for WLAN interface for A309/A310 display module	SD01793D
Web server	SD01676D
Heartbeat Technology	SD01702D
Concentration measurement	SD01719D

## 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="#">40</a>
<b>    Sensor</b>	→ <a href="#">45</a>
► Measured val.	→ <a href="#">45</a>
► System units	→ <a href="#">58</a>
► Process param.	→ <a href="#">66</a>
► Measurement mode	→ <a href="#">74</a>
► External comp.	→ <a href="#">76</a>
► Calculated value	→ <a href="#">79</a>
► Sensor adjustm.	→ <a href="#">82</a>
► Calibration	→ <a href="#">88</a>
<b>    I/O config.</b>	→ <a href="#">90</a>
I/O 1 terminals (3902-1)	→ <a href="#">90</a>
I/O 1 info (3906-1)	→ <a href="#">90</a>

I/O 1 type (3901-1)	→ 91
Apply I/O config (3907)	→ 91
Alteration code (2762)	→ 92
<b>▶ Input</b>	→ 92
▶ Current input 1 to n	→ 92
▶ Status input 1 to n	→ 95
<b>▶ Output</b>	→ 97
▶ Curr.output 1 to n	→ 97
▶ PFS output 1 to n	→ 112
▶ Relay output 1 to n	→ 133
<b>▶ Communication</b>	→ 139
▶ PROFIBUS PA conf	→ 140
▶ PROFIBUS PA info	→ 141
▶ Physical block	→ 143
▶ Web server	→ 152
▶ WLAN settings	→ 156
<b>▶ Analog inputs</b>	→ 162
▶ Analog input 1 to n	→ 163
<b>▶ Discrete inputs</b>	→ 176
▶ Discrete input 1 to n	→ 176
<b>▶ Analog outputs</b>	→ 183
▶ Analog output 1 to n	→ 183
<b>▶ Discrete outputs</b>	→ 195
▶ Discr. out. 1 to n	→ 195

► Application	→ ↗ 205
► Totalizer 1 to n	→ ↗ 206
► Concentration	→ ↗ 219
► Diagnostics	→ ↗ 219
Actual diagnos. (0691)	→ ↗ 220
Prev.diagnostics (0690)	→ ↗ 221
Time fr. restart (0653)	→ ↗ 222
Operating time (0652)	→ ↗ 222
► Diagnostic list	→ ↗ 222
► Event logbook	→ ↗ 227
► Device info	→ ↗ 229
► Mainboard module	→ ↗ 232
► Sens. electronic	→ ↗ 233
► I/O module 1	→ ↗ 234
► I/O module 2	→ ↗ 235
► Display module	→ ↗ 236
► Min/max val.	→ ↗ 237
► Data logging	→ ↗ 244
► Heartbeat	→ ↗ 253
► Simulation	→ ↗ 254

### 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	
Direct access (0106)	→ 11
Locking status (0004)	→ 12
Access status (0005)	→ 13
Ent. access code (0003)	→ 13
▶ System	→ 13
▶ Sensor	→ 45
▶ I/O config.	→ 90
▶ Input	→ 92
▶ Output	→ 97
▶ Communication	→ 139
▶ Analog inputs	→ 162
▶ Discrete inputs	→ 176
▶ Analog outputs	→ 183
▶ Discrete outputs	→ 195
▶ Application	→ 205
▶ Diagnostics	→ 219

#### Direct access



##### Navigation

Expert → Direct access (0106)

##### Description

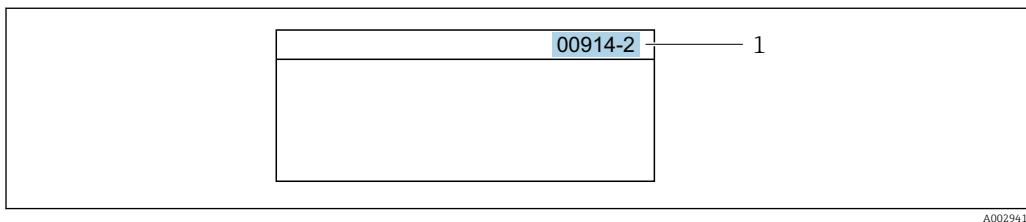
Use this function to enter the access code to enable direct access to the desired parameter via the local display. A parameter number is assigned to each parameter for this purpose.

##### 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

A0029414

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
- 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 → 7

*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) .
Temp. locked (priority 2)	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 →  7</p>

---

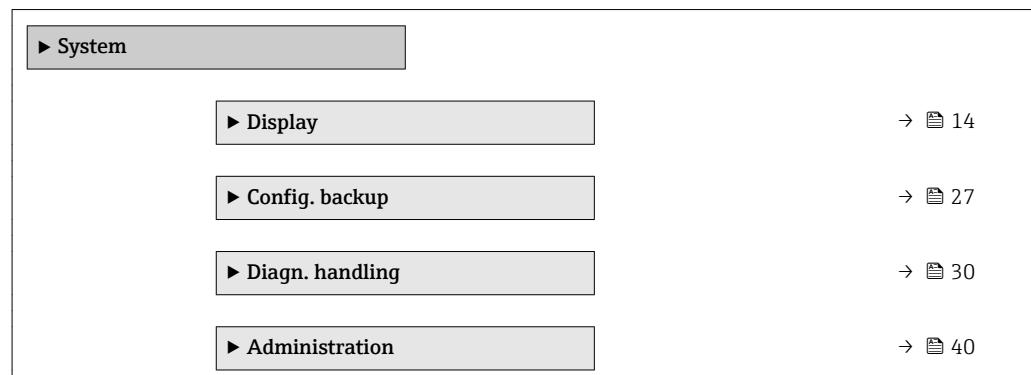
**Ent. access code**

---

<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>	0 to 9 999

### 3.1 "System" submenu

*Navigation*   Expert → System



### 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)	→ 20
Decimal places 1 (0095)	→ 20
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)
- Bahasa Indonesia
- 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.
- Bargr. + 1 value
- 2 values
- Val. large+2val.
- 4 values

**Factory setting** 1 value, max.

**Additional information***Description*

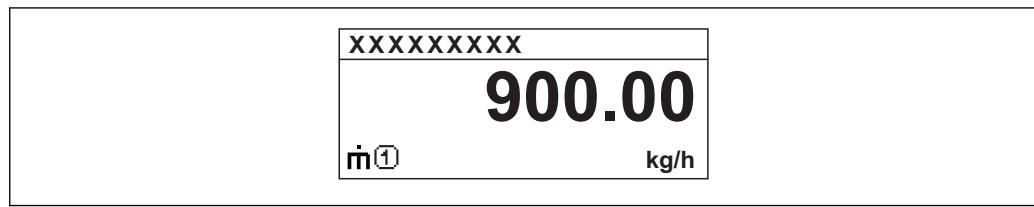
The display format (size, bar graph etc.) and number of measured values displayed simultaneously (1 to 4) can be configured. This setting only applies to normal operation.



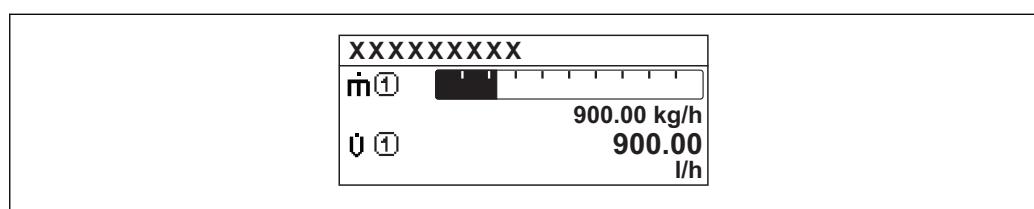
- The **Value 1 display** parameter (→ 18) to **Value 4 display** parameter (→ 23) are used to specify which measured values are shown on the local display and in what order.
- If more measured values are specified than the display mode selected permits, then the values alternate on the device display.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

Possible measured values shown on the local display:

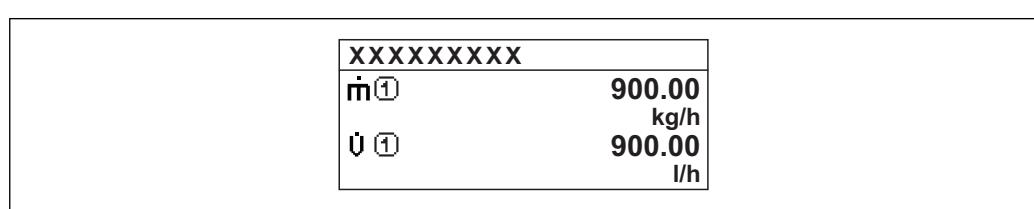
"1 value, max." option



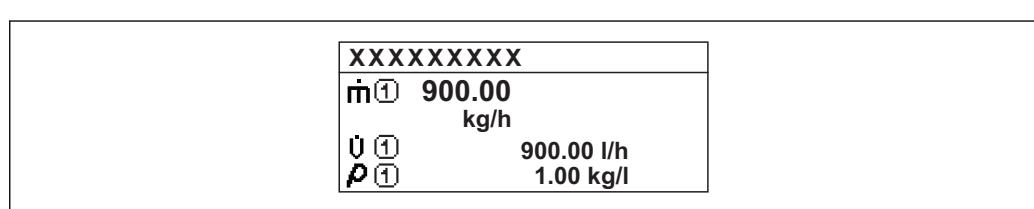
"Bagr. + 1 value" option



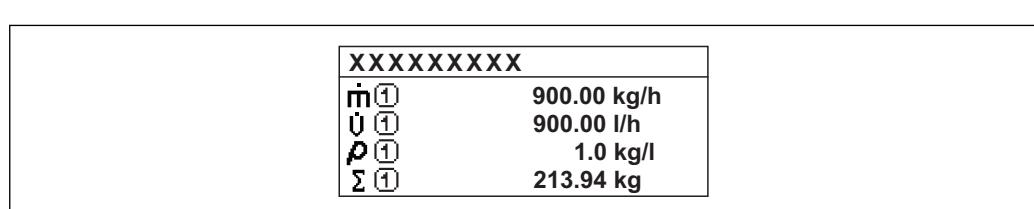
"2 values" option



"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 to be shown on the local display.

**Selection**

- Mass flow
- Volume flow
- Correct.vol.flow \*
- Target mass flow \*
- Carrier mass fl.
- Target vol. flow \*
- Carrier vol. fl.
- Targ.corr.vol.fl \*
- Carr.corr.vol.fl \*
- Density
- Ref.density \*
- Concentration \*
- Temperature
- Carr. pipe temp. \*
- Electronic temp.
- Osc. freq. 0
- Osc. ampl. 0 \*
- Freq. fluct. 0 \*
- Osc. damping 0 \*
- Osc.damp.fluct 0 \*
- Signal asymmetry \*
- Exc. current 0 \*
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Curr.output 1 \*
- Pressure

**Factory setting**

Mass flow

---

\* Visibility depends on order options or device settings

**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 (→ 58).

*Selection***▪ Oscil. frequency** option

Displays the current oscillation frequency of the measuring tubes. This frequency depends on the density of the medium.

**▪ Oscil. amplitude** option

Displays the relative oscillation amplitude of the measuring tubes in relation to the preset value. This value is 100 % under optimum conditions.

**▪ Oscil. damping** option

Displays the current oscillation damping. Oscillation damping is an indicator of the sensor's current need for excitation power.

**▪ Signal asymmetry** option

Displays the relative difference between the oscillation amplitude at the inlet and outlet of the sensor. The measured value is the result of production tolerances of the sensor coils and should remain constant over the life time of a sensor.

---

0% bargraph 1**Navigation**

Expert → System → Display → 0% bargraph 1 (0123)

**Prerequisite**

A local display is provided.

**Description**

Use this function to enter the 0% bar graph value to be shown on the display for the measured value 1.

**User entry**

Signed floating-point number

**Factory setting**

Country-specific:

- 0 kg/h
- 0 lb/min

**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 (→ 58).

## 100% bargraph 1



### Navigation

Expert → System → Display → 100% bargraph 1 (0125)

### Prerequisite

A local display is provided.

### Description

Use this function to enter the 100% bar graph value to be shown on the display for the measured value 1.

### User entry

Signed floating-point number

### Factory setting

Depends on country and nominal diameter → [264](#)

### 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 (→ [58](#)).

## Decimal places 1



### Navigation

Expert → System → Display → Decimal places 1 (0095)

### Prerequisite

A measured value is specified in the **Value 1 display** 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.

<b>Description</b>	Use this function to select one of the measured values to be shown on the local display.
<b>Selection</b>	For the picklist, see the <b>Value 1 display</b> parameter (→ 18)
<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 (→ 58).</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><input type="checkbox"/> X</li> <li><input type="checkbox"/> X.X</li> <li><input type="checkbox"/> X.XX</li> <li><input type="checkbox"/> X.XXX</li> <li><input type="checkbox"/> 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 to be shown on the local display.
<b>Selection</b>	For the picklist, see the <b>Value 1 display</b> parameter (→ 18)
<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 (→ 58).

---

**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-specific:

- 0 kg/h
- 0 lb/min

**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 (→ 58).

---

**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 (→ 58).

---

**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 to be shown on the local display.

**Selection**

For the picklist, see the **Value 1 display** parameter (→ 18)

**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 (→ 58).

---

**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

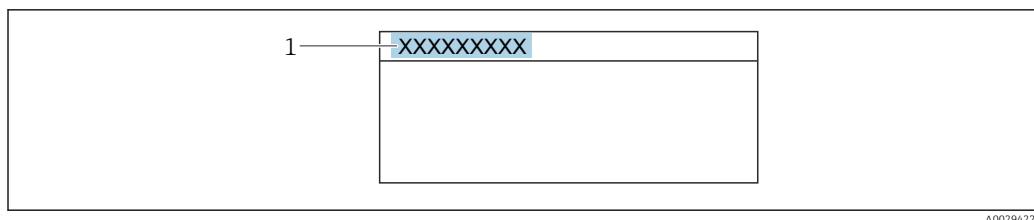
**Factory setting**

Device tag

**Additional information***Description*

The header text only appears during normal operation.

1) proportional transmission behavior with first order delay



A0029422

1 Position of the header text on the display

#### Selection

- Device tag  
Is defined in the **Device tag** parameter (→ 229).
- 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. @, %, /)

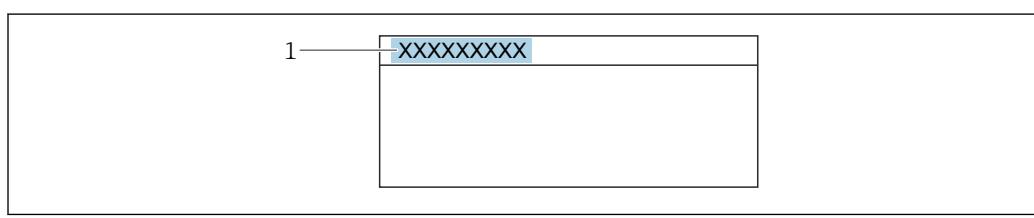
### Factory setting

-----

### Additional information

#### Description

The header text only appears during normal operation.



A0029422

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"

**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	→  28	
Last backup	→  28	

Config. managem.	→  28
Backup state	→  29
Compar. result	→  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*

<b>Options</b>	<b>Description</b>
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.

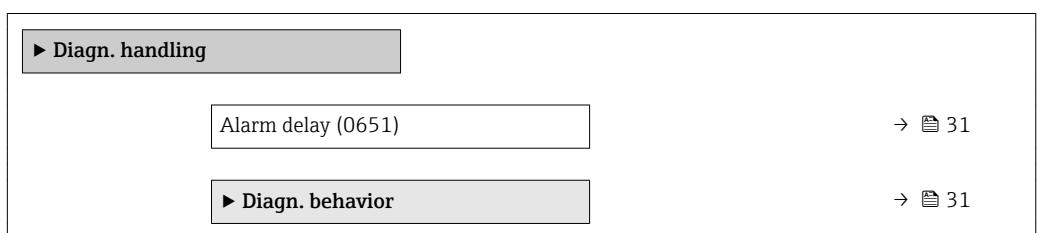
#### *HistoROM*

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:

- 046 Sensor limit
- 140 Sensor sig.asym.
- 144 MeasErrorTooHigh
- 830 Sensor temp.
- 831 Sensor temp.
- 832 Electronic temp.
- 833 Electronic temp.
- 834 Process temp.
- 835 Process temp.
- 843 Process limit
- 862 Partly filled
- 912 Medium inhomog.
- 913 Medium unsuitab.
- 944 MonitoringFailed

**"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:

Diagnostic behavior	Description
Alarm	The device stops measurement. The totalizers assume the defined alarm condition. A diagnostic message is generated.
Warning	The device continues to measure. The measured value output via PROFIBUS and the 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 (→  227) ( <b>Event list</b> submenu (→  228)) and not 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. 046 (0709)	→  33
Diagnostic no. 140 (0708)	→  33
Diagnostic no. 144 (0731)	→  33
Diagnostic no. 374 (0710)	→  34
Diagnostic no. 302 (0739)	→  34
Diagnostic no. 441 (0657)	→  34
Diagnostic no. 442 (0658)	→  35
Diagnostic no. 443 (0659)	→  35
Diagnostic no. 444 (0740)	→  35
Diagnostic no. 830 (0800)	→  36
Diagnostic no. 831 (0641)	→  36
Diagnostic no. 832 (0681)	→  36
Diagnostic no. 833 (0682)	→  37
Diagnostic no. 834 (0700)	→  37
Diagnostic no. 835 (0702)	→  37
Diagnostic no. 842 (0638)	→  38
Diagnostic no. 862 (0679)	→  38
Diagnostic no. 912 (0703)	→  38
Diagnostic no. 913 (0712)	→  39
Diagnostic no. 944 (0732)	→  39
Diagnostic no. 948 (0744)	→  40

---

**Diagnostic no. 046 (Sensor limit)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 046 (0709)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>046 Sensor limit</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>	Alarm
<b>Additional information</b>	Detailed description of the options available for selection:

---

**Diagnostic no. 140 (Sensor sig.asym.)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 140 (0708)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>140 Sensor sig.asym..</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>	Alarm
<b>Additional information</b>	Detailed description of the options available for selection:

---

**Diagnostic no. 144 (MeasErrorTooHigh)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 144 (0731)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>144 MeasErrorTooHigh</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>	Alarm
<b>Additional information</b>	Detailed description of the options available for selection:

**Diagnostic no. 374 (Sensor electron.)****Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 374 (0710)

**Description**Option for changing the diagnostic behavior of the diagnostic message **374 Sensor electron..****Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

**Additional information**

Detailed description of the options available for selection:

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

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 302 (0739)

**Description**Option for changing the diagnostic behavior of the diagnostic message **302 Verific. active.****Selection**

- Alarm
- Warning

**Factory setting**

Warning

**Additional information**

Detailed description of the options available for selection:

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

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 441 (0657)

**Description**Option for changing the diagnostic behavior of the diagnostic message **441 Curr.output 1 to n.****Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

**Additional information**

Detailed description of the options available for selection:

---

**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
<b>Additional information</b>	Detailed description of the options available for selection:

---

**Diagnostic no. 443 (Pulse output 1 to n)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 443 (0659)
<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>443 Pulse 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>	Detailed description of the options available for selection:

---

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

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 444 (0740)
<b>Prerequisite</b>	The device has one current input.
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>444 Current input 1 to n</b> .

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

**Additional information** Detailed description of the options available for selection:**Diagnostic no. 830 (Sensor temp.)****Navigation**  Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 830 (0800)**Description**Option for changing the diagnostic behavior of the diagnostic message **830 Sensor temp..****Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

**Additional information** Detailed description of the options available for selection:**Diagnostic no. 831 (Sensor temp.)****Navigation**  Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 831 (0641)**Description**Option for changing the diagnostic behavior of the diagnostic message **831 Sensor temp..****Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

**Additional information** Detailed description of the options available for selection:**Diagnostic no. 832 (Electronic temp.)****Navigation**  Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 832 (0681)**Description**Option for changing the diagnostic behavior of the diagnostic message **832 Electronic temp..**

<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>	Logbook only
------------------------	--------------

<b>Additional information</b>	 Detailed description of the options available for selection:
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**Diagnostic no. 833 (Electronic temp.)**

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<b>Navigation</b>	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 833 (0682)
-------------------	---

<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>	Logbook only
------------------------	--------------

<b>Additional information</b>	 Detailed description of the options available for selection:
-------------------------------	--

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

---



<b>Navigation</b>	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 834 (0700)
-------------------	---

<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>	 Detailed description of the options available for selection:
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**Diagnostic no. 835 (Process temp.)**

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<b>Navigation</b>	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 835 (0702)
-------------------	---

<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>835 Process temp.</b> .
--------------------	--

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

**Additional information**

Detailed description of the options available for selection:

**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 **Process limit**.**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Off

**Diagnostic no. 862 (Empty pipe)****Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 862 (0679)

**Description**Option for changing the diagnostic behavior of the diagnostic message **862 Empty pipe**.**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

**Additional information**

Detailed description of the options available for selection:

**Diagnostic no. 912 (Medium inhomog.)****Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 912 (0703)

**Description**Option for changing the diagnostic behavior of the diagnostic message **912 Medium inhomog..**

<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:
-------------------------------	--

---

**Diagnostic no. 913 (Medium unsuitab.)**

---



<b>Navigation</b>	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 913 (0712)
-------------------	---

<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>913 Medium unsuitab..</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
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<b>Additional information</b>	 Detailed description of the options available for selection:
-------------------------------	--

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**Diagnostic no. 944 (MonitoringFailed)**

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<b>Navigation</b>	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 944 (0732)
-------------------	---

<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>944 MonitoringFailed.</b>
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<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:
-------------------------------	--

**Diagnostic no. 948 (Oscill. damping)****Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 948 (0744)

**Description**

Option for changing the diagnostic behavior of the diagnostic message **948 Oscill. damping**.

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

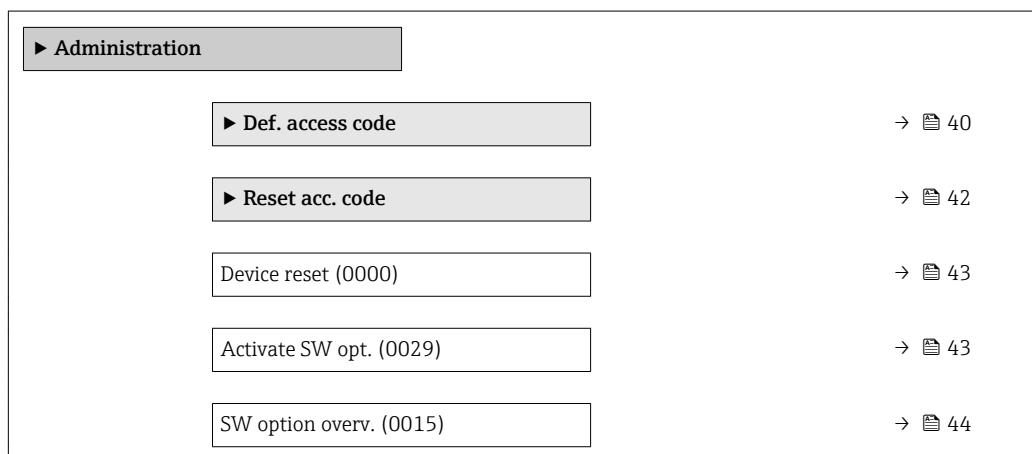
**Additional information**

Detailed description of the options available for selection:

### 3.1.4 "Administration" submenu

**Navigation**

Expert → System → Administration



#### "Def. access code" wizard

The **Def. access code** wizard (→ 40) 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**

Def. access code

→ 41

Confirm code

→ 41

**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**

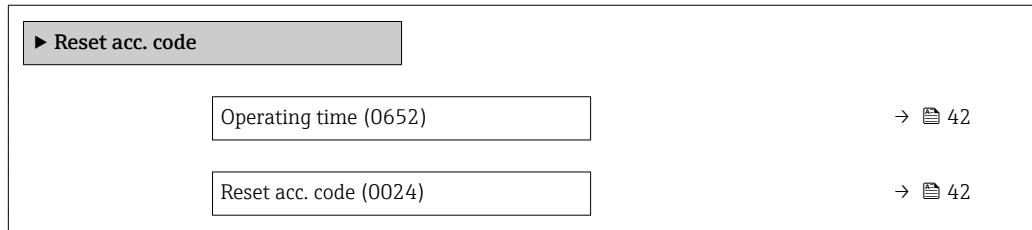
Expert → System → Administration → Def. access code → Confirm code

**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
- Rest.S-DATBackup \*

**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

\* Visibility depends on order options or device settings

**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 (→ 44).
- ↳ 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 (→ 44).

*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 \*
- HBT Monitoring \*
- HBT Verification \*
- Concentration \*

---

\* Visibility depends on order options or device settings

**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"

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

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

*"Concentration" option*

Order code for "Application package", option **ED** "Concentration"

## 3.2 "Sensor" submenu

*Navigation*
 Expert → Sensor

<b>► Sensor</b>	
<b>► Measured val.</b>	→  45
<b>► System units</b>	→  58
<b>► Process param.</b>	→  66
<b>► Measurement mode</b>	→  74
<b>► External comp.</b>	→  76
<b>► Calculated value</b>	→  79
<b>► Sensor adjustm.</b>	→  82
<b>► Calibration</b>	→  88

### 3.2.1 "Measured val." submenu

*Navigation*
 Expert → Sensor → Measured val.

<b>► Measured val.</b>	
<b>► Process variab.</b>	→  46
<b>► Totalizer</b>	→  52

<b>► Input values</b>	→  53
<b>► Output values</b>	→  54

**"Process variab." submenu***Navigation*

Expert → Sensor → Measured val. → Process variab.

<b>► Process variab.</b>	
Mass flow (1838)	→  46
Volume flow (1847)	→  47
Correct.vol.flow (1851)	→  47
Density (1850)	→  47
Ref.density (1852)	→  48
Temperature (1853)	→  48
Pressure value (6129)	→  48
Concentration (1887)	→  48
Target mass flow (1864)	→  49
Carrier mass fl. (1865)	→  49
Targ.corr.vol.fl (1893)	→  50
Carr.corr.vol.fl (1894)	→  50
Target vol. flow (1895)	→  51
Carrier vol. fl. (1896)	→  51

---

**Mass flow**

---

**Navigation**

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

**Description**

Displays the mass flow that is currently measured.

**User interface**

Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Mass flow unit** parameter (→ 59)

---

**Volume flow**

---

**Navigation**

Expert → Sensor → Measured val. → Process variab. → Volume flow (1847)

**Description**

Displays the volume flow currently calculated.

**User interface**

Signed floating-point number

**Additional information***Description*

The volume flow is calculated from the mass flow currently measured and the density currently measured.

*Dependency*

The unit is taken from the **Volume flow unit** parameter (→ 60)

---

**Correct.vol.flow**

---

**Navigation**

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

**Description**

Displays the corrected volume flow currently measured.

**User interface**

Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Cor.volflow unit** parameter (→ 62)

---

**Density**

---

**Navigation**

Expert → Sensor → Measured val. → Process variab. → Density (1850)

**Description**

Displays the density currently measured.

**User interface**

Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Density unit** parameter (→ 63)

## Ref.density

---

<b>Navigation</b>	  Expert → Sensor → Measured val. → Process variab. → Ref.density (1852)
<b>Description</b>	Displays the reference density currently calculated.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Ref. dens. unit</b> parameter (→ <a href="#">64</a> )

---

## Temperature

---

<b>Navigation</b>	  Expert → Sensor → Measured val. → Process variab. → Temperature (1853)
<b>Description</b>	Displays the medium temperature currently measured.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Temperature unit</b> parameter (→ <a href="#">64</a> )

---

## Pressure value

---

<b>Navigation</b>	  Expert → Sensor → Measured val. → Process variab. → Pressure value (6129)
<b>Description</b>	Displays the fixed or external pressure value.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Pressure unit</b> parameter (→ <a href="#">65</a> )

---

## Concentration

---

<b>Navigation</b>	  Expert → Sensor → Measured val. → Process variab. → Concentration (1887)
<b>Prerequisite</b>	For the following order code: Order code for "Application package", option <b>ED</b> "Concentration"  The software options currently enabled are displayed in the <b>SW option overv.</b> parameter (→ <a href="#">44</a> ).

**Description** Displays the concentration currently calculated.

**User interface** Signed floating-point number

**Additional information** *Dependency*



The unit is taken from the **Concentr. unit** parameter (0613).

---

## Target mass flow

---

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

**Prerequisite** With the following conditions:  
Order code for "Application package", option **ED** "Concentration"



The software options currently enabled are displayed in the **SW option overv.** parameter (→ 44).

**Description** Displays the mass flow currently measured for the target medium.

**User interface** Signed floating-point number

**Additional information** *Dependency*



The unit is taken from the **Mass flow unit** parameter (→ 59)

---

## Carrier mass fl.

---

**Navigation** Expert → Sensor → Measured val. → Process variab. → Carrier mass fl. (1865)

**Prerequisite** With the following conditions:  
Order code for "Application package", option **ED** "Concentration"



The software options currently enabled are displayed in the **SW option overv.** parameter (→ 44).

**Description** Displays the mass flow currently measured for the carrier medium.

**User interface** Signed floating-point number

**Additional information** *Dependency*



The unit is taken from the **Mass flow unit** parameter (→ 59)

---

**Targ.corr.vol.fl**

---

**Navigation**   Expert → Sensor → Measured val. → Process variab. → Targ.corr.vol.fl (1893)

**Prerequisite**

With the following conditions:

- Order code for "Application package", option **ED** "Concentration"
- In the **Liquid type** parameter, the **Ethanol in water** option or **%mass / %volume** option is selected.

 The software options currently enabled are displayed in the **SW option overv.** parameter (→  44).

**Description** Displays the corrected volume flow currently measured for the target fluid.

**User interface** Signed floating-point number

**Additional information** *Dependency*

 The unit is taken from the **Volume flow unit** parameter (→  60)

---

**Carr.corr.vol.fl**

---

**Navigation**   Expert → Sensor → Measured val. → Process variab. → Carr.corr.vol.fl (1894)

**Prerequisite**

With the following conditions:

- Order code for "Application package", option **ED** "Concentration"
- In the **Liquid type** parameter, the **Ethanol in water** option or **%mass / %volume** option is selected.

 The software options currently enabled are displayed in the **SW option overv.** parameter (→  44).

**Description** Displays the corrected volume flow currently measured for the carrier fluid.

**User interface** Signed floating-point number

**Additional information** *Dependency*

 The unit is taken from the **Volume flow unit** parameter (→  60)

---

**Target vol. flow**

---

<b>Navigation</b>	  Expert → Sensor → Measured val. → Process variab. → Target vol. flow (1895)
<b>Prerequisite</b>	With the following conditions: <ul style="list-style-type: none"><li>▪ Order code for "Application package", option <b>ED</b> "Concentration"</li><li>▪ The <b>Ethanol in water</b> option or <b>%mass / %volume</b> option is selected in the <b>Liquid type</b> parameter.</li><li>▪ The <b>%vol</b> option is selected in the <b>Concentr. unit</b> parameter.</li></ul> <p> The software options currently enabled are displayed in the <b>SW option overv.</b> parameter (→  44).</p>
<b>Description</b>	Displays the volume flow currently measured for the target medium.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Volume flow unit</b> parameter (→  60)

---

**Carrier vol. fl.**

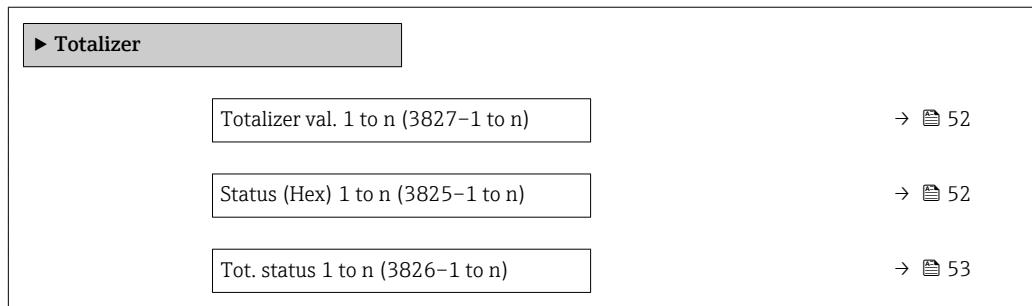
---

<b>Navigation</b>	  Expert → Sensor → Measured val. → Process variab. → Carrier vol. fl. (1896)
<b>Prerequisite</b>	With the following conditions: <ul style="list-style-type: none"><li>▪ Order code for "Application package", option <b>ED</b> "Concentration"</li><li>▪ The <b>Ethanol in water</b> option or <b>%mass / %volume</b> option is selected in the <b>Liquid type</b> parameter.</li><li>▪ The <b>%vol</b> option is selected in the <b>Concentr. unit</b> parameter.</li></ul> <p> The software options currently enabled are displayed in the <b>SW option overv.</b> parameter (→  44).</p>
<b>Description</b>	Use this function to display the volume flow currently measured for the carrier medium.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Volume flow unit</b> parameter (→  60)

### "Totalizer" submenu

#### *Navigation*

Expert → Sensor → Measured val. → Totalizer



---

## Totalizer val. 1 to n

---

#### **Navigation**

Expert → Sensor → Measured val. → Totalizer → Totalizer val. 1 to n (3827-1 to n)

#### **Prerequisite**

In the **Target mode** parameter (→ 212), the **Auto** option is selected.

#### **Description**

Displays the current reading for totalizer 1-3.

#### **User interface**

Signed floating-point number

#### **Additional information**

##### *Description*

**i** In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→ 209).

##### *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 (→ 209).

##### *Dependency*

**i** The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 207).

---

## Status (Hex) 1 to n

---

#### **Navigation**

Expert → Sensor → Measured val. → Totalizer → Status (Hex) 1 to n (3825-1 to n)

#### **Prerequisite**

In **Target mode** parameter (→ 212), the **Auto** option is selected.

#### **Description**

Displays the status value (hex) of the particular totalizer.

#### **User interface**

0 to 0xFF

**Tot. status 1 to n**

**Navigation**      Expert → Sensor → Measured val. → Totalizer → Tot. status 1 to n (3826–1 to n)

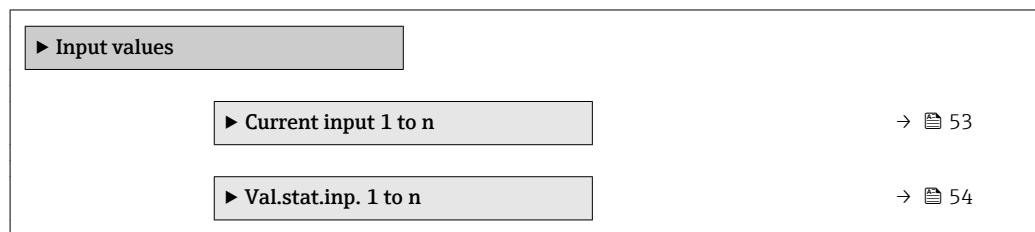
**Description**      Displays the status of the particular totalizer.

**User interface**

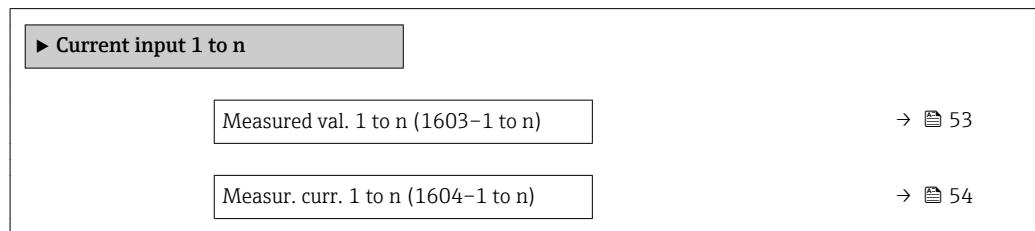
- Good
- Uncertain
- Bad

**"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

**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**

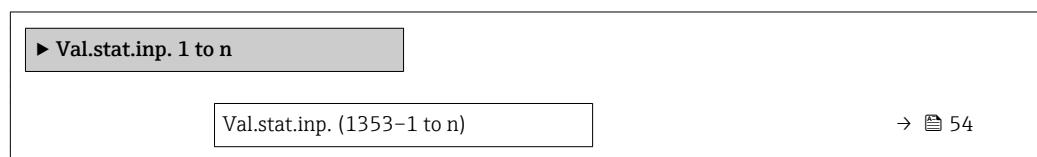
Displays the current value of the current input.

**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.****Navigation**

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

**Description**

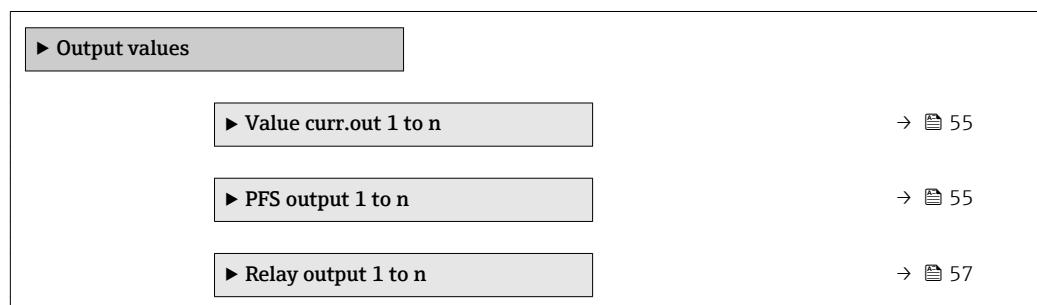
Displays the current input signal level.

**User interface**

- High
- Low

*"Output values" submenu**Navigation*

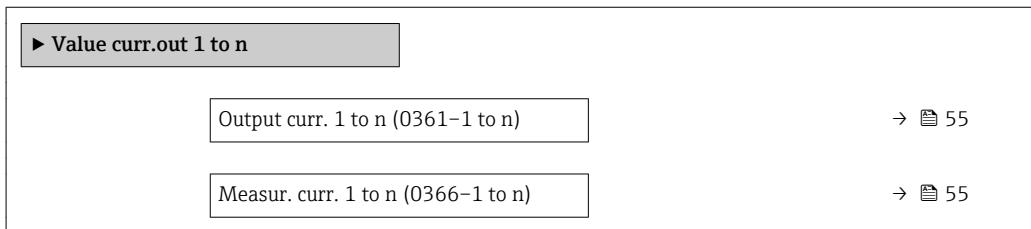
Expert → Sensor → Measured val. → Output values



*"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.

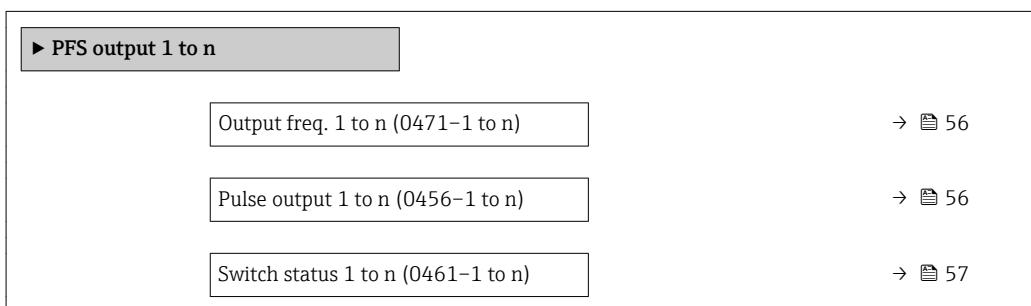
**User interface**

0 to 30 mA

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

**Navigation**

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

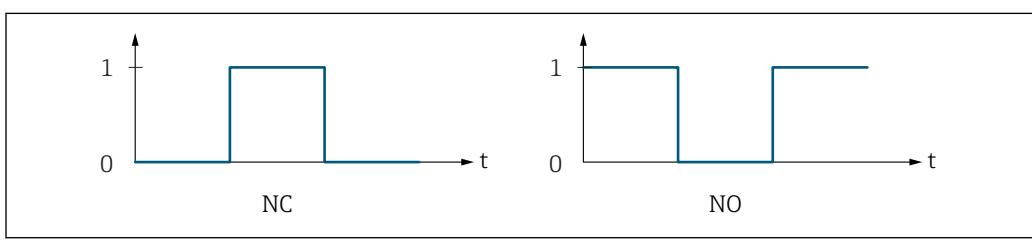


## Output freq. 1 to n

<b>Navigation</b>	 Expert → Sensor → Measured val. → Output values → PFS output 1 to n → Output freq. 1 to n (0471–1 to n)
<b>Prerequisite</b>	In the <b>Operating mode</b> parameter (→ 114), 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

## Pulse output 1 to n

<b>Navigation</b>	 Expert → Sensor → Measured val. → Output values → PFS output 1 to n → Pulse output 1 to n (0456–1 to n)
<b>Prerequisite</b>	The <b>Pulse</b> option is selected in the <b>Operating mode</b> parameter (→ 114) parameter.
<b>Description</b>	Displays the pulse frequency currently output.
<b>User interface</b>	Positive floating-point number
<b>Additional information</b>	<p><i>Description</i></p> <ul style="list-style-type: none"> <li>■ The pulse output is an open collector output.</li> <li>■ 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.</li> </ul>



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 (→ 132) 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 (→ 118)) can be configured.

---

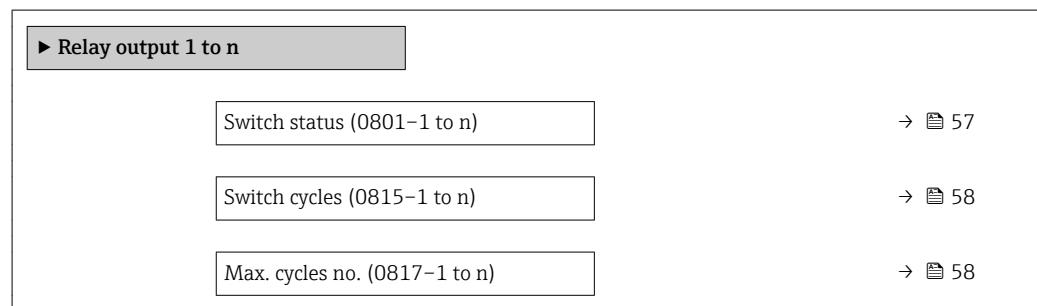
## Switch status 1 to n

---

<b>Navigation</b>	Expert → Sensor → Measured val. → Output values → 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 (→ 114).
<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>

"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

### 3.2.2 "System units" submenu

*Navigation*        Expert → Sensor → System units

 <b>System units</b>	
Mass flow unit (0554)	→  59
Mass unit (0574)	→  59
Volume flow unit (0553)	→  60
Volume unit (0563)	→  61
Cor.volflow unit (0558)	→  62
Corr. vol. unit (0575)	→  62
Density unit (0555)	→  63
Ref. dens. unit (0556)	→  64
Temperature unit (0557)	→  64

Pressure unit (0564)	→ <a href="#">65</a>
Date/time format (2812)	→ <a href="#">66</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

#### SI units

- g/s
- g/min
- g/h
- g/d
- kg/s
- kg/min
- kg/h
- kg/d
- t/s
- t/min
- t/h
- t/d

#### US units

- oz/s
- oz/min
- oz/h
- oz/d
- lb/s
- lb/min
- lb/h
- lb/d
- STon/s
- STon/min
- STon/h
- STon/d

### Factory setting

Country-specific:

- kg/h
- lb/min

### Additional information

#### Result

The selected unit applies for:

- **Target mass flow** parameter (→ [49](#))
- **Carrier mass fl.** parameter (→ [49](#))
- **Mass flow** parameter (→ [46](#))

#### Selection

For an explanation of the abbreviated units: → [267](#)

## 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
- kg
- t

#### US units

- oz
- lb
- STon

**Factory setting**

Country-specific:

- kg
- lb

**Additional information***Selection*

For an explanation of the abbreviated units: → 267

**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***SI units*

- cm<sup>3</sup>/s
- cm<sup>3</sup>/min
- cm<sup>3</sup>/h
- cm<sup>3</sup>/d
- dm<sup>3</sup>/s
- dm<sup>3</sup>/min
- dm<sup>3</sup>/h
- dm<sup>3</sup>/d
- m<sup>3</sup>/s
- m<sup>3</sup>/min
- m<sup>3</sup>/h
- m<sup>3</sup>/d
- ml/s
- ml/min
- ml/h
- ml/d
- l/s
- l/min
- l/h
- l/d
- hl/s
- hl/min
- hl/h
- hl/d
- Ml/s
- Ml/min
- Ml/h
- Ml/d

*US units*

- af/s
- af/min
- af/h
- af/d
- ft<sup>3</sup>/s
- ft<sup>3</sup>/min
- ft<sup>3</sup>/h
- ft<sup>3</sup>/d
- fl oz/s (us)
- fl oz/min (us)
- fl oz/h (us)
- fl oz/d (us)
- gal/s (us)
- gal/min (us)
- gal/h (us)
- gal/d (us)
- kgal/s (us)
- kgal/min (us)
- kgal/h (us)
- kgal/d (us)
- Mgal/s (us)
- Mgal/min (us)
- Mgal/h (us)
- Mgal/d (us)
- 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)

*Imperial units*

- gal/s (imp)
- gal/min (imp)
- gal/h (imp)
- gal/d (imp)
- Mgal/s (imp)
- Mgal/min (imp)
- Mgal/h (imp)
- Mgal/d (imp)
- bbl/s (imp;oil)
- bbl/min (imp;oil)
- bbl/h (imp;oil)
- bbl/d (imp;oil)

or

- US units*
- bbl/s (us;liq.) \*
  - bbl/min (us;liq.) \*
  - bbl/h (us;liq.) \*
  - bbl/d (us;liq.) \*
  - bbl/s (us;beer) \*
  - bbl/min (us;beer) \*
  - bbl/h (us;beer) \*
  - bbl/d (us;beer) \*

- Imperial units*
- bbl/s (imp;beer) \*
  - bbl/min (imp;beer) \*
  - bbl/h (imp;beer) \*
  - bbl/d (imp;beer)

\* Visibility depends on order options or device settings

#### Factory setting

Country-specific:

- l/h
- gal/min (us)

#### Additional information

##### *Result*

The selected unit applies for:

**Volume flow parameter** (→  47)

##### *Selection*

 For an explanation of the abbreviated units: →  267

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

##### *US units*

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

##### *Imperial units*

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

or

##### *US units*

- bbl (us;liq.) \*
- bbl (us;beer) \*

##### *Imperial units*

- bbl (imp;beer) \*

\* Visibility depends on order options or device settings

#### Factory setting

Country-specific:

- l
- gal (us)

**Additional information***Selection*

For an explanation of the abbreviated units: → [267](#)

**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*

- Nl/s
- Nl/min
- Nl/h
- Nl/d
- Nm<sup>3</sup>/s
- Nm<sup>3</sup>/min
- Nm<sup>3</sup>/h
- Nm<sup>3</sup>/d
- Sm<sup>3</sup>/s
- Sm<sup>3</sup>/min
- Sm<sup>3</sup>/h
- Sm<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.)

*Imperial units*

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

**Factory setting**

Country-specific:

- Nl/h
- Sft<sup>3</sup>/min

**Additional information***Result*

The selected unit applies for:

**Correct.vol.flow** parameter (→ [47](#))

*Selection*

For an explanation of the abbreviated units: → [267](#)

**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***SI units*

- Nl
- Nm<sup>3</sup>
- Sm<sup>3</sup>

*US units*

- Sft<sup>3</sup>
- Sgal (us)
- Sbbl (us;liq.)

*Imperial units*

- Sgal (imp)

**Factory setting**

Country-specific:

- Nl
- Sft<sup>3</sup>

**Additional information***Selection*

For an explanation of the abbreviated units: → [267](#)

**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>
- g/ml
- 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;oil)
- lb/bbl (us;tank)

*Imperial units*

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

*US units*  
SG60°F \**Other units*  
°API \*

\* Visibility depends on order options or device settings

or

*US units*  
■ lb/bbl (us;liq.) \*  
■ lb/bbl (us;beer) \**Imperial units*  
lb/bbl (imp;beer) \*

\* Visibility depends on order options or device settings

**Factory setting**

Country-specific:

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

**Additional information***Result*

The selected unit applies for:

- **Density setpt 1** parameter
- **Density setpt 2** parameter
- **Density** parameter (→ [47](#))

*Selection*

- SD = specific density

The specific density is the ratio of the medium density to the water density at a water temperature of +4 °C (+39 °F), +15 °C (+59 °F), +20 °C (+68 °F).

- SG = specific gravity

The specific gravity is the ratio of the medium density to the water density at a water temperature of +4 °C (+39 °F), +15 °C (+59 °F), +20 °C (+68 °F).

 For an explanation of the abbreviated units: → [267](#)

**Ref. dens. unit****Navigation**

  Expert → Sensor → System units → Ref. dens. unit (0556)

**Description**

Use this function to select the unit for the reference density.

**Selection***SI units*

- kg/Nm<sup>3</sup>
- kg/Nl
- g/Scm<sup>3</sup>
- kg/Sm<sup>3</sup>
- RD15°C
- RD20°C

*US units*

- lb/Sft<sup>3</sup>
- RD60°F

*Other units*

°APIbase

**Factory setting**

Country-dependent

- kg/Nl
- lb/Sft<sup>3</sup>

**Additional information***Result*

The selected unit applies for:

- **Ext. ref.density** parameter (→ [80](#))
- **Fix ref.density** parameter (→ [80](#))
- **Ref.density** parameter (→ [48](#))

*Selection*

 For an explanation of the abbreviated units: → [267](#)

**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>
	<ul style="list-style-type: none"> <li>▪ °C</li> <li>▪ K</li> </ul>	<ul style="list-style-type: none"> <li>▪ °F</li> <li>▪ °R</li> </ul>
Factory setting	Country-specific:	

Factory setting	Country-specific:
	<ul style="list-style-type: none"> <li>▪ °C</li> <li>▪ °F</li> </ul>

Additional information	<i>Result</i>
	The selected unit applies for:
	<ul style="list-style-type: none"> <li>▪ <b>Maximum value</b> parameter (→ 239)</li> <li>▪ <b>Minimum value</b> parameter (→ 240)</li> <li>▪ <b>Maximum value</b> parameter (→ 240)</li> <li>▪ <b>Minimum value</b> parameter (→ 240)</li> <li>▪ <b>Maximum value</b> parameter (→ 241)</li> <li>▪ <b>Minimum value</b> parameter (→ 241)</li> <li>▪ <b>External temp.</b> parameter (→ 78)</li> <li>▪ <b>Temperature</b> parameter (→ 48)</li> <li>▪ <b>Ref. temperature</b> parameter (→ 80)</li> </ul>
	<i>Selection</i>

**Selection**

 For an explanation of the abbreviated units: → 267

**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>
	<ul style="list-style-type: none"> <li>▪ Pa a</li> <li>▪ kPa a</li> <li>▪ MPa a</li> <li>▪ bar</li> <li>▪ Pa g</li> <li>▪ kPa g</li> <li>▪ MPa g</li> <li>▪ bar g</li> </ul>	<ul style="list-style-type: none"> <li>▪ psi a</li> <li>▪ psi g</li> </ul>
Factory setting	Country-specific:	
	<ul style="list-style-type: none"> <li>▪ bar a</li> <li>▪ psi a</li> </ul>	

Additional information	<i>Result</i>
	The unit is taken from:
	<ul style="list-style-type: none"> <li>▪ <b>Pressure value</b> parameter (→ 77)</li> <li>▪ <b>External press.</b> parameter (→ 77)</li> <li>▪ <b>Pressure value</b> parameter (→ 48)</li> </ul>
	<i>Selection</i>

 For an explanation of the abbreviated units: → 267

**Date/time format****Navigation**

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: → [267](#)

**3.2.3 "Process param." submenu****Navigation**

Expert → Sensor → Process param.

► Process param.	
Flow damping (1802)	→ <a href="#">66</a>
Density damping (1803)	→ <a href="#">67</a>
Temp. damping (1822)	→ <a href="#">67</a>
Flow override (1839)	→ <a href="#">68</a>
► Low flow cut off	→ <a href="#">68</a>
► Partial pipe det	→ <a href="#">71</a>

**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 100.0 s

**Factory setting** 0 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
- Low flow cut off →  68
- Totalizers →  206

## Density damping



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

**Description** Use this function to enter a time constant for the damping (PT1 element) of the density measured value.

**User entry** 0 to 999.9 s

**Factory setting** 0 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).

## Temp. damping



**Navigation**   Expert → Sensor → Process param. → Temp. damping (1822)

**Description** Use this function to enter a time constant for the damping (PT1 element) of the temperature measured value.

2) Proportional behavior with first-order lag

3) Proportional behavior with first-order lag

**User entry** 0 to 999.9 s

**Factory setting** 0 s

**Additional information** *Description*

**i** The damping is performed by a PT1 element<sup>4)</sup>.

*User entry*

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

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

## 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

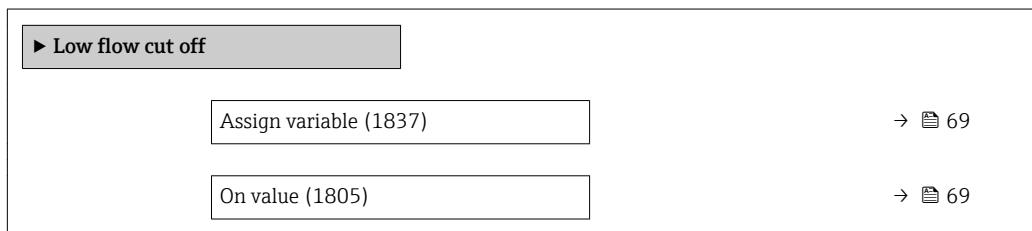
- The diagnostic message diagnostic message **△C453 Flow override** is displayed.
- Output values
  - Temperature: continues to be output
  - Totalizers 1-3: stop being totalized

**i** The **Flow override** option can also be activated in the **Status input** submenu: **Assign stat.inp.** parameter (→ 96).

## "Low flow cut off" submenu

**Navigation**

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



4) Proportional behavior with first-order lag

Off value (1804)	→ <a href="#">69</a>
Pres. shock sup. (1806)	→ <a href="#">70</a>

**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
- Mass flow
- Volume flow
- Correct.vol.flow \*

**Factory setting** Mass 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 (→ [69](#)).

**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 → [69](#).

**User entry** Positive floating-point number

**Factory setting** Depends on country and nominal diameter → [265](#)

**Additional information**

*Dependency*

The unit depends on the process variable selected in the **Assign variable** parameter (→ [69](#)).

**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 (→ [69](#)).

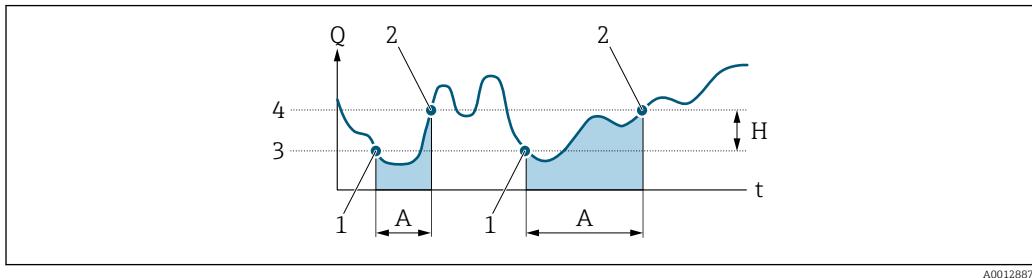
**Description** Use this function to enter a switch-off value for low flow cut off. The off value is entered as a positive hysteresis from the on value → [69](#).

\* Visibility depends on order options or device settings

**User entry** 0 to 100.0 %

**Factory setting** 50 %

**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

## Pres. shock sup.



**Navigation** Expert → Sensor → Process param. → Low flow cut off → Pres. shock sup. (1806)

**Prerequisite** A process variable is selected in the **Assign variable** parameter (→ 69).

**Description** Use this function to enter the time interval for signal suppression (= active pressure shock suppression).

**User entry** 0 to 100 s

**Factory setting** 0 s

**Additional information** *Description*

### Pressure shock suppression is enabled

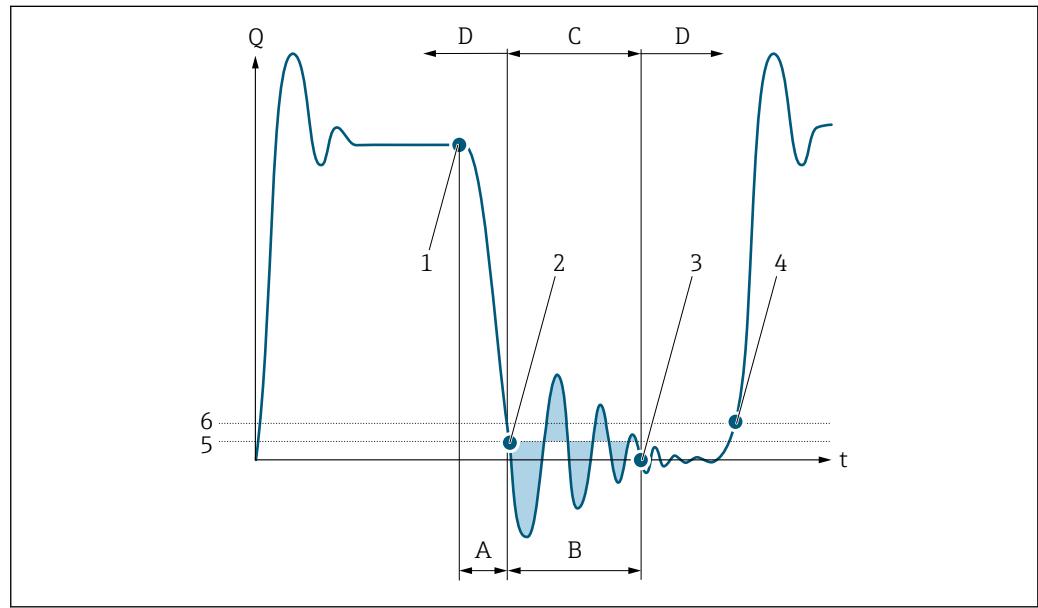
- Prerequisite:
  - Flow rate < on-value of low flow cut off
  - or
  - Changing the flow direction
- Output values
  - Flow displayed: 0
  - Totalizer: the totalizers are pegged at the last correct value

**Pressure shock suppression is disabled**

- Prerequisite: the time interval set in this function has elapsed.
- If the flow also exceeds the switch-off value for low flow cut off, the device starts processing the current flow value again and displays it.

*Example*

When closing a valve, momentarily strong fluid movements may occur in the pipeline, which are registered by the measuring system. These totalized flow values lead to a false totalizer status, particularly during batching processes.



A0012888

- Q Flow  
 t Time  
 A Drip  
 B Pressure shock  
 C Pressure shock suppression active as specified by the time entered  
 D Pressure shock suppression inactive  
 1 Valve closes  
 2 Flow falls below the on-value of the low flow cut off: pressure shock suppression is activated  
 3 The time entered has elapsed: pressure shock suppression is deactivated  
 4 The actual flow value is now displayed and output  
 5 On-value for low flow cut off  
 6 Off-value for low flow cut off

**"Partial pipe det" submenu***Navigation*

Expert → Sensor → Process param. → Partial pipe det

<b>► Partial pipe det</b>	
Assign variable (1860)	→  72
Low value (1861)	→  72
High value (1858)	→  73

Response time (1859)	→  73
Max. damping (6040)	→  73

## Assign variable



### Navigation

Expert → Sensor → Process param. → Partial pipe det → Assign variable (1860)

### Description

Use this function to select a process variable to detect empty or partially filled measuring tubes.

For gas measurement: Deactivate monitoring due to low gas density.

### Selection

- Off
- Density
- Ref.density

### Factory setting

Off

## Low value



### Navigation

Expert → Sensor → Process param. → Partial pipe det → Low value (1861)

### Prerequisite

A process variable is selected in the **Assign variable** parameter (→ 72).

### Description

Use this function to enter a lower limit value to enable detection of empty or partially filled measuring tubes. If the measured density falls below this value, monitoring is enabled.

### User entry

Signed floating-point number

### Factory setting

200

### Additional information

*User entry*

The lower limit value must be less than the upper limit value defined in the **High value** parameter (→ 73).

The unit depends on the process variable selected in the **Assign variable** parameter (→ 72).

*Limit value*

If the displayed value is outside the limit value, the measuring device displays the diagnostic message **△S862 Partly filled**.

**High value**

**Navigation** Expert → Sensor → Process param. → Partial pipe det → High value (1858)

**Prerequisite** A process variable is selected in the **Assign variable** parameter (→ 72).

**Description** Use this function to enter an upper limit value to enable detection of empty or partially filled measuring tubes. If the measured density exceeds this value, detection is enabled.

**User entry** Signed floating-point number

**Factory setting** 6 000

**Additional information** *User entry*

The upper limit value must be greater than the lower limit value defined in the **Low value** parameter (→ 72).

The unit depends on the process variable selected in the **Assign variable** parameter (→ 72).

*Limit value*

If the displayed value is outside the limit value, the measuring device displays the diagnostic message **△S862 Partly filled**.

**Response time**

**Navigation** Expert → Sensor → Process param. → Partial pipe det → Response time (1859)

**Prerequisite** A process variable is selected in the **Assign variable** parameter (→ 72).

**Description** Use this function to enter the minimum length of time (debouncing time) the signal must be present for the diagnostic message **△S862 Partly filled** to be triggered if the measuring pipe is empty or partially full.

**User entry** 0 to 100 s

**Factory setting** 1 s

**Max. damping**

**Navigation** Expert → Sensor → Process param. → Partial pipe det → Max. damping (6040)

**Description** Use this function to enter a damping value to enable detection of empty or partially filled measuring tubes.

**User entry** Positive floating-point number

**Factory setting** 0

**Additional information****Description**

If oscillation damping exceeds the specified value, the measuring device presumes that the pipe is partially filled and the flow signal is set to **0**. The measuring device displays the diagnostic message **△S862 Partly filled**. In the case of non-homogeneous media or air pockets, the damping of the measuring tubes increases.

**User entry**

- Damping is disabled if **0** is entered (factory setting).
- Damping is enabled if the value entered is greater than **0**.
- The value entered depends on application-specific influence variables, such as the medium, nominal diameter, sensor etc.

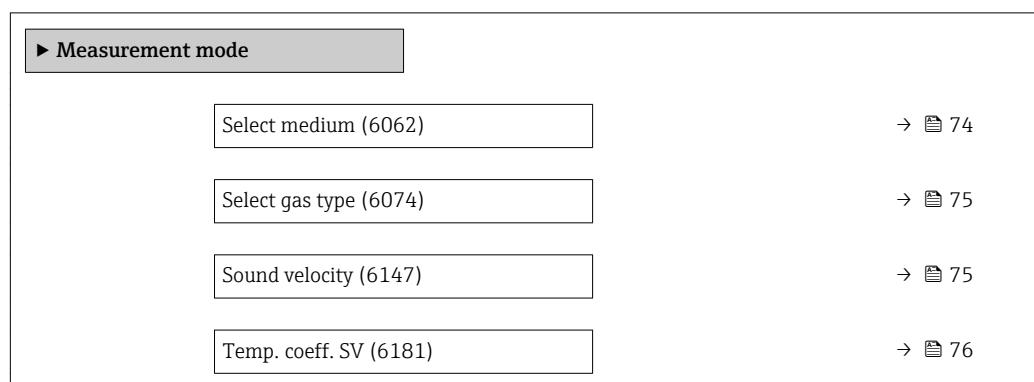
**Example**

- If the pipe is filled normally the value of the oscillation damping is 500.
- If the pipe is partially filled the value of the oscillation damping is > 5000.
- A practical damping value would then be 2000: enter 2000 as the value.

### 3.2.4 "Measurement mode" submenu

**Navigation**

Expert → Sensor → Measurement mode



#### Select medium

**Navigation**

Expert → Sensor → Measurement mode → Select medium (6062)

**Description**

Use this function to select the type of medium.

**Selection**

- Liquid
- Gas

**Factory setting**

Liquid

---

**Select gas type**

**Navigation** Expert → Sensor → Measurement mode → Select gas type (6074)

**Prerequisite** The **Gas** option is selected in the **Select medium** parameter (→ 74).

**Description** Use this function to select the type of gas for the measuring application.

**Selection**

- Air
- Ammonia NH<sub>3</sub>
- Argon Ar
- Sulf. hex.fl.SF<sub>6</sub>
- Oxygen O<sub>2</sub>
- Ozone O<sub>3</sub>
- Nitrog. ox. NO<sub>x</sub>
- Nitrogen N<sub>2</sub>
- Nitrous ox. N<sub>2</sub>O
- Methane CH<sub>4</sub>
- Hydrogen H<sub>2</sub>
- Helium He
- Hydrog.chlor.HCl
- Hydrog.sulf. H<sub>2</sub>S
- Ethylene C<sub>2</sub>H<sub>4</sub>
- Carbon diox. CO<sub>2</sub>
- Carbon monox. CO
- Chlorine Cl<sub>2</sub>
- Butane C<sub>4</sub>H<sub>10</sub>
- Propane C<sub>3</sub>H<sub>8</sub>
- Propylene C<sub>3</sub>H<sub>6</sub>
- Ethane C<sub>2</sub>H<sub>6</sub>
- Others

**Factory setting** Methane CH<sub>4</sub>

**Additional information** *Description*

The gas type needs to be selected so that it is possible to comply with accuracy specifications in gas applications.

---

**Sound velocity**

**Navigation** Expert → Sensor → Measurement mode → Sound velocity (6147)

**Prerequisite** In the **Select gas type** parameter (→ 75), the **Others** option is selected.

**Description** Use this function to enter the sound velocity of the gas at 0 °C (+32 °F).

**User entry** 1 to 99 999.9999 m/s

**Factory setting** 415.0 m/s

**Temp. coeff. SV****Navigation**

Expert → Sensor → Measurement mode → Temp. coeff. SV (6181)

**Prerequisite**

The **Others** option is selected in the **Select gas type** parameter (→ [75](#)).

**Description**

Use this function to enter a temperature coefficient for the sound velocity of the gas.

**User entry**

Positive floating-point number

**Factory setting**

0 (m/s)/K

**3.2.5 "External comp." submenu***Navigation*

Expert → Sensor → External comp.

External comp.	
Pressure compen. (6130)	→ <a href="#">76</a>
Pressure value (6059)	→ <a href="#">77</a>
External press. (6209)	→ <a href="#">77</a>
Temp.corr.source (6184)	→ <a href="#">78</a>
External temp. (6080)	→ <a href="#">78</a>

**Pressure compen.****Navigation**

Expert → Sensor → External comp. → Pressure compen. (6130)

**Description**

Use this function to select the type of pressure compensation.

**Selection**

- Off
- Fixed value
- External value
- Current input 1 \*
- Current input 3 \*

**Factory setting**

Off

\* Visibility depends on order options or device settings

**Additional information***Selection*

- Fixed value  
A fixed pressure value is used for compensation: **Pressure value** parameter (→ 77)
- External value  
The pressure value read in via PROFIBUS PA is used for compensation.
- **Current input 1** option, **Current input 3** option  
The pressure value read in via the current input is used for compensation.



For more information, see the "Cyclic data transmission" section of the Operating Instructions

**Pressure value****Navigation**

Expert → Sensor → External comp. → Pressure value (6059)

**Prerequisite**

The **Fixed value** option or the **Current input 1...n** option is selected in the **Pressure compen.** parameter (→ 76).

**Description**

Use this function to enter a value for the process pressure that is used for pressure correction.

**User entry**

Positive floating-point number

**Factory setting**

0 bar

**Additional information***User entry*

The unit is taken from the **Pressure unit** parameter (→ 65)

**External press.****Navigation**

Expert → Sensor → External comp. → External press. (6209)

**Prerequisite**

The **Fixed value** option or the **Current input 1...n** option is selected in the **Pressure compen.** parameter (→ 76).

**Description**

Use this function to enter an external pressure value.

**User interface**

Positive floating-point number

**Factory setting**

0 bar

**Additional information***User entry*

The unit is taken from the **Pressure unit** parameter (→ 65)

**Temp.corr.source****Navigation**

Expert → Sensor → External comp. → Temp.corr.source (6184)

**Description**

Use this function to select the temperature mode.

**Selection**

- Internal value
- External value
- Current input 1 \*

**Factory setting**

Internal value

**Additional information***Description*

Use this function to select the type of temperature compensation.

*Selection*

All the options available for selection are used for measured value compensation.

- Internal value  
The temperature value measured internally (temperature sensor of the measuring sensor) is used for compensation.
- External value  
The temperature value read in via PROFIBUS PA is used for compensation.
- **Current input 1** optionVisibility depends on order options or device settings  
The temperature value read in via the current input is used for compensation.

For more information, see the "Cyclic data transmission" section of the Operating Instructions

---

**External temp.****Navigation**

Expert → Sensor → External comp. → External temp. (6080)

**Prerequisite**The **External value** option or the **Current input 1...n** option is selected in the **Temperature mode** parameter (→ 78).**Description**

Use this function to enter the external temperature.

**User interface**

-273.15 to 99 999 °C

**Factory setting**

Country-specific:

- 0 °C
- +32 °F

**Additional information***Description* The unit is taken from the **Temperature unit** parameter (→ 64)

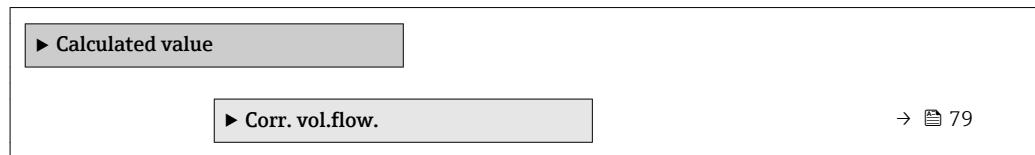
---

\* Visibility depends on order options or device settings

### 3.2.6 "Calculated value" submenu

*Navigation*

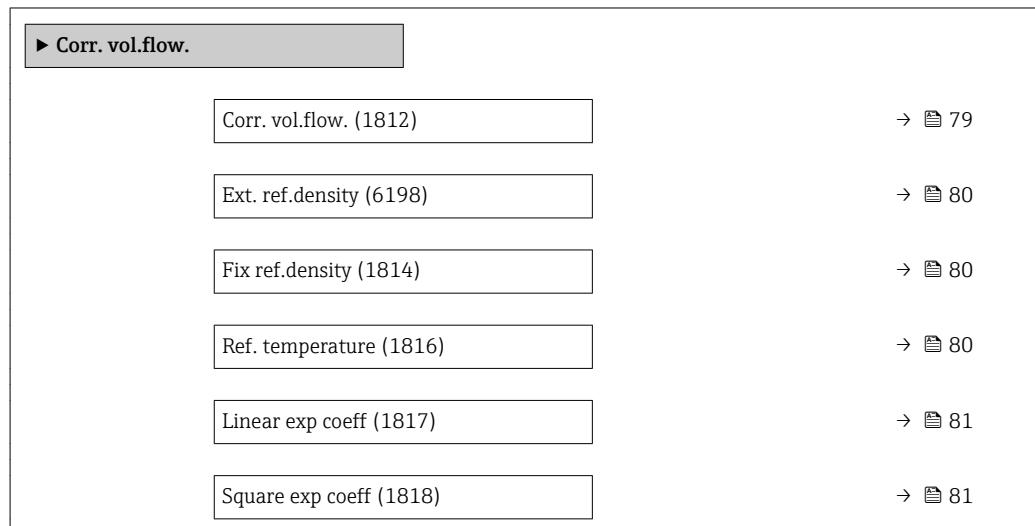
Expert → Sensor → Calculated value



#### "Corr. vol.flow." submenu

*Navigation*

Expert → Sensor → Calculated value → Corr. vol.flow.



## Corr. vol.flow.



**Navigation**

Expert → Sensor → Calculated value → Corr. vol.flow. → Corr. vol.flow. (1812)

**Description**

Use this function to select the reference density for calculating the corrected volume flow.

**Selection**

- Fix ref.density
- Calc ref density
- Ext. ref.density
- Current input 1 \*
- Current input 3 \*

**Factory setting**

Calc ref density

**Additional information**

*Selection*

The **Ref. dens API 53** option is suitable only for applications involving LPG<sup>5)</sup>, where the flow rate is measured on the basis of the corrected volume flow.

Selecting this option means that the reference density is used, taking into account the values in table 53 E of API MPMS section 11.2. Temperature measurement (measured

\* Visibility depends on order options or device settings  
5) liquefied petroleum gas

internally or read into the device from an external source (→ 76 → 76) and density measurement take place during operation while the medium is flowing. The mass flow is divided by the reference density to give the corrected volume flow and is issued as an output signal.

---

## Ext. ref.density

---

<b>Navigation</b>	  Expert → Sensor → Calculated value → Corr. vol.flow. → Ext. ref.density (6198)
<b>Description</b>	Displays the reference density which is read in externally, e.g. via the current input.
<b>User interface</b>	Floating point number with sign
<b>Additional information</b>	<i>Dependency</i>
	 The unit is taken from the <b>Ref. dens. unit</b> parameter (→ 64)

---

## Fix ref.density

---

<b>Navigation</b>	  Expert → Sensor → Calculated value → Corr. vol.flow. → Fix ref.density (1814)
<b>Prerequisite</b>	The <b>Fix ref.density</b> option is selected in the <b>Corr. vol.flow.</b> parameter (→ 79) parameter.
<b>Description</b>	Use this function to enter a fixed value for the reference density.
<b>User entry</b>	Positive floating-point number
<b>Factory setting</b>	1 kg/Nl
<b>Additional information</b>	<i>Dependency</i>
	 The unit is taken from the <b>Ref. dens. unit</b> parameter (→ 64)

---

## Ref. temperature

---

<b>Navigation</b>	  Expert → Sensor → Calculated value → Corr. vol.flow. → Ref. temperature (1816)
<b>Prerequisite</b>	The <b>Calc ref density</b> option is selected in the <b>Corr. vol.flow.</b> parameter (→ 79) parameter.
<b>Description</b>	Use this function to enter a reference temperature for calculating the reference density.
<b>User entry</b>	-273.15 to 99 999 °C

**Factory setting**

Country-specific:

- +20 °C
- +68 °F

**Additional information***Dependency*

 The unit is taken from the **Temperature unit** parameter (→ 64)

*Reference density calculation*

$$\rho_a = \rho \cdot (1 + \alpha \cdot \Delta t + \beta \cdot \Delta t^2)$$

A0023403

- $\rho_N$ : reference density
- $\rho$ : fluid density currently measured
- $t$ : fluid temperature currently measured
- $t_N$ : reference temperature at which the reference density is calculated (e.g. 20 °C)
- $\Delta t$ :  $t - t_N$
- $\alpha$ : linear expansion coefficient of the fluid, unit = [1/K]; K = Kelvin
- $\beta$ : square expansion coefficient of the fluid, unit = [1/K<sup>2</sup>]

**Linear exp coeff****Navigation**

 Expert → Sensor → Calculated value → Corr. vol.flow. → Linear exp coeff (1817)

**Prerequisite**

The **Calc ref density** option is selected in the **Corr. vol.flow.** parameter (→ 79) parameter.

**Description**

Use this function to enter a linear, fluid-specific expansion coefficient for calculating the reference density.

**User entry**

Signed floating-point number

**Factory setting**

0.0 1/K

**Square exp coeff****Navigation**

 Expert → Sensor → Calculated value → Corr. vol.flow. → Square exp coeff (1818)

**Prerequisite**

The **Calc ref density** option is selected in the **Corr. vol.flow.** parameter (→ 79) parameter.

**Description**

For fluid with a non-linear expansion pattern: use this function to enter a quadratic, fluid-specific expansion coefficient for calculating the reference density.

**User entry**

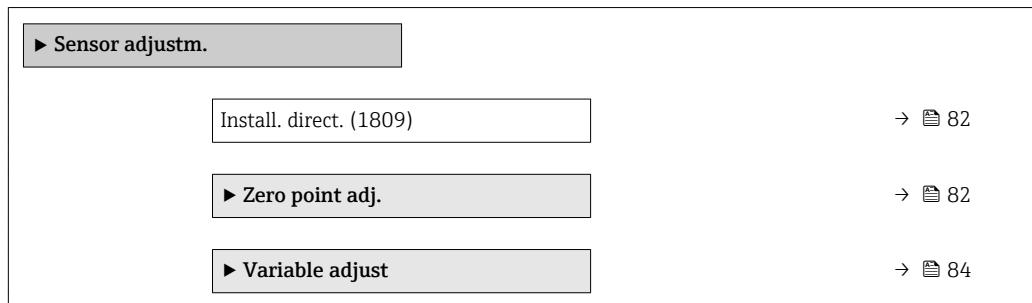
Signed floating-point number

**Factory setting**0.0 1/K<sup>2</sup>

### 3.2.7 "Sensor adjustment" submenu

Navigation

Expert → Sensor → Sensor adjustm.



#### 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.

#### "Zero point adj." submenu

- It is generally not necessary to perform zero point adjustment.
- However, this function may be needed in some applications with low flow and strict accuracy requirements.
- A zero point adjustment cannot increase repeatability.
- The following conditions should be met to perform a zero point adjustment successfully without the adjustment finishing in an error:
- The real flow must be **0**.
  - The pressure must be at least 15 psi g.
- The adjustment takes a maximum of 60 s. The more stable the conditions, the faster the adjustment is completed.
- This function can also be used to check the health of the measuring device. A healthy measuring device has a maximum zero point deviation of ±100 compared to the factory setting of the measuring device (calibration report).

*Navigation*

  Expert → Sensor → Sensor adjustm. → Zero point adj.

 ▶ Zero point adj.

Zero point adj. (6196)

→  83

Progress (2808)

→  83

**Zero point adj.****Navigation**

 Expert → Sensor → Sensor adjustm. → Zero point adj. → Zero point adj. (6196)

 Expert → Sensor → Sensor adjustm. → Zero point adj. → Zero point adj. (6196)

**Description**

Use this function to select the start of the zero point adjustment.

 Observe conditions →  82.

**Selection**

- Cancel
- Busy \*
- Zero adjust fail \*
- Start

**Factory setting**

Cancel

**Additional information***Description*

- Cancel  
If zero point adjustment has failed, select this option to cancel zero point adjustment.
- Busy  
Is displayed during zero point adjustment.
- Zero adjust fail  
Is displayed if zero point adjustment has failed.
- Start  
Select this option to start zero point adjustment.

**Progress****Navigation**

  Expert → Sensor → Sensor adjustm. → Zero point adj. → Progress (2808)

**Description**

The progress of the process is indicated.

**User interface**

0 to 100 %

\* Visibility depends on order options or device settings

**"Variable adjust" submenu***Navigation*
 Expert → Sensor → Sensor adjustm. → Variable adjust

► Variable adjust	
Mass flow offset (1831)	→  84
Mass flow factor (1832)	→  85
Vol. flow offset (1841)	→  85
Vol. flow factor (1846)	→  85
Density offset (1848)	→  86
Density factor (1849)	→  86
Corr. vol offset (1866)	→  86
Corr. vol factor (1867)	→  87
Ref.dens. offset (1868)	→  87
Ref.dens. factor (1869)	→  87
Temp. offset (1870)	→  88
Temp. factor (1871)	→  88

**Mass flow offset****Navigation**
 Expert → Sensor → Sensor adjustm. → Variable adjust → Mass flow offset (1831)
**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/s.

**User entry**

Signed floating-point number

**Factory setting**

0 kg/s

**Additional information***Description*

 Corrected value = (factor × value) + offset

**Mass flow factor**

<b>Navigation</b>	Expert → Sensor → Sensor adjustm. → Variable adjust → Mass flow factor (1832)
<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
<b>Additional information</b>	<i>Description</i> Corrected value = (factor × value) + offset

**Vol. flow offset**

<b>Navigation</b>	Expert → Sensor → Sensor adjustm. → Variable adjust → Vol. flow offset (1841)
<b>Description</b>	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.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	0 m <sup>3</sup> /s
<b>Additional information</b>	<i>Description</i> Corrected value = (factor × value) + offset

**Vol. flow factor**

<b>Navigation</b>	Expert → Sensor → Sensor adjustm. → Variable adjust → Vol. flow factor (1846)
<b>Description</b>	Use this function to enter a quantity factor (without time) for the volume flow. This multiplication factor is applied over the volume flow range.
<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

**Density offset**

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

**Description** Use this function to enter the zero point shift for the density trim. The density unit on which the shift is based is kg/m<sup>3</sup>.

**User entry** Signed floating-point number

**Factory setting** 0 kg/m<sup>3</sup>

**Additional information** *Description*

Corrected value = (factor × value) + offset

**Density factor**

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

**Description** Use this function to enter a quantity factor for the density. This multiplication factor is applied over the density 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 (1866)

**Description** Use this function to enter the zero point shift for the corrected volume flow trim. The corrected volume flow unit on which the shift is based is 1 Nm<sup>3</sup>/s.

**User entry** Signed floating-point number

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

**Additional information** *Description*

Corrected value = (factor × value) + offset

---

**Corr. vol factor**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol factor (1867)

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

**User entry** Positive floating-point number

**Factory setting** 1

**Additional information** *Description*

Corrected value = (factor × value) + offset

---

**Ref.dens. offset**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Ref.dens. offset (1868)

**Description** Use this parameter to enter the zero point shift for the reference density trim. The reference density unit on which the shift is based is 1 kg/Nm<sup>3</sup>.

**User entry** Signed floating-point number

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

**Additional information** *Description*

Corrected value = (factor × value) + offset

---

**Ref.dens. factor**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Ref.dens. factor (1869)

**Description** Use this function to enter a quantity factor (without time) for the reference density. This multiplication factor is applied over the reference density 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****Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Temp. factor (1871)

**Description**

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

**User entry**

Positive floating-point number

**Factory setting**

1

**Additional information****Description**

Corrected value = (factor × value) + offset

### 3.2.8 "Calibration" submenu

**Navigation**

Expert → Sensor → Calibration

► Calibration

Cal. factor (6025)	→  89
Zero point (6195)	→  89
Nominal diameter (2807)	→  89
C0 to 5 (6022)	→  89

---

**Cal. factor**

---

**Navigation**   Expert → Sensor → Calibration → Cal. factor (6025)

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

**User interface** Signed floating-point number

**Factory setting** Depends on nominal diameter and calibration.

---

**Zero point**

---



**Navigation**   Expert → Sensor → Calibration → Zero point (6195)

**Description** Use this function to enter the zero point correction value for the sensor.

**User entry** Signed floating-point number

**Factory setting** Depends on nominal diameter and calibration.

---

**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.

---

**C0 to 5**

---

**Navigation**   Expert → Sensor → Calibration → C0 to 5 (6022)

**Description** Displays the current density coefficients C0 to 5 of the sensor.

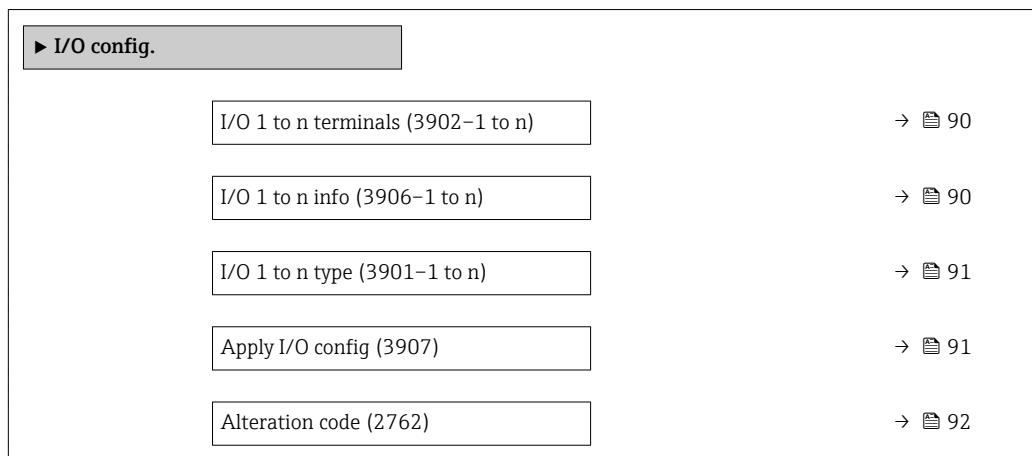
**User interface** Signed floating-point number

**Factory setting** 0

### 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)

---

#### 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
- Profibus PA

<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>"Profibus PA"</i> option The I/O module is configured for PROFIBUS PA.</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: "Output; input 2", option <b>D</b> "Configurable I/O initial setting off"
<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> </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

**Alteration code****Navigation**

Expert → I/O config. → Alteration 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

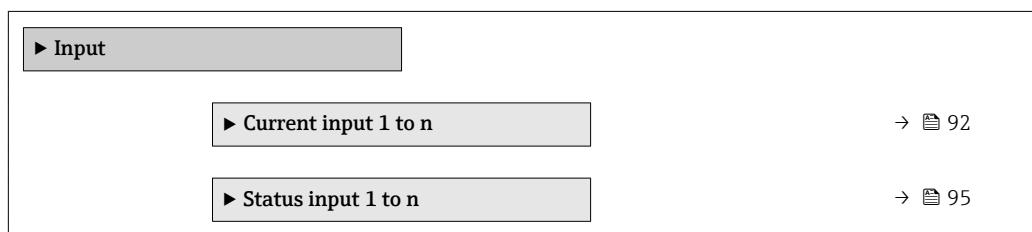
**Additional information***Description*

The I/O configuration is changed in the **I/O type** parameter (→ 91).

## 3.4 "Input" submenu

*Navigation*

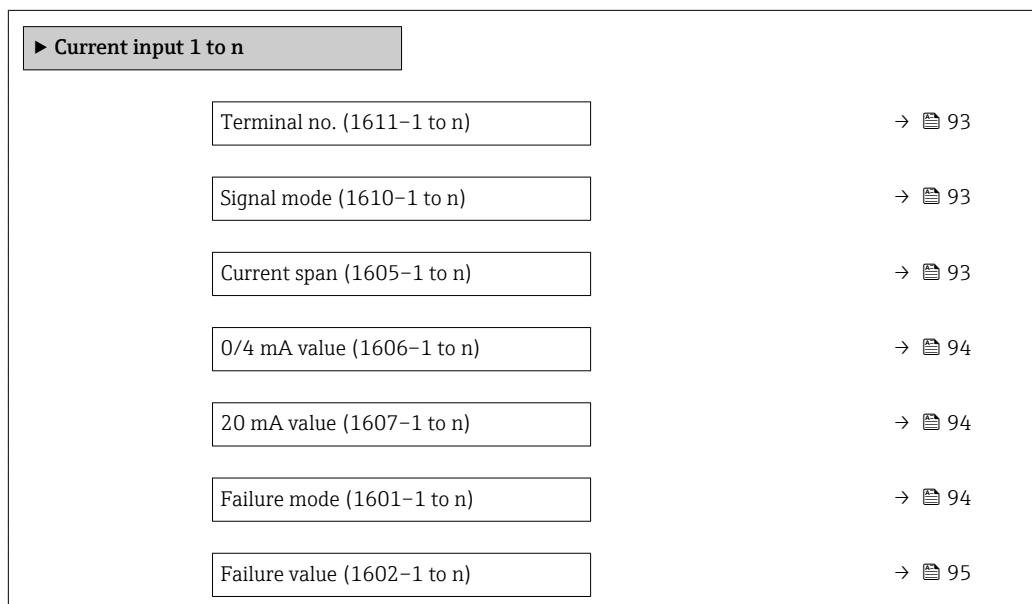
Expert → Input



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

*Navigation*

Expert → Input → Current input 1 to n



**Terminal no.**

<b>Navigation</b>	  Expert → Input → Current input 1 to n → Terminal no. (1611–1 to n)
<b>Description</b>	Displays the terminal numbers used by the current input module.
<b>User interface</b>	<ul style="list-style-type: none"> <li>■ Not used</li> <li>■ 24-25 (I/O 2)</li> </ul>
<b>Additional information</b>	<p><i>"Not used" option</i></p> <p>The current input module does not use any terminal numbers.</p>

**Signal mode**

<b>Navigation</b>	  Expert → Input → Current input 1 to n → Signal mode (1610–1 to n)
<b>Prerequisite</b>	The measuring device is <b>not</b> approved for use in the hazardous area with type of protection Ex-i.
<b>Description</b>	Use this function to select the signal mode for the current input.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Passive</li> <li>■ Active *</li> </ul>
<b>Factory setting</b>	Active

**Current span**

<b>Navigation</b>	  Expert → Input → Current input 1 to n → Current span (1605–1 to n)
<b>Description</b>	Use this function to select the current range for the process value output and the upper and lower level for signal on alarm.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ 4...20 mA</li> <li>■ 4...20 mA NAMUR</li> <li>■ 4...20 mA US</li> <li>■ 0...20 mA</li> </ul>
<b>Factory setting</b>	Country-specific: <ul style="list-style-type: none"> <li>■ 4...20 mA NAMUR</li> <li>■ 4...20 mA US</li> </ul>
<b>Additional information</b>	<p><i>Examples</i></p> <p> Sample values for the current range: <b>Current span</b> parameter (→  100)</p>

\* Visibility depends on order options or device settings

## 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 (→ 93)
- Failure mode (→ 94)

#### *Configuration examples*

Pay attention to the configuration examples for **4 mA value** parameter (→ 101).

## 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 (→ 101).

## 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 (→ 93).

### 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 (→ 95)).

**Failure value****Navigation**

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

**Prerequisite**

In the **Failure mode** parameter (→ 94), 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

► Status input 1 to n	
Terminal no. (1358-1 to n)	→ 95
Assign stat.inp. (1352-1 to n)	→ 96
Val.stat.inp. (1353-1 to n)	→ 96
Active level (1351-1 to n)	→ 97
Response time (1354-1 to n)	→ 97

**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.

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

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

## Assign stat.inp.



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

Description	Use this function to select the function for the status input.
-------------	--

Selection	<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>
-----------	---

Factory setting	Off
-----------------	-----

Additional information	<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 (→  68) is activated.</li></ul>
------------------------	--

- Note on the Flow override (→ 68):
- The Flow override (→ 68) is enabled as long as the level is at the status input (continuous signal).
  - All other assignments react to a change in level (pulse) at the status input.

## Val.stat.inp.

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

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

User interface	<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.

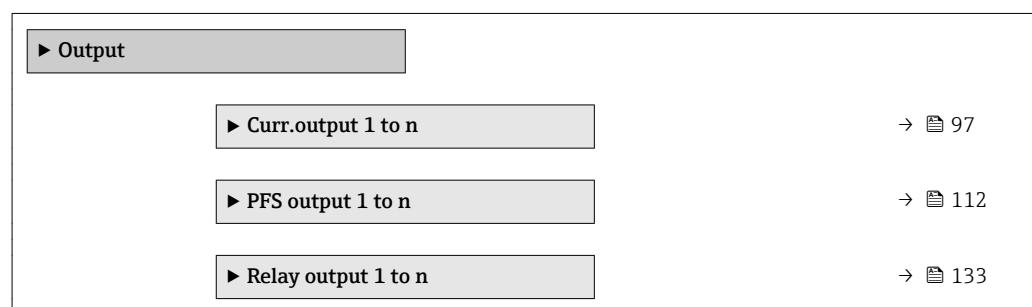
**User entry** 5 to 200 ms

**Factory setting** 50 ms

## 3.5 "Output" submenu

*Navigation*

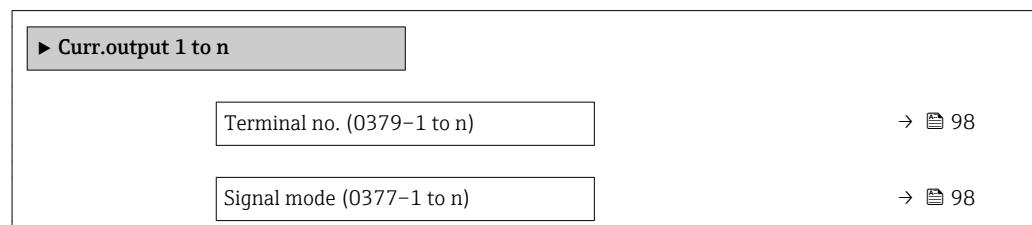
Expert → Output



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

*Navigation*

Expert → Output → Curr.output 1 to n



Assign curr. 1 to n (0359-1 to n)	→  99
Current span (0353-1 to n)	→  100
Fixed current (0365-1 to n)	→  101
0/4 mA value (0367-1 to n)	→  101
20 mA value (0372-1 to n)	→  103
Measuring mode (0351-1 to n)	→  104
Damping out. 1 to n (0363-1 to n)	→  108
Response time (0378-1 to n)	→  109
Failure mode (0364-1 to n)	→  110
Failure current (0352-1 to n)	→  111
Output curr. 1 to n (0361-1 to n)	→  111
Measur. curr. 1 to n (0366-1 to n)	→  112

---

**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
- 24-25 (I/O 2)

**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.

<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Passive *</li> <li>■ Active *</li> </ul>
<b>Factory setting</b>	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.

Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry**: Value 1 display parameter (→ 18)

<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off *</li> <li>■ Mass flow</li> <li>■ Volume flow</li> <li>■ Correct.vol.flow *</li> <li>■ Target mass flow *</li> <li>■ Carrier mass fl. *</li> <li>■ Target vol. flow *</li> <li>■ Carrier vol. fl. *</li> <li>■ Targ.corr.vol.fl *</li> <li>■ Carr.corr.vol.fl *</li> <li>■ Density</li> <li>■ Ref.density *</li> <li>■ Ref.dens.altern. *</li> <li>■ GSV flow</li> <li>■ GSVA *</li> <li>■ NSV flow *</li> <li>■ NSVA *</li> <li>■ S&amp;W volume flow *</li> <li>■ Water cut *</li> <li>■ Oil density *</li> <li>■ Water density *</li> <li>■ Oil mass flow *</li> <li>■ Water mass flow *</li> <li>■ Oil volume flow *</li> <li>■ Water vol. flow *</li> <li>■ Oil corr.vol.fl. *</li> <li>■ Water corr.v.fl. *</li> <li>■ Concentration</li> <li>■ Temperature</li> <li>■ Carr. pipe temp. *</li> <li>■ Electronic temp.</li> <li>■ Osc. freq. 0</li> <li>■ Osc. ampl. 0 *</li> <li>■ Freq. fluct. 0 *</li> <li>■ Osc. damping 0 *</li> <li>■ Osc.damp.fluct 0 *</li> <li>■ Signal asymmetry *</li> <li>■ Exc. current 0 *</li> <li>■ Pressure</li> </ul>
------------------	---

\* Visibility depends on order options or device settings

**Factory setting** Mass 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  
 ■ 4...20 mA US

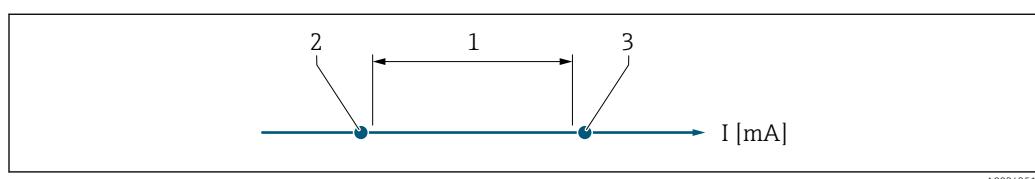
- Additional information** *Description*
- In the event of a device alarm, the current output adopts the value specified in the **Failure mode** parameter (→ 110).  
 ■ If the measured value is outside the measuring range, the diagnostic message **△S441 Curr.output 1 to n** is displayed.  
 ■ The measuring range is specified via the **0/4 mA value** parameter (→ 101) and **20 mA value** parameter (→ 103).

### "Fixed current" option

The current value is set via the **Fixed current** parameter (→ 101).

### Example

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



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

### Selection

Options	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

Options	1	2	3
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 (→  100).

**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** One of the following options is selected in the **Current span** parameter (→  100):

- 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:

- 0 kg/h
- 0 lb/min

**Additional information** *Description*

Positive and negative values are permitted depending on the process variable assigned in the **Assign curr.** parameter (→  99). 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 (→ [103](#)).

#### *Dependency*

**i** The unit depends on the process variable selected in the **Assign curr.** parameter (→ [99](#)).

#### *Current output behavior*

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

- Current span (→ [100](#))
- Failure mode (→ [110](#))

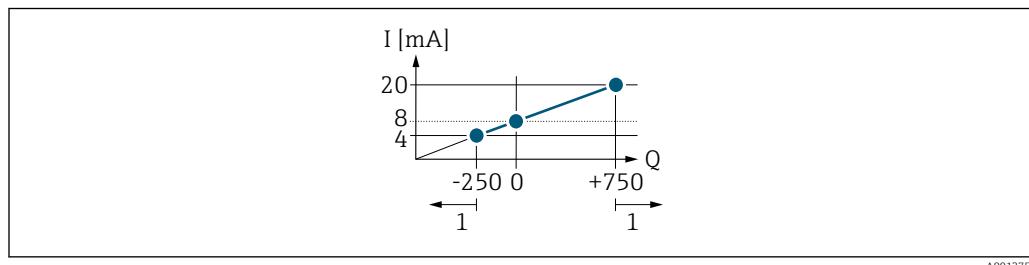
#### *Configuration examples*

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 (→ [101](#)) = not equal to zero flow (e.g. -250 m<sup>3</sup>/h)
- **20 mA value** parameter (→ [103](#)) = not equal to zero flow (e.g. +750 m<sup>3</sup>/h)
- Calculated current value = 8 mA at zero flow

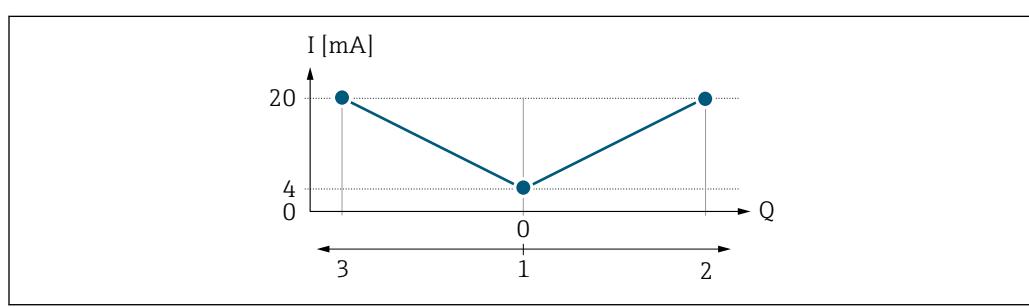


Q    Flow  
 I    Current  
 1    Measuring range is exceeded or undershot

The operational range of the measuring device is defined by the values entered for the **0/4 mA value** parameter (→ [101](#)) and **20 mA value** parameter (→ [103](#)). 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



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 (→ 101) and **20 mA value** parameter (→ 103) must have the same sign. The value for the **20 mA value** parameter (→ 103) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (→ 103) (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 → 104.

## 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 (→ 100):

- 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 → 264

### Additional information

#### Description

Positive and negative values are permitted depending on the process variable assigned in the **Assign curr.** parameter (→ 99). 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 (→ 101).

#### Dependency

The unit depends on the process variable selected in the **Assign curr.** parameter (→ 99).

#### 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 (→ 104), different signs cannot be entered for the values of the **0/4 mA value** parameter (→ 101) and **20 mA value** parameter (→ 103). The diagnostic message **△S441 Curr.output 1 to n** is displayed.

#### Configuration examples

Observe the configuration examples for the **0/4 mA value** parameter (→ 101).

**Measuring mode****Navigation**

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

**Prerequisite**

In the **Assign curr.** parameter (→ 99), one of the following options is selected:

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl. \*
- Density
- Ref.density
- Concentration \*
- Temperature
- Carr. pipe temp. \*
- Electronic temp.
- Osc. freq. 0
- Osc. ampl. 0 \*
- Freq. fluct. 0
- Osc. damping 0
- Osc.damp.fluct 0
- Signal asymmetry
- Exc. current 0

Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry**: Value 1 display parameter (→ 18)

In the **Current span** parameter (→ 100), 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 (→ 99) is displayed below the parameter.

*"Forward flow" option*

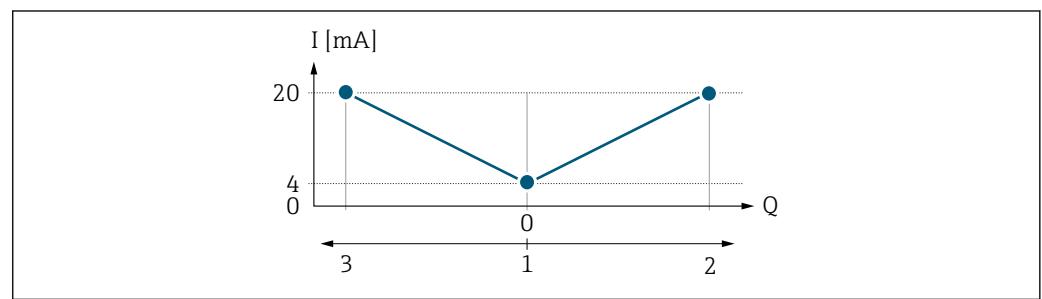
The current output signal is proportional to the process variable assigned. The measuring range is defined by the values that are assigned to the 0/4 mA and 20 mA current value.

\* 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 =  $10 \text{ m}^3/\text{h}$
- If the effective flow exceeds or falls below this measuring range, the diagnostic message **△S441 Curr.output 1 to n** is displayed.

#### *"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 (→ 101) and **20 mA value** parameter (→ 103) must have the same sign.
- The value for the **20 mA value** parameter (→ 103) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (→ 103) (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.

If buffering cannot be processed within approx. 60 s, the diagnostic message **△S441 Curr.output 1 to n** is displayed.

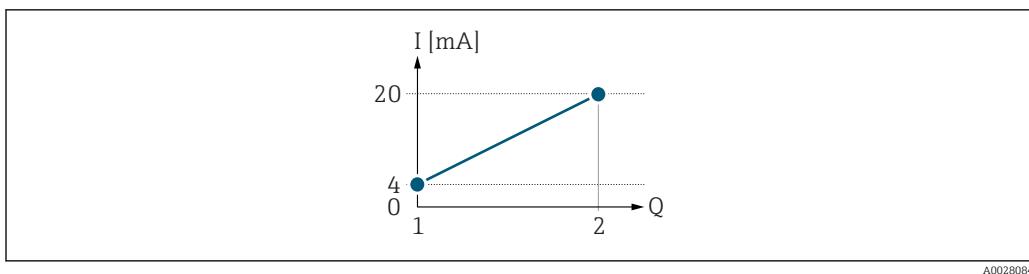
Flow values can aggregate in the buffer in the event of prolonged and unwanted fluid reverse flow. However, these flows are not taken into consideration by the current output configuration, i.e. the reverse flow is not compensated.

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



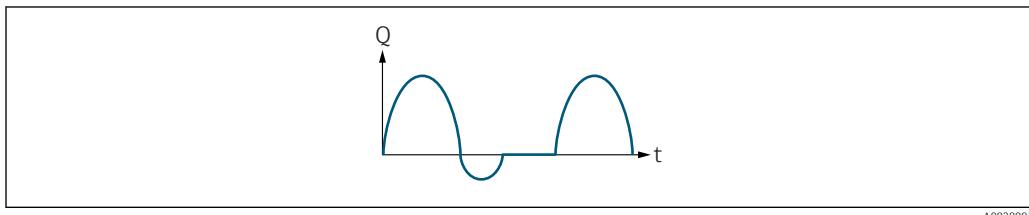
A0028084

**Fig. 2 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)

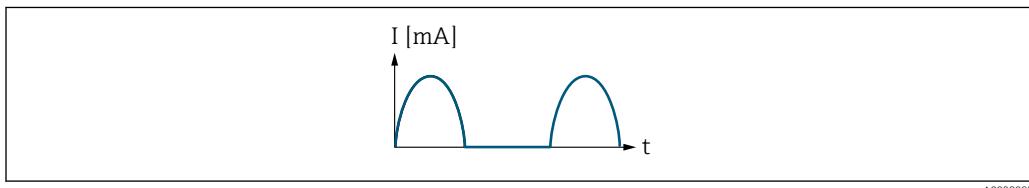
With the following flow response:



A0028091

**Fig. 3 Flow response** $Q$  Flow $t$  TimeWith **Forward flow** option

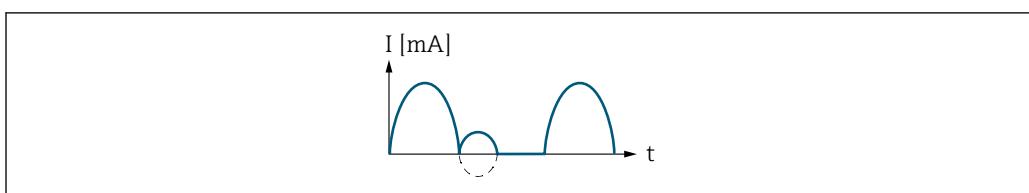
The current output signal is proportional to the process variable assigned. The flow components outside the scaled measuring range are not taken into account for signal output:



A0028092

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

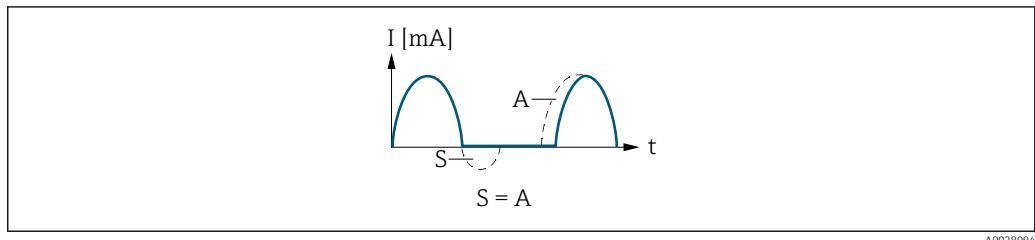
The current output signal is independent of the direction of flow.



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

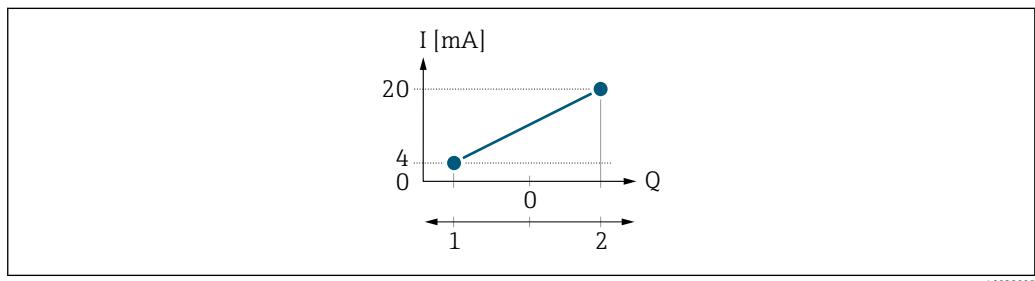
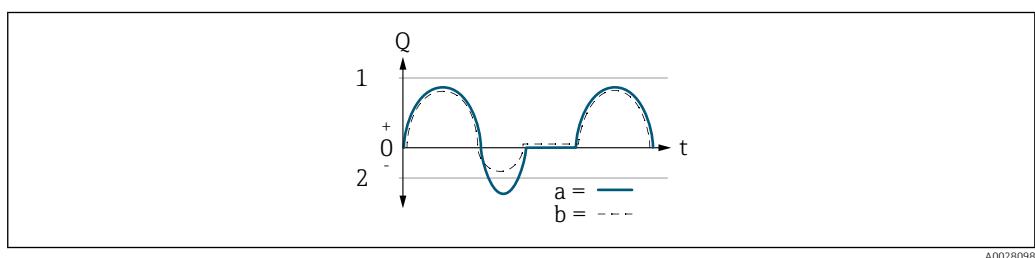


Fig 4 Measuring range

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

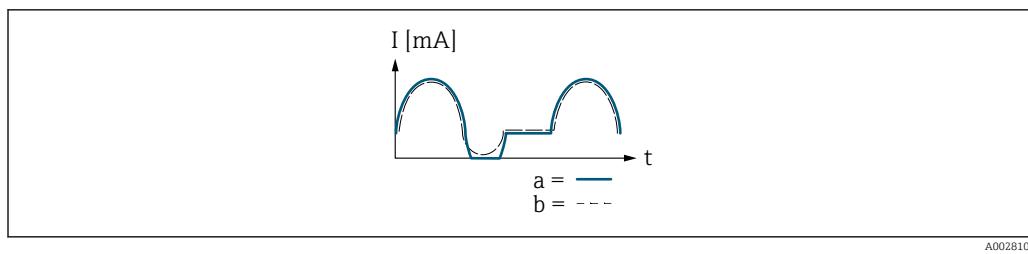
With flow a (-) outside, b (- -) inside the measuring range



$Q$  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.  
The diagnostic message **△S441 Curr.output 1 to n** is displayed.
- b (- -): The current output signal is proportional to the process variable assigned.



$I$  Current  
 $t$  Time

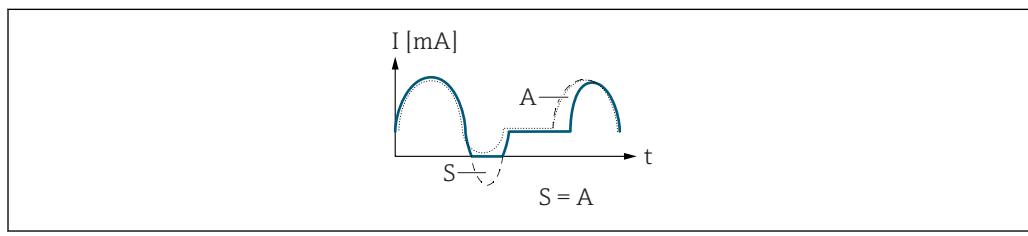
A0028100

### With Forward/Reverse option

This option is not possible in this case as the values for the **0/4 mA value** parameter ( $\rightarrow$  101) and **20 mA value** parameter ( $\rightarrow$  103) 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 ( $\rightarrow$  99) and one of the following options is selected in the **Current span** parameter ( $\rightarrow$  100):

- 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>6)</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**

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

**Prerequisite**

One of the following options is selected in the **Assign curr.** parameter (→ 99):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl. \*
- Density
- Ref.density
- Concentration \*
- Temperature
- Carr. pipe temp. \*
- Electronic temp.
- Osc. freq. 0
- Osc. ampl. 0 \*
- Freq. fluct. 0
- Osc. damping 0
- Osc.damp.fluct 0
- Signal asymmetry
- Exc. current 0



Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry**: Value 1 display parameter (→ 18)

One of the following options is selected in the **Current span** parameter (→ 100):

- 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

<sup>6)</sup> proportional transmission behavior with first order delay  
\* Visibility depends on order options or device settings

**Additional information***Description*

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

- Current output damping → [108](#)  
and
- Depending on the measured variable assigned to the output.
  - Flow damping  
or
  - Density damping  
or
  - Temperature 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 (→ [99](#)) and one of the following options is selected in the **Current span** parameter (→ [100](#)):

- 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.

**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 (→ 100).

*"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 (→ 100).

*"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 (→ 111).

**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 (→ 110).

**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

<b>► PFS output 1 to n</b>	
Terminal no. (0492–1 to n)	→ <a href="#">113</a>
Signal mode (0490–1 to n)	→ <a href="#">114</a>
Operating mode (0469–1 to n)	→ <a href="#">114</a>
Assign pulse 1 to n (0460–1 to n)	→ <a href="#">116</a>
Value per pulse (0455–1 to n)	→ <a href="#">116</a>
Pulse width (0452–1 to n)	→ <a href="#">117</a>
Measuring mode (0457–1 to n)	→ <a href="#">117</a>
Failure mode (0480–1 to n)	→ <a href="#">118</a>
Pulse output 1 to n (0456–1 to n)	→ <a href="#">119</a>
Assign freq. (0478–1 to n)	→ <a href="#">119</a>
Min. freq. value (0453–1 to n)	→ <a href="#">120</a>
Max. freq. value (0454–1 to n)	→ <a href="#">121</a>
Val. at min.freq (0476–1 to n)	→ <a href="#">121</a>
Val. at max.freq (0475–1 to n)	→ <a href="#">121</a>
Measuring mode (0479–1 to n)	→ <a href="#">122</a>
Damping out. 1 to n (0477–1 to n)	→ <a href="#">123</a>

Response time (0491-1 to n)	→  124
Failure mode (0451-1 to n)	→  124
Failure freq. (0474-1 to n)	→  125
Output freq. 1 to n (0471-1 to n)	→  125
Switch out funct (0481-1 to n)	→  126
Assign diag. beh (0482-1 to n)	→  126
Assign limit (0483-1 to n)	→  127
Switch-on value (0466-1 to n)	→  129
Switch-off value (0464-1 to n)	→  129
Assign dir.check (0484-1 to n)	→  130
Assign status (0485-1 to n)	→  130
Switch-on delay (0467-1 to n)	→  131
Switch-off delay (0465-1 to n)	→  131
Failure mode (0486-1 to n)	→  131
Switch status 1 to n (0461-1 to n)	→  132
Invert outp.sig. (0470-1 to n)	→  132

---

**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.

**User interface**

- Not used
- 24-25 (I/O 2)

**Additional information**

*"Not used" option*

The pulse/frequency/switch output module does not use any terminal numbers.

**Signal mode****Navigation**

Expert → Output → PFS output 1 to n → Signal mode (0490–1 to n)

**Description**

Use this function to select the signal mode for the pulse/frequency/switch output.

**Selection**

- Passive
- Active

**Factory setting**

Passive

**Operating mode****Navigation**

Expert → Output → PFS output 1 to n → Operating mode (0469–1 to n)

**Description**

Use this function to select the operating mode of the output as a pulse, frequency or switch output.

**Selection**

- Pulse
- Frequency
- Switch

**Factory setting**

Pulse

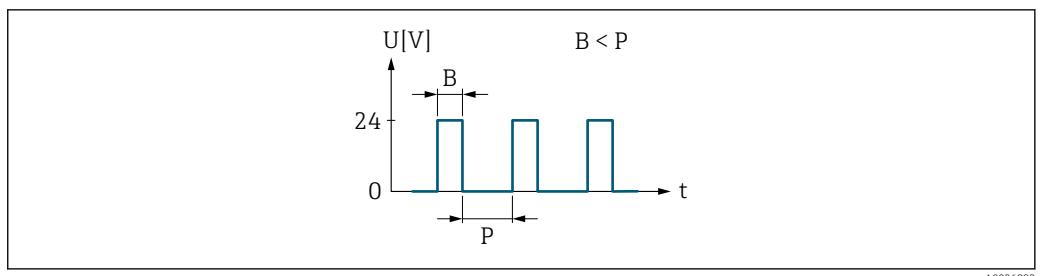
**Additional information***"Pulse" option*

Quantity-dependent pulse with configurable pulse width

- Whenever a specific mass, volume, corrected volume, target mass or carrier mass is reached (pulse value), a pulse is output, the duration of which was set previously (pulse width).
- The pulses are never shorter than the set duration.

*Example*

- Flow rate approx. 100 g/s
- Pulse value 0.1 g
- Pulse width 0.05 ms
- Pulse rate 1 000 Impuls/s



■ 5 Quantity-proportional pulse (pulse value) with pulse width to be configured

B Pulse width entered

P Pauses between the individual pulses

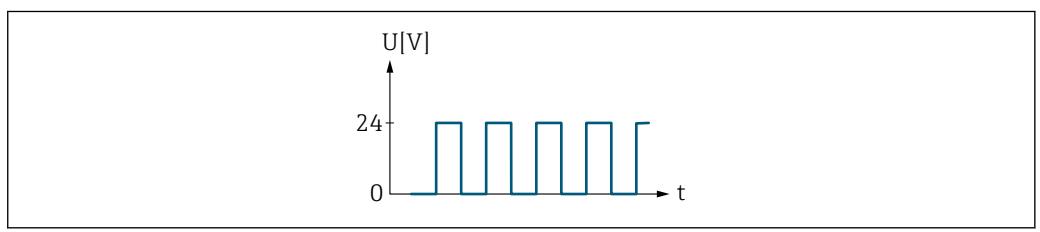
#### "Frequency" option

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 mass flow, volume flow, corrected volume flow, target mass flow, carrier mass flow, density, reference density, concentration, temperature, carrier tube temperature, electronic temperature, vibration frequency, frequency fluctuation, oscillation amplitude, oscillation damping, oscillation damping fluctuation, signal asymmetry or excitation current.

#### Example

- Flow rate approx. 100 g/s
- Max. frequency 10 kHz
- Flow rate at max. frequency 1000 g/s
- Output frequency approx. 1000 Hz



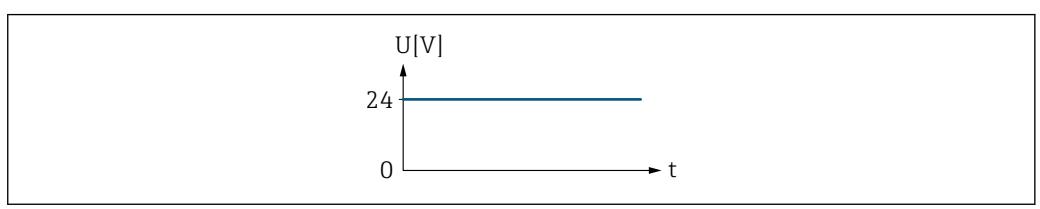
■ 6 Flow-proportional frequency output

#### "Switch" option

Contact for displaying a condition (e.g. alarm or warning if a limit value is reached)

#### Example

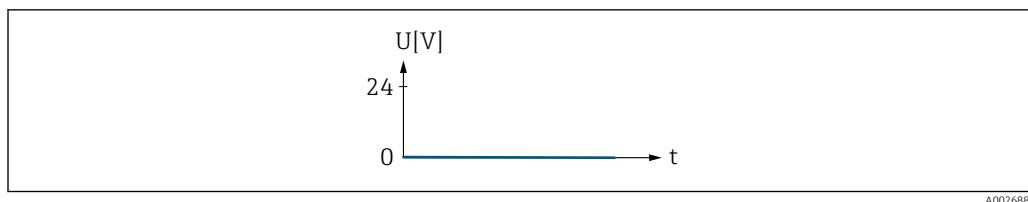
Alarm response without alarm



■ 7 No alarm, high level

#### Example

Alarm response in case of alarm



8 *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 (→ 114) parameter.

### Description

Use this function to select the process variable for the pulse output.

### Selection

- Off
- Mass flow
- Volume flow
- Correct.vol.flow \*
- Target mass flow \*
- Carrier mass fl. \*
- Target vol. flow \*
- Carrier vol. fl. \*
- Targ.corr.vol.fl \*
- Carr.corr.vol.fl \*

### Factory setting

Off

## Value per pulse



### Navigation

Expert → Output → PFS output 1 to n → Value per pulse (0455–1 to n)

### Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (→ 114) and a process variable is selected in the **Assign pulse** parameter (→ 116).

### Description

Use this function to enter the value for the measured value that a pulse is equivalent to.

### User entry

Signed floating-point number

### Factory setting

Depends on country and nominal diameter → 264

### 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 (→ 114) and a process variable is selected in the **Assign pulse** parameter (→ 116).

**Description**

Use this function to enter the duration of the output pulse.

**User entry**

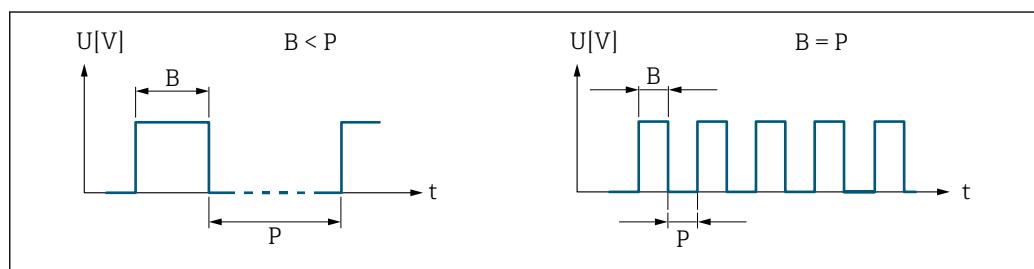
0.05 to 2 000 ms

**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**.



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)

**Prerequisite**

In the **Operating mode** parameter (→ 114), the **Pulse** option is selected, and one of the following options is selected in the **Assign pulse** parameter (→ 116):

- Mass flow
- Volume flow
- Correct.vol.flow \*
- Target mass flow \*
- Carrier mass fl. \*

\* Visibility depends on order options or device settings

**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 (→ 104)

*Examples*

 For a detailed description of the configuration examples, see the **Measuring mode** parameter (→ 104)

## 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 (→ 114) and a process variable is selected in the **Assign pulse** parameter (→ 116).

**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.

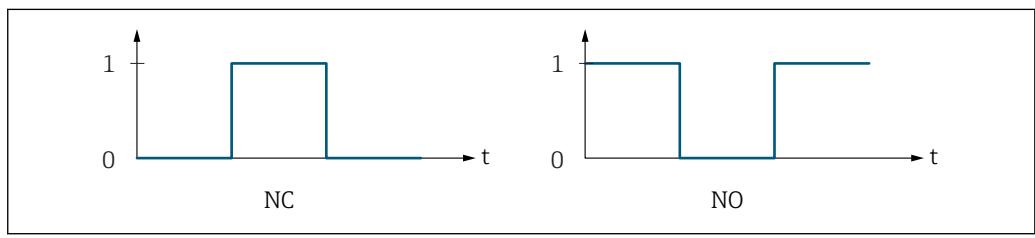
*Selection*

- 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

<b>Navigation</b>	 Expert → Output → PFS output 1 to n → Pulse output 1 to n (0456–1 to n)
<b>Prerequisite</b>	The <b>Pulse</b> option is selected in the <b>Operating mode</b> parameter (→ <a href="#">114</a> ) parameter.
<b>Description</b>	Displays the pulse frequency currently output.
<b>User interface</b>	Positive floating-point number
<b>Additional information</b>	<p><i>Description</i></p> <ul style="list-style-type: none"> <li>■ The pulse output is an open collector output.</li> <li>■ 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.</li> </ul>



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- 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 (→ [132](#)) 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 (→ [118](#))) can be configured.

## Assign freq.

<b>Navigation</b>	 Expert → Output → PFS output 1 to n → Assign freq. (0478–1 to n)
<b>Prerequisite</b>	The <b>Frequency</b> option is selected in the <b>Operating mode</b> parameter (→ <a href="#">114</a> ) parameter.
<b>Description</b>	<p>Use this function to select the process variable for the frequency output.</p> <p> Detailed description of the options <b>Oscil. frequency</b>, <b>Oscil. amplitude</b>, <b>Oscil. damping</b> and <b>Signal asymmetry: Value 1 display</b> parameter (→ <a href="#">18</a>)</p>

**Selection**

- Off
- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl. \*
- Target vol. flow \*
- Carrier vol. fl. \*
- Targ.corr.vol.fl \*
- Carr.corr.vol.fl \*
- Density
- Ref.density
- Ref.dens.altern. \*
- GSV flow
- GSVA \*
- NSV flow \*
- NSVA \*
- S&W volume flow \*
- Water cut \*
- Oil density \*
- Water density \*
- Oil mass flow \*
- Water mass flow \*
- Oil volume flow \*
- Water vol. flow \*
- Oil corr.vol.fl.
- Water corr.v.fl. \*
- Concentration
- Temperature
- Carr. pipe temp. \*
- Electronic temp.
- Osc. freq. 0
- Osc. ampl. 0 \*
- Freq. fluct. 0 \*
- Osc. damping 0 \*
- Osc.damp.fluct 0 \*
- Signal asymmetry \*
- Exc. current 0 \*
- HBSI \*
- Pressure

**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 (→ 114) and a process variable is selected in the **Assign freq.** parameter (→ 119).

**Description**

Use this function to enter the start value frequency.

\* Visibility depends on order options or device settings

**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 (→ 114) and a process variable is selected in the **Assign freq.** parameter (→ 119).

**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

### 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 (→ 114) and a process variable is selected in the **Assign freq.** parameter (→ 119).

**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 (→ 119).

### 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 (→ 114) and a process variable is selected in the **Assign freq.** parameter (→ 119).

**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 (→ 119).

**Measuring mode****Navigation**

 Expert → Output → PFS output 1 to n → Measuring mode (0479-1 to n)

**Prerequisite**

In the **Operating mode** parameter (→ 114), the **Frequency** option is selected, and one of the following options is selected in the **Assign freq.** parameter (→ 119):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl. \*
- Density
- Ref.density
- Concentration \*
- Temperature
- Carr. pipe temp. \*
- Electronic temp.
- Osc. freq. 0
- Freq. fluct. 0
- Osc. ampl. 0 \*
- Osc. damping 0
- Osc.damp.fluct 0
- Signal asymmetry
- Exc. current 0

 Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry**: Value 1 display parameter (→ 18)

**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 (→ 104)

*Examples*

 For a detailed description of the configuration examples, see the **Measuring mode** parameter (→ 104)

\* Visibility depends on order options or device settings

**Damping out. 1 to n****Navigation**

Expert → Output → PFS output 1 to n → Damping out. 1 to n (0477-1 to n)

**Prerequisite**

In the **Operating mode** parameter (→ 114), the **Frequency** option is selected, and one of the following options is selected in the **Assign freq.** parameter (→ 119):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl. \*
- Density
- Ref.density
- Concentration \*
- Temperature
- Carr. pipe temp. \*
- Electronic temp.
- Osc. freq. 0
- Freq. fluct. 0
- Osc. ampl. 0 \*
- Osc. damping 0
- Osc.damp.fluct 0
- Signal asymmetry
- Exc. current 0

Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry**: Value 1 display parameter (→ 18)

**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>7)</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.

\* Visibility depends on order options or device settings

7) proportional transmission behavior with first order delay

## Response time

### Navigation

  Expert → Output → PFS output 1 to n → Response time (0491–1 to n)

### Prerequisite

In the **Operating mode** parameter (→ 114), the **Frequency** option is selected, and one of the following options is selected in the **Assign freq.** parameter (→ 119):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl. \*
- Density
- Ref.density
- Concentration \*
- Temperature
- Carr. pipe temp. \*
- Electronic temp.
- Osc. freq. 0
- Freq. fluct. 0
- Osc. ampl. 0 \*
- Osc. damping 0
- Osc.damp.fluct 0
- Signal asymmetry
- Exc. current 0

 Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry**: Value 1 display parameter (→ 18)

### 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

### Additional information

#### Description



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

- Damping of pulse/frequency/switch output → 108  
and
- Depending on the measured variable assigned to the output.
  - Flow damping
  - or
  - Density 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 (→ 114) and a process variable is selected in the **Assign freq.** parameter (→ 119).

\* Visibility depends on order options or device settings

<b>Description</b>	Use this function to select the failure mode of the frequency output in the event of a device alarm.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Actual value</li> <li>■ Defined value</li> <li>■ 0 Hz</li> </ul>
<b>Factory setting</b>	0 Hz
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ 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.</li> <li>■ Defined value In the event of a device alarm, the frequency output continues on the basis of a predefined value. The Failure freq. (→ 125) 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.</li> <li>■ 0 Hz In the event of a device alarm, the frequency 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>

**Failure freq.**

<b>Navigation</b>	Expert → Output → PFS output 1 to n → Failure freq. (0474-1 to n)
<b>Prerequisite</b>	The <b>Frequency</b> option is selected in the <b>Operating mode</b> parameter (→ 114) and a process variable is selected in the <b>Assign freq.</b> parameter (→ 119).
<b>Description</b>	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 (→ 114), 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



**Navigation** Expert → Output → PFS output 1 to n → Switch out funct (0481–1 to n)

**Prerequisite** The **Switch** option is selected in the **Operating mode** parameter (→ [114](#)).

**Description** Use this function to select a function for the switch output.

**Selection**

- Off
- On
- Diag. behavior
- Limit
- Fl. direct.check
- Status

**Factory setting** Off

**Additional information** Selection

- Off  
The switch output is permanently switched off (open, non-conductive).
- On  
The switch output is permanently switched on (closed, 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).
- Status  
Indicates the device status depending on whether empty pipe detection or low flow cut off is selected.

## Assign diag. beh



**Navigation** Expert → Output → PFS output 1 to n → Assign diag. beh (0482–1 to n)

**Prerequisite**

- In the **Operating mode** parameter (→ [114](#)), the **Switch** option is selected.
- In the **Switch out funct** parameter (→ [126](#)), 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 (→ 114) parameter.
- The **Limit** option is selected in the **Switch out funct** parameter (→ 126) parameter.

**Description**

Use this function to select a process variable for the limit function.

**Selection**

- Mass flow
- Volume flow
- Correct.vol.flow \*
- Target mass flow \*
- Carrier mass fl. \*
- Target vol. flow \*
- Carrier vol. fl. \*
- Targ.corr.vol.fl \*
- Carr.corr.vol.fl \*
- Density
- Ref.density \*
- Ref.dens.altern. \*
- GSV flow \*
- GSVA \*
- NSV flow \*
- NSVA \*
- S&W volume flow \*
- Water cut \*
- Oil density \*
- Water density \*
- Oil mass flow
- Water mass flow \*
- Oil volume flow \*
- Water vol. flow \*
- Oil corr.vol.fl. \*
- Water corr.v.fl. \*
- Concentration
- Temperature
- Oscil. damping
- Pressure

\* Visibility depends on order options or device settings

- Totalizer 1
- Totalizer 2
- Totalizer 3

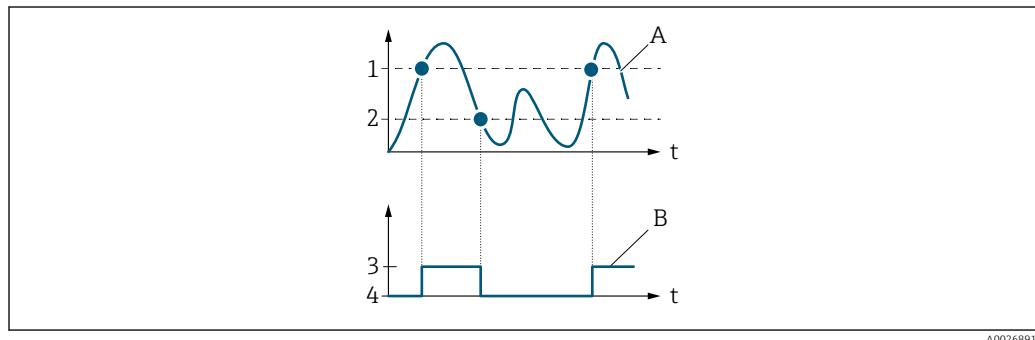
**Factory setting**

Mass flow

**Additional information***Description*

Behavior of status output when Switch-on value &gt; Switch-off value:

- Process variable > Switch-on value: transistor is conductive
- Process variable < Switch-off value: transistor is non-conductive

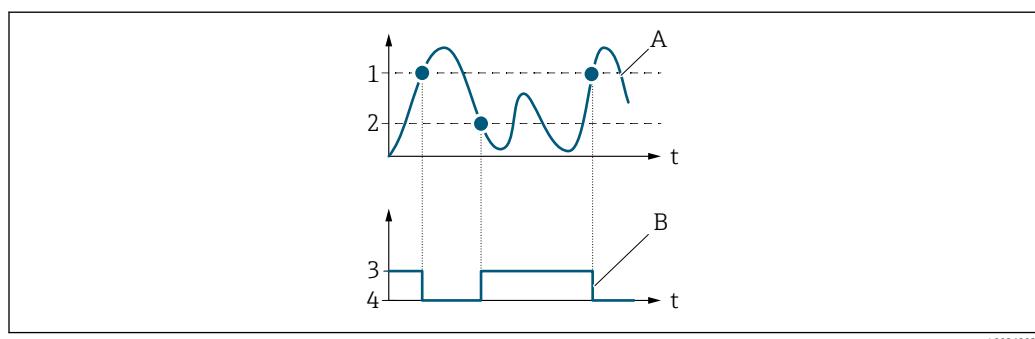


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- |   |                  |
|---|------------------|
| 1 | Switch-on value  |
| 2 | Switch-off value |
| 3 | Conductive       |
| 4 | Non-conductive   |
| A | Process variable |
| B | Status output    |

Behavior of status output when Switch-on value &lt; Switch-off value:

- Process variable < Switch-on value: transistor is conductive
- Process variable > Switch-off value: transistor is non-conductive

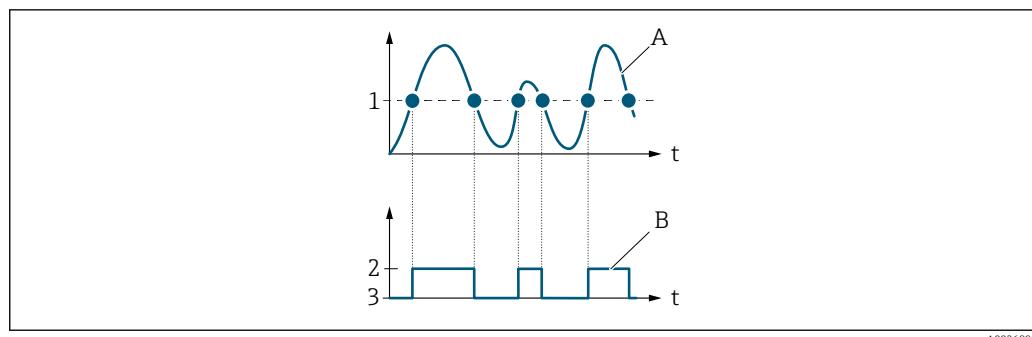


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- |   |                  |
|---|------------------|
| 1 | Switch-off value |
| 2 | Switch-on value  |
| 3 | Conductive       |
| 4 | Non-conductive   |
| A | Process variable |
| B | Status output    |

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

- In the **Operating mode** parameter (→ 114), the **Switch** option is selected.
- In the **Switch out funct** parameter (→ 126), the **Limit** option is selected.

### Description

Use this function to enter the measured value for the switch-on point.

### User entry

Signed floating-point number

### Factory setting

Country-specific:

- 0 kg/h
- 0 lb/min

### 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 (→ 127).

## Switch-off value



### Navigation

Expert → Output → PFS output 1 to n → Switch-off value (0464-1 to n)

### Prerequisite

- In the **Operating mode** parameter (→ 114), the **Switch** option is selected.
- In the **Switch out funct** parameter (→ 126), the **Limit** option is selected.

### Description

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>	Country-specific: ■ 0 kg/h ■ 0 lb/min
<b>Additional information</b>	<p><i>Description</i></p> <p>Use this function to enter the limit value for the switch-off value (process variable &lt; switch-off value = open, non-conductive).</p> <p> When using a hysteresis: Switch-on value &gt; Switch-off value.</p> <p><i>Dependency</i></p> <p> The unit depends on the process variable selected in the <b>Assign limit</b> parameter (→ 127).</p>

## Assign dir.check



<b>Navigation</b>	 Expert → Output → PFS output 1 to n → Assign dir.check (0484-1 to n)
<b>Prerequisite</b>	<ul style="list-style-type: none"> <li>The <b>Switch</b> option is selected in the <b>Operating mode</b> parameter (→ 114).</li> <li>The <b>Fl. direct.check</b> option is selected in the <b>Switch out funct</b> parameter (→ 126).</li> </ul>
<b>Description</b>	Use this function to select a process variable for monitoring the flow direction.
<b>Selection</b>	<ul style="list-style-type: none"> <li>Off</li> <li>Volume flow</li> <li>Mass flow</li> <li>Correct.vol.flow *</li> </ul>
<b>Factory setting</b>	Mass flow

## Assign status



<b>Navigation</b>	 Expert → Output → PFS output 1 to n → Assign status (0485-1 to n)
<b>Prerequisite</b>	<ul style="list-style-type: none"> <li>The <b>Switch</b> option is selected in the <b>Operating mode</b> parameter (→ 114).</li> <li>The <b>Status</b> option is selected in the <b>Switch out funct</b> parameter (→ 126).</li> </ul>
<b>Description</b>	Use this function to select a device status for the switch output.
<b>Selection</b>	<ul style="list-style-type: none"> <li>Partial pipe det</li> <li>Low flow cut off</li> <li>Digital outp. 4 *</li> </ul>
<b>Factory setting</b>	Partial pipe det

\* Visibility depends on order options or device settings

**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**

Diagram 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 (→ 114).
- The **Limit** option is selected in the **Switch out funct** parameter (→ 126).

**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**

Diagram 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 (→ 114).
- The **Limit** option is selected in the **Switch out funct** parameter (→ 126).

**Description**

Use this function to enter a delay time for switching off the switch output.

**User entry**

0.0 to 100.0 s

**Factory setting**

0.0 s

**Failure mode****Navigation**

Diagram Expert → Output → PFS output 1 to n → Failure mode (0486-1 to n)

**Description**

Use this function to select a failsafe mode for the switch output in the event of a device alarm.

**Selection**

- Actual status
- Open
- Closed

**Factory setting**

Open

**Additional information***Options*

## ■ 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 **Actual status** option behaves in the same way as the current input value.

## ■ Open

In the event of a device alarm, the switch output's transistor is set to **non-conductive**.

## ■ Closed

In the event of a device alarm, the switch output's transistor is set to **conductive**.

**Switch status 1 to n****Navigation**

Expert → Output → 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 (→ 114).

**Description**

Displays the current switch status of the status output.

**User interface**

- Open
- Closed

**Additional information***User interface*

## ■ Open

The switch output is not conductive.

## ■ Closed

The switch output is conductive.

**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**

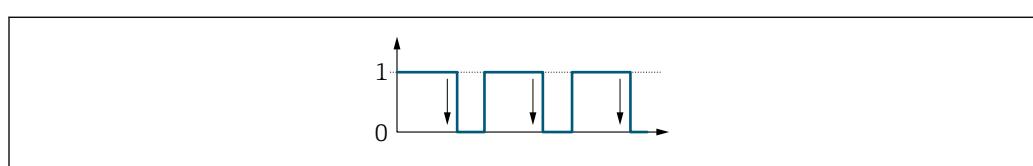
- No
- Yes

**Factory setting**

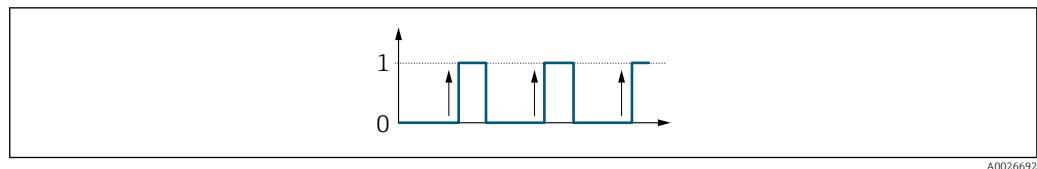
No

**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.	→ 133
Relay outp.func.	→ 134
Assign dir.check	→ 134
Assign limit	→ 135
Assign diag. beh	→ 136
Assign status	→ 136
Switch-off value	→ 136
Switch-off delay	→ 137
Switch-on value	→ 137
Switch-on delay	→ 138
Failure mode	→ 138
Switch status	→ 139
Powerless relay	→ 139

---

#### 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	<ul style="list-style-type: none"><li>■ Not used</li><li>■ 24-25 (I/O 2)</li></ul>
----------------	--

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	<ul style="list-style-type: none"><li>■ Closed</li><li>■ Open</li><li>■ Diag. behavior</li><li>■ Limit</li><li>■ Fl. direct.check</li><li>■ Digital Output</li></ul>
-----------	--

Factory setting	Closed
-----------------	--------

Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"><li>■ Closed The relay output is permanently switched on (closed, conductive).</li><li>■ Open The relay output is permanently switched off (open, non-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>■ Fl. direct.check Indicates the flow direction (forward or reverse flow).</li><li>■ Digital Output Indicates the device status depending on whether empty pipe detection or low flow cut off is selected.</li></ul>
------------------------	---

## Assign dir.check



Navigation	Expert → Output → Relay output 1 to n → Assign dir.check (0808–1 to n)
------------	--

Prerequisite	In the <b>Relay outp.func.</b> parameter (→ 134), the <b>Fl. direct.check</b> option is selected.
--------------	---

Description	Use this function to select a process variable for monitoring the flow direction.
-------------	---

<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Volume flow</li> <li>■ Mass flow</li> <li>■ Correct.vol.flow *</li> </ul>
------------------	---

<b>Factory setting</b>	Mass 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 (→ 134) parameter.

**Description** Use this function to select a process variable for the limit value function.

<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Mass flow</li> <li>■ Volume flow</li> <li>■ Correct.vol.flow *</li> <li>■ Target mass flow *</li> <li>■ Carrier mass fl. *</li> <li>■ Target vol. flow *</li> <li>■ Carrier vol. fl. *</li> <li>■ Targ.corr.vol.fl *</li> <li>■ Carr.corr.vol.fl *</li> <li>■ Density</li> <li>■ Ref.density *</li> <li>■ Ref.dens.altern. *</li> <li>■ GSV flow *</li> <li>■ GSVA *</li> <li>■ NSV flow *</li> <li>■ NSVA *</li> <li>■ S&amp;W volume flow *</li> <li>■ Water cut *</li> <li>■ Oil density *</li> <li>■ Water density *</li> <li>■ Oil mass flow</li> <li>■ Water mass flow *</li> <li>■ Oil volume flow *</li> <li>■ Water vol. flow *</li> <li>■ Oil corr.vol.fl. *</li> <li>■ Water corr.v.fl. *</li> <li>■ Concentration</li> <li>■ Temperature</li> <li>■ Oscil. damping</li> <li>■ Pressure</li> <li>■ Totalizer 1</li> <li>■ Totalizer 2</li> <li>■ Totalizer 3</li> </ul>
------------------	---

<b>Factory setting</b>	Mass flow
------------------------	-----------

\* Visibility depends on order options or device settings

## 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 (→ 134), 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.

## Assign status



### Navigation

Expert → Output → Relay output 1 to n → Assign status (0805–1 to n)

### Prerequisite

In the **Relay outp.func.** parameter (→ 134), the **Digital Output** option is selected.

### Description

Use this function to select the device status for the relay output.

### Selection

- Partial pipe det
- Low flow cut off
- Digital outp. 4<sup>\*</sup>

### Factory setting

Partial pipe det

## Switch-off value



### Navigation

Expert → Output → Relay output 1 to n → Switch-off value (0809–1 to n)

### Prerequisite

In the **Relay outp.func.** parameter (→ 134), the **Limit** option is selected.

\* Visibility depends on order options or device settings

<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>	Country-specific: ■ 0 kg/h ■ 0 lb/min
<b>Additional information</b>	<p><i>Description</i></p> <p>Use this function to enter the limit value for the switch-off value (process variable &lt; switch-off value = open, non-conductive).</p> <p> When using a hysteresis: Switch-on value &gt; Switch-off value.</p> <p><i>Dependency</i></p> <p> The unit is dependent on the process variable selected in the <b>Assign limit</b> parameter (→ 135).</p>

---

## 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 (→ 134), 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



<b>Navigation</b>	 Expert → Output → Relay output 1 to n → Switch-on value (0810-1 to n)
<b>Prerequisite</b>	In the <b>Relay outp.func.</b> parameter (→ 134), the <b>Limit</b> option is selected.
<b>Description</b>	Use this function to enter the measured value for the switch-on point.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	Country-specific: ■ 0 kg/h ■ 0 lb/min

**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 (→ 135).

**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 (→ 134), 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

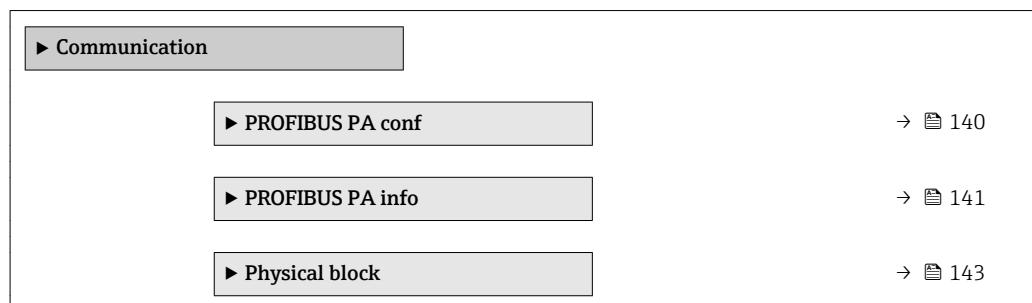
**Factory setting** Open

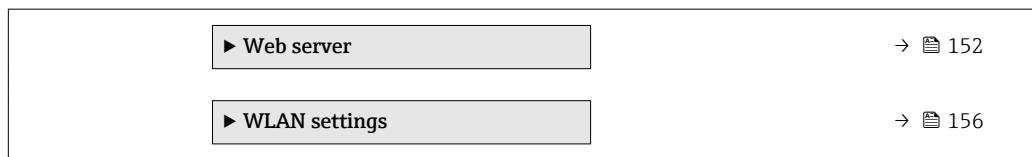
**Additional information** *Selection*

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

## 3.6 "Communication" submenu

*Navigation*   Expert → Communication

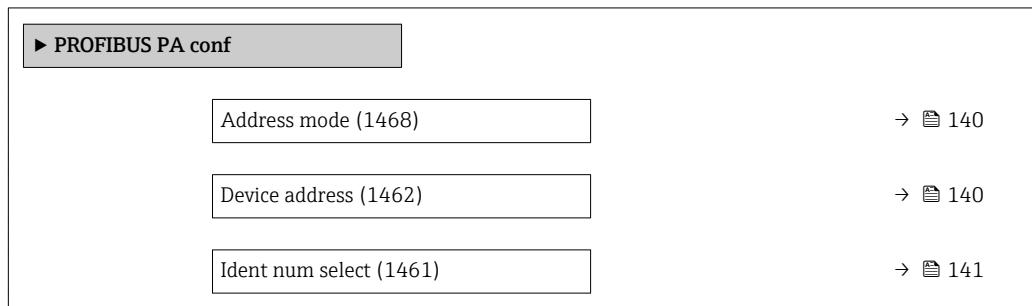




### 3.6.1 "PROFIBUS PA conf" submenu

Navigation

Expert → Communication → PROFIBUS PA conf




---

## Address mode

---

Navigation

Expert → Communication → PROFIBUS PA conf → Address mode (1468)

Description

Displays the configured address mode.

User interface

- Hardware
- Software

Factory setting

Software

Additional information

Description

For detailed information, see the "Setting the device address" section of the Operating Instructions.

---

## Device address

---



Navigation

Expert → Communication → PROFIBUS PA conf → Device address (1462)

Description

Use this function to enter the device address.

User entry

0 to 126

Factory setting

126

Additional information

Description

The address must always be configured for a PROFIBUS device. The valid address range is between 1 and 126. In a PROFIBUS network, each address can only be assigned once. If an address is not configured correctly, the device is not recognized by the master. All

measuring devices are delivered from the factory with the device address 126 and with the software addressing method.

 Displays the configured address mode: **Address mode** parameter (→ 140)

## Ident num select



### Navigation

  Expert → Communication → PROFIBUS PA conf → Ident num select (1461)

### Description

Use this function to select the device master file (GSD).

### Selection

- Automatic mode
- Manufacturer
- Profile
- 1AI,1Tot(0x9740)
- 2AI,1Tot(0x9741)
- Promass 80
- Promass 83

### Factory setting

Automatic mode

### Additional information

#### Description

In order to integrate the field devices into the bus system, the PROFIBUS system needs a description of the device parameters, such as output data, input data, data format, data volume and supported transmission rate. These data are available in the device master file (GSD) which is provided to the PROFIBUS Master when the communication system is commissioned.

## 3.6.2 "PROFIBUS PA info" submenu

### Navigation

  Expert → Communication → PROFIBUS PA info

 PROFIBUS PA info	
Stat Master Conf (1465)	→ 142
Ident number (1464)	→ 142
Profile version (1463)	→ 142
Baudrate (1504)	→ 142
Master avail. (1517)	→ 143

**Stat Master Conf**

---

<b>Navigation</b>	 Expert → Communication → PROFIBUS PA info → Stat Master Conf (1465)
<b>Description</b>	For displaying the status of the PROFIBUS Master configuration.
<b>User interface</b>	<ul style="list-style-type: none"><li>▪ Active</li><li>▪ Not active</li></ul>
<b>Factory setting</b>	Not active

---

**Ident number**

---

<b>Navigation</b>	 Expert → Communication → PROFIBUS PA info → Ident number (1464)
<b>Description</b>	For displaying the PROFIBUS identification number.
<b>User interface</b>	0 to FFFF
<b>Factory setting</b>	0x156D

---

**Profile version**

---

<b>Navigation</b>	 Expert → Communication → PROFIBUS PA info → Profile version (1463)
<b>Description</b>	Displays the profile version.
<b>User interface</b>	Max. 32 characters such as letters, numbers or special characters (e.g. @, %, /).
<b>Factory setting</b>	3.02

---

**Baudrate**

---

<b>Navigation</b>	 Expert → Communication → PROFIBUS PA info → Baudrate (1504)
<b>Description</b>	Displays the transmission rate.
<b>User interface</b>	<ul style="list-style-type: none"><li>▪ Not available</li><li>▪ 31.25 kBaud</li></ul>
<b>Factory setting</b>	31.25 kBaud

**Master avail.**

**Navigation**   Expert → Communication → PROFIBUS PA info → Master avail. (1517)

**Description** Displays whether or not a PROFIBUS master is present in the network.

**User interface**

- No
- Yes

**Factory setting** No

### 3.6.3 "Physical block" submenu

*Navigation*   Expert → Communication → Physical block

► Physical block	
Device tag (1496)	→ 
Static revision (1495)	→ 
Strategy (1494)	→ 
Alert key (1473)	→ 
Target mode (1497)	→ 
Mode block act (1472)	→ 
Mode block perm (1493)	→ 
Mode blk norm (1492)	→ 
Alarm summary (1474)	→ 
Software rev. (1478)	→ 
Hardware rev. (1479)	→ 
Manufacturer ID (1502)	→ 
Device ID (1480)	→ 
Serial number (1481)	→ 
Diagnostics (1482)	→ 

Diagnostics mask (1484)	→  149
Device certific. (1486)	→  149
Factory reset (1488)	→  150
Descriptor (1489)	→  150
Device message (1490)	→  150
Device inst.date (1491)	→  150
Ident num select (1461)	→  151
Hardware lock (1499)	→  151
Feature support (1477)	→  152
Feature enabled (1476)	→  152
Condensed status (1500)	→  152

## Device tag



### Navigation

Expert → Communication → Physical block → Device tag (1496)

### Description

Use this function to enter the name for the measuring point.

### User entry

Max. 32 characters, such as letters, numbers or special characters (e.g. @, %, /).

### Factory setting

Cubemass 500 PA

## Static revision

### Navigation

Expert → Communication → Physical block → Static revision (1495)

### Description

Displays the event counter: every write access to a static block parameter is counted.

### User interface

0 to FFFF

### Additional information

*Description*

Static parameters are parameters that are not changed by the process.

---

**Strategy****Navigation**

Expert → Communication → Physical block → Strategy (1494)

**Description**

Use this function to enter the strategy: makes it possible to group blocks by entering identical numbers.

**User entry**

0 to FFFF

**Factory setting**

0

---

**Alert key****Navigation**

Expert → Communication → Physical block → Alert key (1473)

**Description**

Use this function to enter the alert key: identifies the section of the plant where the transmitter is located. This helps in pinpointing events.

**User entry**

0 to 0xFF

**Factory setting**

0

---

**Target mode****Navigation**

Expert → Communication → Physical block → Target mode (1497)

**Description**

Displays the Target mode: The target mode indicates which mode of operation is used for this function block. This mode is generally set by a control application.

**User interface**

- Auto
- Out of service

---

**Mode block act****Navigation**

Expert → Communication → Physical block → Mode block act (1472)

**Description**

Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→ 145).

**User interface**

- Auto
- Out of service

**Additional information***Description*

A comparison of the current mode with the target mode (**Target mode** parameter (→ 145)) indicates whether it was possible to reach the target mode.

---

**Mode block perm**

---

**Navigation**

Expert → Communication → Physical block → Mode block perm (1493)

**Description**

Displays the Mode block perm: This defines which modes of operation in the Target mode (→ 145) are available for the function block. The operating modes that are supported vary depending on the type and function of the block.

**User interface**

0 to 255

---

**Mode blk norm**

---

**Navigation**

Expert → Communication → Physical block → Mode blk norm (1492)

**Description**

Displays the Mode blk norm: This is available to allow the operator to select the Mode blk norm from the available modes of operation. This can be set using an operating tool in order to help the user configure the operating mode of a function block.

**User interface**

- Auto
- Out of service

---

**Alarm summary**

---

**Navigation**

Expert → Communication → Physical block → Alarm summary (1474)

**Description**

Displays the alarm summary: the current status of the block alarms is displayed. A summary of up to 16 statuses can be displayed.

**User interface**

- Discrete alarm
- Alm statHiHi lim
- Alrm stat Hi lim
- Alm statLoLo lim
- Alrm stat Lo lim
- Update Event

**Additional information***Description*

Currently, the system only displays a change in a static parameter for 10 seconds, and violations of the early warning and alarm limits in the Physical Block function block.

*User interface*

- Discrete alarm  
Alarm or warning message with a discrete value.
- Alm statHiHi lim  
Upper alarm limit
- Alrm stat Hi lim  
Upper warning limit
- Alm statLoLo lim  
Lower alarm limit
- Alrm stat Lo lim  
Lower warning limit
- Update Event

This option constitutes a special alarm that is triggered if a static parameter is changed. If such a parameter is modified, the associated bit is set in the **Alarm summary** parameter (→ 146), the output of the block switches to "GOOD (NC) Active Update Event" (if the current status has a lower priority than this), and the block remains in this state for a duration of 10 s. The block then reverts to the normal state (the output has the last status and the **Update Event** option bit in the **Alarm summary** parameter (→ 146) is deleted again).

**Software rev.****Navigation**

Expert → Communication → Physical block → Software rev. (1478)

**Description**

Displays the firmware version of the measuring device.

**User interface**

Max. 16 characters such as letters, numbers or special characters (e.g. @, %, /).

**Hardware rev.****Navigation**

Expert → Communication → Physical block → Hardware rev. (1479)

**Description**

Displays the hardware revision of the measuring device.

**User interface**

Max. 16 characters such as letters, numbers or special characters (e.g. @, %, /).

**Manufacturer ID****Navigation**

Expert → Communication → Physical block → Manufacturer ID (1502)

**Description**

Displays the manufacturer ID with which the measuring device has been registered with the PNO (PROFIBUS User Organization).

**User interface** 0 to FFFF

**Factory setting** 0x11

---

## Device ID

---

**Navigation**  Expert → Communication → Physical block → Device ID (1480)

**Description** Displays the device ID for identifying the measuring device in a PROFIBUS network.

**User interface** Max. 16 characters such as letters, numbers or special characters (e.g. @, %, /).

**Factory setting** Promass300/500PA

---

## Serial number

---

**Navigation**  Expert → Communication → Physical block → Serial number (1481)

**Description** Displays the serial number of the measuring device. It can also 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)

---

## Diagnostics

---

**Navigation**  Expert → Communication → Physical block → Diagnostics (1482)

**Description** Displays the diagnostic messages.

**User interface**

- HW Error
- HW Error
- Temp motor
- Electronic temp
- Checksum error
- Measurement error
- Not initialized
- Init. error
- Zero point error
- Power supply
- Conf invalid
- On warmstart

- On coldstart
- Maintenance req.
- Char.invalid
- Ident num Error
- More info avlble
- Mainten. alarm
- Mainten.demanded
- Fct.chk or sim.
- Inval.proc.cond.

---

## Diagnostics mask

---

**Navigation**  Expert → Communication → Physical block → Diagnostics mask (1484)

**Description** Displays the diagnostic messages supported by the measuring device.

**User interface**

- HW Error
- HW Error
- Temp motor
- Electronic temp
- Checksum error
- Measuremnt error
- Not initialized
- Init. error
- Zero point error
- Power supply
- Conf invalid
- On warmstart
- On coldstart
- Maintenance req.
- Char.invalid
- Ident num Error
- More info avlble
- Mainten. alarm
- Mainten.demanded
- Fct.chk or sim.
- Inval.proc.cond.

---

## Device certific.

---

**Navigation**  Expert → Communication → Physical block → Device certific. (1486)

**Description** Displays certificates of the measuring device, e.g. Ex certificate.

**User interface** Max. 32 characters such as letters, numbers or special characters (e.g. @, %, /).

**Factory reset**

**Navigation** Expert → Communication → Physical block → Factory reset (1488)

**Description** Use this function to reset a certain set of parameters in a block.

- Selection**
- to defaults \*
  - warmstart device
  - reset bus addr
  - Cancel

**Factory setting** Cancel

**Descriptor**

**Navigation** Expert → Communication → Physical block → Descriptor (1489)

**Description** Use this function to enter a user-specific string to describe the device within the application.

**User entry** Max. 32 characters such as letters, numbers or special characters (e.g. @, %, /).

**Device message**

**Navigation** Expert → Communication → Physical block → Device message (1490)

**Description** Use this function to enter a user-definable message (a string) to describe the device within the application or in the plant.

**User entry** Max. 32 Zeichen wie Buchstaben, Zahlen oder Sonderzeichen (z.B. @, %, /).

**Device inst.date**

**Navigation** Expert → Communication → Physical block → Device inst.date (1491)

**Description** Use this function to enter the date of installation of the device.

**User entry** Max. 16 Zeichen wie Buchstaben, Zahlen oder Sonderzeichen (z.B. @, %, /).

\* Visibility depends on order options or device settings

---

**Ident num select**

**Navigation** Expert → Communication → Physical block → Ident num select (1461)

**Description** Use this function to select the device master file (GSD).

- Selection**
- Automatic mode
  - Manufacturer
  - Profile
  - 1AI,1Tot(0x9740)
  - 2AI,1Tot(0x9741)
  - Promass 80
  - Promass 83

**Factory setting** Automatic mode

**Additional information** *Description*

In order to integrate the field devices into the bus system, the PROFIBUS system needs a description of the device parameters, such as output data, input data, data format, data volume and supported transmission rate. These data are available in the device master file (GSD) which is provided to the PROFIBUS Master when the communication system is commissioned.

---

**Hardware lock**

**Navigation** Expert → Communication → Physical block → Hardware lock (1499)

**Description** Displays the hardware write protection.

- User interface**
- Unprotected
  - Protected

**Additional information** *Description*

Indicates whether it is possible to write-access the measuring device via PROFIBUS (acyclic data transmission, e.g. via the "FieldCare" operating program).

For detailed information on hardware write protection, see the "Write protection via write protection switch" section of the Operating Instructions.

*User interface*

- Unprotected  
Write access via PROFIBUS is possible (acyclic data transmission).
- Protected  
Write access via PROFIBUS is locked (acyclic data transmission).

---

## Feature support

---

**Navigation**  Expert → Communication → Physical block → Feature support (1477)

**Description** Displays the PROFIBUS features that are supported by the measuring device.

**User interface**

- Condensed status
- Classic diag
- Data ex.broad.
- MS1 app.relation
- PROFIsafe comm.

---

## Feature enabled

---

**Navigation**  Expert → Communication → Physical block → Feature enabled (1476)

**Description** Displays the PROFIBUS features that are enabled in the measuring device.

**User interface**

- Condensed status
- Classic diag
- Data ex.broad.
- MS1 app.relation
- PROFIsafe comm.

---

## Condensed status

---



**Navigation**  Expert → Communication → Physical block → Condensed status (1500)

**Description** Use this function to switch the condensed status diagnostic on and off.

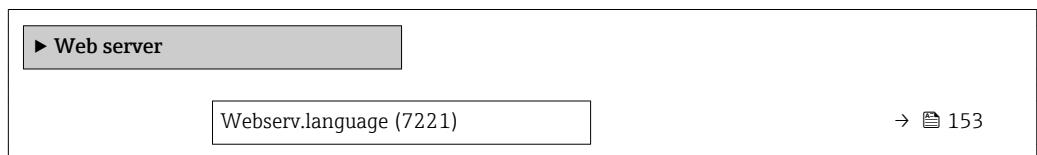
**Selection**

- Off
- On

**Factory setting** On

### 3.6.4 "Web server" submenu

*Navigation*  Expert → Communication → Web server



MAC Address (7214)	→  153
DHCP client (7212)	→  154
IP address (7209)	→  154
Subnet mask (7211)	→  154
Default gateway (7210)	→  155
Webserver funct. (7222)	→  155
Login page (7273)	→  155

---

## Webserv.language

---

**Navigation** Expert → Communication → Web server → Webserv.language (7221)**Description** Use this function to select the Web server language setting.**Selection**

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

**Factory setting** English

---

## MAC Address

---

**Navigation** Expert → Communication → Web server → MAC Address (7214)**Description** Displays the MAC<sup>8)</sup> address of the measuring device.

---

8) Media Access Control

**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

---

## DHCP client



**Navigation** Expert → Communication → Web server → DHCP client (7212)

**Description** Use this function to activate and deactivate the DHCP client functionality.

**Selection**  
▪ Off  
▪ On

**Factory setting** Off

**Additional information** *Result*

If the DHCP client functionality of the Web server is activated, the IP address (→ 154), Subnet mask (→ 154) and Default gateway (→ 155) are set automatically.

Identification is via the MAC address of the measuring device.

---

## IP address



**Navigation** Expert → Communication → Web server → IP address (7209)

**Description** Display or enter the IP address of the Web server integrated in the measuring device.

**User entry** 4 octet: 0 to 255 (in the particular octet)

**Factory setting** 192.168.1.212

**Additional information**

---

## Subnet mask



**Navigation** Expert → Communication → Web server → Subnet mask (7211)

**Description** Display or enter the subnet mask.

**User entry** 4 octet: 0 to 255 (in the particular octet)

**Factory setting** 255.255.255.0

## Default gateway



**Navigation** Expert → Communication → Web server → Default gateway (7210)

**Description** Display or enter the Default gateway (→ 155).

**User entry** 4 octet: 0 to 255 (in the particular octet)

**Factory setting** 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

### 3.6.5 "WLAN settings" submenu

*Navigation*

Expert → Communication → WLAN settings

► WLAN settings		
WLAN (2702)		→  157
WLAN mode (2717)		→  157
SSID name (2714)		→  157
Network security (2705)		→  158
Sec. identific. (2718)		→  158
User name (2715)		→  158
WLAN password (2716)		→  159
WLAN IP address (2711)		→  159
WLAN MAC address (2703)		→  159
WLAN subnet mask (2709)		→  159
WLAN MAC address (2703)		→  159
WLAN passphrase (2706)		→  160
Assign SSID name (2708)		→  160
SSID name (2707)		→  160
WLAN channel (2704)		→  161
Select antenna (2713)		→  161
Connection state (2722)		→  161
Rec.sig.strength (2721)		→  162

WLAN IP address (2711)	→  159
Gateway IP addr. (2719)	→  162
IP address DNS (2720)	→  162

**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>9)</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)

---

9) Media Access Control

---

Factory setting	255.255.255.0
-----------------	---------------

---

## WLAN passphrase



Navigation	Expert → Communication → WLAN settings → WLAN passphrase (2706)
Prerequisite	The <b>WPA2-PSK</b> option is selected in the <b>Security type</b> parameter (→  158).
Description	Use this function to enter the network key.
User entry	8 to 32-digit character string comprising numbers, letters and special characters
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>10)</sup> .
Selection	<ul style="list-style-type: none"><li>■ Device tag</li><li>■ User-defined</li></ul>
Factory setting	User-defined
Additional information	<i>Selection</i> <ul style="list-style-type: none"><li>■ Device tag The device tag name is used as the SSID.</li><li>■ User-defined A user-defined name is used as the SSID.</li></ul>

---

## SSID name



Navigation	Expert → Communication → WLAN settings → SSID name (2707)
Prerequisite	<ul style="list-style-type: none"><li>■ The <b>User-defined</b> option is selected in the <b>Assign SSID name</b> parameter (→  160) parameter.</li><li>■ The <b>Access point</b> option is selected in the <b>WLAN mode</b> parameter (→  157) parameter.</li></ul>
Description	Use this function to enter a user-defined SSID name.
User entry	Max. 32-digit character string comprising numbers, letters and special characters

---

10) Service Set Identifier

---

<b>Factory setting</b>	EH_device designation_last 7 digits of the serial number (e.g. EH_Cubemass_500_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

---

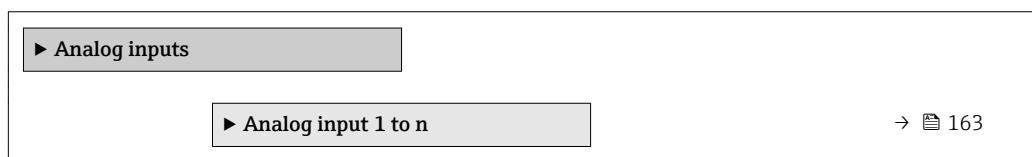
**IP address DNS**

---

<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 "Analog inputs" submenu

*Navigation*        Expert → Analog inputs



### 3.7.1 "Analog input 1 to n" submenu

Navigation



Expert → Analog inputs → Analog input 1 to n

► Analog input 1 to n	
Channel (1561-1 to n)	→  163
PV filter time (1524-1 to n)	→  164
Fail safe type (1525-1 to n)	→  164
Fail-safe value (1526-1 to n)	→  164
Out value (1552-1 to n)	→  165
Out status (1564-1 to n)	→  165
Out status (1549-1 to n)	→  165

#### Channel



Navigation

Expert → Analog inputs → Analog input 1 to n → Channel (1561-1 to n)

Description

For selecting the process variable.

Selection

- Mass flow
- Volume flow
- Correct.vol.flow \*
- Density
- Ref.density \*
- Target mass flow \*
- Carrier mass fl. \*
- Concentration \*
- Target vol. flow \*
- Carrier vol. fl.
- Targ.corr.vol.fl \*
- Carr.corr.vol.fl \*
- Temperature
- Carr. pipe temp. \*
- Electronic temp.
- Osc. freq. 0
- Freq. fluct. 0 \*
- Osc. damping 0 \*
- Osc.damp.fluct 0 \*
- Osc.damp.fluct 1 \*
- Signal asymmetry \*
- Exc. current 0 \*
- Current input 1 \*

\* Visibility depends on order options or device settings

---

Factory setting	Mass flow
-----------------	-----------

---

PV filter time	
----------------	---

**Navigation**  Expert → Analog inputs → Analog input 1 to n → PV filter time (1524–1 to n)

**Description** Use this function to enter a time to suppress signal peaks. During the specified time the Analog input does not respond to an erratic increase in the process variable.

**User entry** Positive floating-point number

**Factory setting** 0

---

Fail safe type	
----------------	---

**Navigation**  Expert → Analog inputs → Analog input 1 to n → Fail safe type (1525–1 to n)

**Description** Use this function to select the failure mode.

**Selection**

- Fail-safe value
- Fallback value
- Off

**Factory setting** Off

**Additional information** *Selection*

If an input or simulation value has the status BAD, the function block uses this predefined failure value:

- Fail-safe value  
A substitute value is used. This is specified in the **Fail-safe value** parameter (→ [164](#)).
- Fallback value  
If the value was good at one point, then this last valid value is used.
- Off  
The system continues to use the bad value.

---

Fail-safe value	
-----------------	---

**Navigation**  Expert → Analog inputs → Analog input 1 to n → Fail-safe value (1526–1 to n)

**Prerequisite** In **Fail safe type** parameter (→ [164](#)), the **Fail-safe value** option is selected.

**Description** Use this function to enter a failure value. The value entered is displayed as the output value (**Out value** parameter (→ [165](#))) in the event of an error.

**User entry** Signed floating-point number

---

Factory setting	0
-----------------	---

---

#### Out value

---

Navigation	  Expert → Analog inputs → Analog input 1 to n → Out value (1552–1 to n)
Prerequisite	In <b>Target mode</b> parameter (→ 166), the <b>Auto</b> option is selected.
Description	Displays the analog value which is calculated when the function is executed.
User interface	Signed floating-point number

---

#### Out status

---

Navigation	  Expert → Analog inputs → Analog input 1 to n → Out status (1564–1 to n)
Description	Displays the current output status (Good, Bad, Uncertain).
User interface	<ul style="list-style-type: none"><li>■ Good</li><li>■ Uncertain</li><li>■ Bad</li></ul>

---

#### Out status

---

Navigation	  Expert → Analog inputs → Analog input 1 to n → Out status (1549–1 to n)
Prerequisite	In <b>Target mode</b> parameter (→ 166), the <b>Auto</b> option is selected.
Description	Displays the current output status (hex value).
User interface	0 to 0xFF

---

#### Tag description

---

Navigation	 Expert → Analog inputs → Analog input 1 to n → Tag description (1562–1 to n)
Description	Use this function to enter a string to identify the block.
User entry	Max. 32 characters such as letters, numbers or special characters (e.g. @, %, /).

---

## Static revision

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → Static revision (1560–1 to n)
<b>Description</b>	Displays the event counter: every write access to a static block parameter is counted.
<b>User interface</b>	0 to FFFF
<b>Additional information</b>	<i>Description</i>  Static parameters are parameters that are not changed by the process.

---

## Strategy

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → Strategy (1559–1 to n)
<b>Description</b>	Use this function to enter the strategy: makes it possible to group blocks by entering identical numbers.
<b>User entry</b>	0 to FFFF
<b>Factory setting</b>	0

---

## Alert key

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → Alert key (1522–1 to n)
<b>Description</b>	Use this function to enter the alert key: identifies the section of the plant where the transmitter is located. This helps in pinpointing events.
<b>User entry</b>	0 to 0xFF
<b>Factory setting</b>	0

---

## Target mode

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → Target mode (1563–1 to n)
<b>Description</b>	Displays the Target mode: The target mode indicates which mode of operation is used for this function block. This mode is generally set by a control application.
<b>User interface</b>	<ul style="list-style-type: none"><li>■ Auto</li><li>■ Man</li><li>■ Out of service</li></ul>

---

## Mode block act

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → Mode block act (1521–1 to n)
<b>Description</b>	Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→  166).
<b>User interface</b>	<ul style="list-style-type: none"><li>▪ Auto</li><li>▪ Man</li><li>▪ Out of service</li></ul>
<b>Additional information</b>	<p><i>Description</i></p> <p> A comparison of the current mode with the target mode (<b>Target mode</b> parameter (→  166)) indicates whether it was possible to reach the target mode.</p>

---

## Mode block perm

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → Mode block perm (1553–1 to n)
<b>Description</b>	Displays the Mode block perm: This defines which modes of operation in the Target mode (→  166) are available for the function block. The operating modes that are supported vary depending on the type and function of the block.
<b>User interface</b>	0 to 255

---

## Mode blk norm

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → Mode blk norm (1546–1 to n)
<b>Description</b>	Displays the Mode blk norm: This is available to allow the operator to select the Mode blk norm from the available modes of operation. This can be set using an operating tool in order to help the user configure the operating mode of a function block.
<b>User interface</b>	<ul style="list-style-type: none"><li>▪ Auto</li><li>▪ Man</li><li>▪ Out of service</li></ul>

---

## Alarm summary

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → Alarm summary (1537–1 to n)
<b>Description</b>	Displays the alarm summary: the current status of the block alarms is displayed. A summary of up to 16 statuses can be displayed.

**User interface**

- Discrete alarm
- Alm statHiHi lim
- Alarm stat Hi lim
- Alm statLoLo lim
- Alarm stat Lo lim
- Update Event

**Additional information***Description*

 Currently, the system only displays a change in a static parameter for 10 seconds, and violations of the early warning and alarm limits in the Analog Inputs function block.

---

**Batch ID****Navigation**

 Expert → Analog inputs → Analog input 1 to n → Batch ID (1533–1 to n)

**Description**

Use this function to enter the batch ID: identification of a specific batch to make it possible to assign device-specific information (e.g. errors, alarm conditions etc.) to the batching process.

**User entry**

Positive integer

---

**Batch operation****Navigation**

 Expert → Analog inputs → Analog input 1 to n → Batch operation (1534–1 to n)

**Description**

Use this function to enter the batch operation: control recipe operation number to identify the active control recipe operation.

**User entry**

0 to 65 535

**Factory setting**

0

---

**Batch phase****Navigation**

 Expert → Analog inputs → Analog input 1 to n → Batch phase (1535–1 to n)

**Description**

Use this function to enter the batch phase: control recipe phase number to identify the active control recipe operation.

**User entry**

0 to 65 535

**Factory setting**

0

**Batch Recipe**

<b>Navigation</b>	Expert → Analog inputs → Analog input 1 to n → Batch Recipe (1536–1 to n)
<b>Description</b>	Use this function to enter the batch recipe unit procedure (RUP): identification of the active control recipe unit procedure or the associated unit (e.g. inductor, centrifuge, drying agent).
<b>User entry</b>	0 to 65 535
<b>Factory setting</b>	0
<b>Additional information</b>	<i>Description</i> The unit is defined in IEC61512 Part1/ISA S88 but its meaning is different to that of the parameter unit, such as system units.

**PVscale lo range**

<b>Navigation</b>	Expert → Analog inputs → Analog input 1 to n → PVscale lo range (1554–1 to n)
<b>Description</b>	Use this function to enter the lower value range for the input value (Process Value Scale) in system units. The process value scale normalizes the input value to a user-specific range.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	0

**PVscale up range**

<b>Navigation</b>	Expert → Analog inputs → Analog input 1 to n → PVscale up range (1555–1 to n)
<b>Description</b>	Use this function to enter the upper value range for the input value (Process Value Scale) in system units. The process value scale normalizes the input value to a user-specific range.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	100.0

**Out scale low**

<b>Navigation</b>	Expert → Analog inputs → Analog input 1 to n → Out scale low (1548–1 to n)
<b>Description</b>	Use this function to enter the lower value range for the output value in system units.

**User entry** Signed floating-point number

**Factory setting** 0

---

#### Out scale up



**Navigation** ☐ Expert → Analog inputs → Analog input 1 to n → Out scale up (1551–1 to n)

**Description** Use this function to enter the upper value range for the output value in system units.

**User entry** Signed floating-point number

**Factory setting** 100.0

---

#### Lin type



**Navigation** ☐ Expert → Analog inputs → Analog input 1 to n → Lin type (1523–1 to n)

**Description** Use this function to switch off the linearization type for the input value.

**Selection** Off

**Factory setting** Off

---

#### Out unit



**Navigation** ☐ Expert → Analog inputs → Analog input 1 to n → Out unit (1550–1 to n)

**Description** Use this function to enter a numerical code (hex) for the system unit.

**User entry** 0 to 65 535

**Factory setting** 1997

---

#### Out dec\_point



**Navigation** ☐ Expert → Analog inputs → Analog input 1 to n → Out dec\_point (1547–1 to n)

**Description** Use this function to enter the maximum number of decimal places that are displayed for the output value.

**User entry** 0 to 7

---

<b>Factory setting</b>	0
------------------------	---

---

**Alarm hysteresis**

<b>Navigation</b>	█ Expert → Analog inputs → Analog input 1 to n → Alarm hysteresis (1527–1 to n)
<b>Description</b>	Use this function to enter the hysteresis value for the upper and lower warning or alarm limit values.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	0

---

**Hi Hi Lim**

<b>Navigation</b>	█ Expert → Analog inputs → Analog input 1 to n → Hi Hi Lim (1528–1 to n)
<b>Description</b>	Use this function to enter the value for the upper alarm limit ( <b>HiHi alarm value</b> parameter (→ █ 173)).
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	Positive floating-point number
<b>Additional information</b>	<p><i>Description</i></p> <p><b>i</b> If the output value Out value (→ █ 165) exceeds this limit value, the <b>HiHi alarm state</b> parameter (→ █ 173) is output.</p> <p><i>User entry</i></p> <p><b>i</b> The value is entered in the defined units (<b>Out unit</b> parameter (→ █ 170)) and must be in the range defined in the <b>Out scale low</b> parameter (→ █ 169) and <b>Out scale up</b> parameter (→ █ 170).</p>

---

**Hi Lim**

<b>Navigation</b>	█ Expert → Analog inputs → Analog input 1 to n → Hi Lim (1529–1 to n)
<b>Description</b>	Use this function to enter the value for the upper warning limit ( <b>Hi alarm value</b> parameter (→ █ 173)).
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	Positive floating-point number

**Additional information***Description*

**i** If the output value Out value (→ 165) exceeds this limit value, the **Hi alarm state** parameter (→ 173) is output.

*User entry*

**i** The value is entered in the defined units (**Out unit** parameter (→ 170)) and must be in the range defined in the **Out scale low** parameter (→ 169) and **Out scale up** parameter (→ 170).

---

**Lo Lim****Navigation**

█ Expert → Analog inputs → Analog input 1 to n → Lo Lim (1530–1 to n)

**Description**

Use this function to enter the value for the lower warning limit (**Lo alarm value** parameter (→ 174)).

**User entry**

Signed floating-point number

**Factory setting**

Negative floating-point number

**Additional information***Description*

**i** If the output value Out value (→ 165) exceeds this limit value, the **Lo alarm state** parameter (→ 174) is output.

*User entry*

**i** The value is entered in the defined units (**Out unit** parameter (→ 170)) and must be in the range defined in the **Out scale low** parameter (→ 169) and **Out scale up** parameter (→ 170).

---

**Lo Lo Lim****Navigation**

█ Expert → Analog inputs → Analog input 1 to n → Lo Lo Lim (1531–1 to n)

**Description**

Use this function to enter the value for the lower alarm limit (**LoLo alarm value** parameter (→ 174)).

**User entry**

Signed floating-point number

**Factory setting**

Negative floating-point number

**Additional information***Description*

**i** If the output value Out value (→ 165) exceeds this limit value, the **LoLo alarm state** parameter (→ 174) is output.

*User entry*

**i** The value is entered in the defined units (**Out unit** parameter (→ 170)) and must be in the range defined in the **Out scale low** parameter (→ 169) and **Out scale up** parameter (→ 170).

---

**HiHi alarm value**

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → HiHi alarm value (1541–1 to n)
<b>Description</b>	Displays the alarm value for the upper alarm limit value ( <b>Hi Hi Lim</b> parameter (→  171)).
<b>User interface</b>	Signed floating-point number

---

**HiHi alarm state**

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → HiHi alarm state (1540–1 to n)
<b>Description</b>	Displays the status for the upper alarm limit value ( <b>Hi Hi Lim</b> parameter (→  171)).
<b>User interface</b>	<ul style="list-style-type: none"><li>■ No alarm</li><li>■ Alm statHiHi lim</li></ul>
<b>Additional information</b>	<i>User interface</i>  The display contains information such as the time of the alarm (date and time) and the value that triggered the alarm.

---

**Hi alarm value**

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → Hi alarm value (1539–1 to n)
<b>Description</b>	Displays the alarm value for the upper warning limit value ( <b>Hi Lim</b> parameter (→  171)).
<b>User interface</b>	Signed floating-point number

---

**Hi alarm state**

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → Hi alarm state (1538–1 to n)
<b>Description</b>	Displays the status for the upper warning limit value ( <b>Hi Lim</b> parameter (→  171)).
<b>User interface</b>	<ul style="list-style-type: none"><li>■ No warning</li><li>■ Alrm stat Hi lim</li></ul>
<b>Additional information</b>	<i>User interface</i>  The display contains information such as the time of the warning (date and time) and the value that triggered the alarm.

---

## Lo alarm value

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → Lo alarm value (1543–1 to n)
<b>Description</b>	Displays the alarm value for the lower warning limit value ( <b>Lo Lim</b> parameter (→ <a href="#">172</a> )).
<b>User interface</b>	Signed floating-point number

---

## Lo alarm state

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → Lo alarm state (1542–1 to n)
<b>Description</b>	Displays the status for the lower warning limit value ( <b>Lo Lim</b> parameter (→ <a href="#">172</a> )).
<b>User interface</b>	<ul style="list-style-type: none"><li>■ No warning</li><li>■ Alrm stat Lo lim</li></ul>
<b>Additional information</b>	<i>User interface</i>
	 The display contains information such as the time of the warning (date and time) and the value that triggered the alarm.

---

## LoLo alarm value

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → LoLo alarm value (1545–1 to n)
<b>Description</b>	Displays the alarm value for the lower alarm limit value ( <b>Lo Lo Lim</b> parameter (→ <a href="#">172</a> )).
<b>User interface</b>	Signed floating-point number

---

## LoLo alarm state

---

<b>Navigation</b>	 Expert → Analog inputs → Analog input 1 to n → LoLo alarm state (1544–1 to n)
<b>Description</b>	Displays the status for the lower alarm limit value ( <b>Lo Lo Lim</b> parameter (→ <a href="#">172</a> )).
<b>User interface</b>	<ul style="list-style-type: none"><li>■ No alarm</li><li>■ Alm statLoLo lim</li></ul>
<b>Additional information</b>	<i>User interface</i>
	 The display contains information such as the time of the alarm (date and time) and the value that triggered the alarm.

---

**Simulate enabled**

<b>Navigation</b>	Expert → Analog inputs → Analog input 1 to n → Simulate enabled (1556–1 to n)
<b>Description</b>	Use this function to enable or disable block simulation.
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Disable</li><li>■ Enable</li></ul>
<b>Factory setting</b>	Disable
<b>Additional information</b>	<i>Description</i> The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated discrete I/O channel during operation.

---

**Simulate value**

<b>Navigation</b>	Expert → Analog inputs → Analog input 1 to n → Simulate value (1558–1 to n)
<b>Description</b>	Use this function to enter a simulation value for the block.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	0
<b>Additional information</b>	<i>Description</i> The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated value during operation.

---

**Simulate status**

<b>Navigation</b>	Expert → Analog inputs → Analog input 1 to n → Simulate status (1557–1 to n)
<b>Description</b>	Use this function to enter a simulation status for the block.
<b>User entry</b>	0 to 255
<b>Factory setting</b>	0
<b>Additional information</b>	<i>Description</i> The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated status during operation.

**Out unit text****Navigation**

█ Expert → Analog inputs → Analog input 1 to n → Out unit text (1532–1 to n)

**Description**

Use this function to enter the out unit text: if a specific out unit does not appear in the code list, the user can enter the specific text. The unit code is then equivalent to the definition provided here.

**User entry**

Max. 16 characters such as letters, numbers or special characters (e.g. @, %, /).

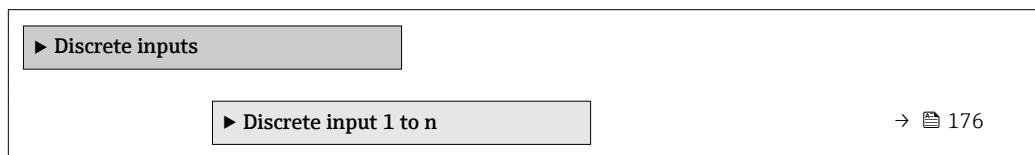
**Factory setting**

NoUnit

## 3.8 "Discrete inputs" submenu

**Navigation**

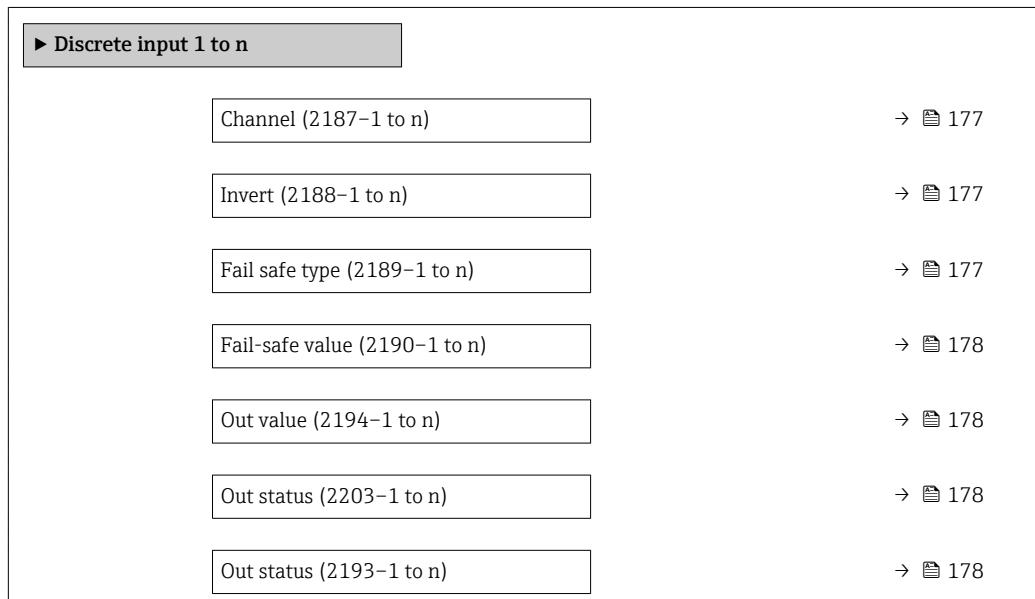
█ █ Expert → Discrete inputs



### 3.8.1 "Discrete input 1 to n" submenu

**Navigation**

█ █ Expert → Discrete inputs → Discrete input 1 to n



**Channel**

**Navigation** Expert → Discrete inputs → Discrete input 1 to n → Channel (2187–1 to n)

**Description** Use this function to assign a measured variable to the particular function block.

**Selection**

- Empty pipe det.
- Low flow cut off
- Verific. status \*

**Factory setting** Empty pipe det.

**Invert**

**Navigation** Expert → Discrete inputs → Discrete input 1 to n → Invert (2188–1 to n)

**Description** Use this function to invert the input signal.

**Selection**

- Off
- On

**Factory setting** Off

**Fail safe type**

**Navigation** Expert → Discrete inputs → Discrete input 1 to n → Fail safe type (2189–1 to n)

**Description** Use this function to select the failure mode.

**Selection**

- Fail-safe value
- Fallback value
- Off

**Factory setting** Off

**Additional information** *Selection*

If an input or simulation value has the status BAD, the function block uses this predefined failure value:

- Fail-safe value  
A substitute value is used. This is specified in the **Fail-safe value** parameter (→ 178).
- Fallback value  
If the value was good at one point, then this last valid value is used.
- Off  
The system continues to use the bad value.

\* Visibility depends on order options or device settings

---

**Fail-safe value**

<b>Navigation</b>	Expert → Discrete inputs → Discrete input 1 to n → Fail-safe value (2190-1 to n)
<b>Prerequisite</b>	In <b>Fail safe type</b> parameter (→ 177), the <b>Fail-safe value</b> option is selected.
<b>Description</b>	Use this function to enter a failure value. The value entered is displayed as the output value ( <b>Out value</b> parameter (→ 178)) in the event of an error.
<b>User entry</b>	0 to 255
<b>Factory setting</b>	0

---

**Out value**

<b>Navigation</b>	Expert → Discrete inputs → Discrete input 1 to n → Out value (2194-1 to n)
<b>Prerequisite</b>	In <b>Target mode</b> parameter (→ 180), the <b>Auto</b> option is selected.
<b>Description</b>	Displays the analog value which is calculated when the function is executed.
<b>User interface</b>	0 to 255

---

**Out status**

<b>Navigation</b>	Expert → Discrete inputs → Discrete input 1 to n → Out status (2203-1 to n)
<b>Description</b>	Displays the current output status (Good, Bad, Uncertain).
<b>User interface</b>	<ul style="list-style-type: none"><li>■ Good</li><li>■ Uncertain</li><li>■ Bad</li></ul>

---

**Out status**

<b>Navigation</b>	Expert → Discrete inputs → Discrete input 1 to n → Out status (2193-1 to n)
<b>Prerequisite</b>	In <b>Target mode</b> parameter (→ 180), the <b>Auto</b> option is selected.
<b>Description</b>	Displays the current output status (hex value).
<b>User interface</b>	0 to 0xFF

---

**Tag description**

<b>Navigation</b>	Expert → Discrete inputs → Discrete input 1 to n → Tag description (2201–1 to n)
<b>Description</b>	Use this function to enter a string to identify the block.
<b>User entry</b>	Max. 32 characters such as letters, numbers or special characters (e.g. @, %, /).

---

**Static revision**

<b>Navigation</b>	Expert → Discrete inputs → Discrete input 1 to n → Static revision (2200–1 to n)
<b>Description</b>	Displays the event counter: every write access to a static block parameter is counted.
<b>User interface</b>	0 to FFFF
<b>Additional information</b>	<i>Description</i>
	Static parameters are parameters that are not changed by the process.

---

**Strategy**

<b>Navigation</b>	Expert → Discrete inputs → Discrete input 1 to n → Strategy (2199–1 to n)
<b>Description</b>	Use this function to enter the strategy: makes it possible to group blocks by entering identical numbers.
<b>User entry</b>	0 to FFFF
<b>Factory setting</b>	0

---

**Alert key**

<b>Navigation</b>	Expert → Discrete inputs → Discrete input 1 to n → Alert key (2182–1 to n)
<b>Description</b>	Use this function to enter the alert key: identifies the section of the plant where the transmitter is located. This helps in pinpointing events.
<b>User entry</b>	0 to 0xFF
<b>Factory setting</b>	0

## Target mode



**Navigation** Expert → Discrete inputs → Discrete input 1 to n → Target mode (2202-1 to n)

**Description** Displays the Target mode: The target mode indicates which mode of operation is used for this function block. This mode is generally set by a control application.

**User interface**

- Auto
- Man
- Out of service

## Mode block act

**Navigation** Expert → Discrete inputs → Discrete input 1 to n → Mode block act (2181-1 to n)

**Description** Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→ 180).

**User interface**

- Auto
- Man
- Out of service

**Additional information**

*Description*

A comparison of the current mode with the target mode (**Target mode** parameter (→ 180)) indicates whether it was possible to reach the target mode.

## Mode block perm

**Navigation** Expert → Discrete inputs → Discrete input 1 to n → Mode block perm (2195-1 to n)

**Description** Displays the Mode block perm: This defines which modes of operation in the Target mode (→ 180) are available for the function block. The operating modes that are supported vary depending on the type and function of the block.

**User interface**

0 to 255

## Mode blk norm

**Navigation** Expert → Discrete inputs → Discrete input 1 to n → Mode blk norm (2192-1 to n)

**Description** Displays the Mode blk norm: This is available to allow the operator to select the Mode blk norm from the available modes of operation. This can be set using an operating tool in order to help the user configure the operating mode of a function block.

---

<b>User interface</b>	<ul style="list-style-type: none"> <li>■ Auto</li> <li>■ Man</li> <li>■ Out of service</li> </ul>
-----------------------	---

---

**Alarm summary**

<b>Navigation</b>	 Expert → Discrete inputs → Discrete input 1 to n → Alarm summary (2191–1 to n)
<b>Description</b>	Displays the alarm summary: the current status of the block alarms is displayed. A summary of up to 16 statuses can be displayed.
<b>User interface</b>	<ul style="list-style-type: none"> <li>■ Discrete alarm</li> <li>■ Alm statHiHi lim</li> <li>■ Alrm stat Hi lim</li> <li>■ Alm statLoLo lim</li> <li>■ Alrm stat Lo lim</li> <li>■ Update Event</li> </ul>
<b>Additional information</b>	<p><b>Description</b></p> <p> Currently, the system only displays a change in a static parameter for 10 seconds, and violations of the early warning and alarm limits in the Discrete Inputs function block.</p>

---

**Batch ID**

<b>Navigation</b>	 Expert → Discrete inputs → Discrete input 1 to n → Batch ID (2183–1 to n)
<b>Description</b>	Use this function to enter the batch ID: identification of a specific batch to make it possible to assign device-specific information (e.g. errors, alarm conditions etc.) to the batching process.
<b>User entry</b>	Positive integer

---

**Batch operation**

<b>Navigation</b>	 Expert → Discrete inputs → Discrete input 1 to n → Batch operation (2184–1 to n)
<b>Description</b>	Use this function to enter the batch operation: control recipe operation number to identify the active control recipe operation.
<b>User entry</b>	0 to 65 535
<b>Factory setting</b>	0

**Batch phase**

**Navigation** Expert → Discrete inputs → Discrete input 1 to n → Batch phase (2185–1 to n)

**Description** Use this function to enter the batch phase: control recipe phase number to identify the active control recipe operation.

**User entry** 0 to 65 535

**Factory setting** 0

**Batch Recipe**

**Navigation** Expert → Discrete inputs → Discrete input 1 to n → Batch Recipe (2186–1 to n)

**Description** Use this function to enter the batch recipe unit procedure (RUP): identification of the active control recipe unit procedure or the associated unit (e.g. inductor, centrifuge, drying agent).

**User entry** 0 to 65 535

**Factory setting** 0

**Additional information** *Description*

The unit is defined in IEC61512 Part1/ISA S88 but its meaning is different to that of the parameter unit, such as system units.

**Simulate enabled**

**Navigation** Expert → Discrete inputs → Discrete input 1 to n → Simulate enabled (2196–1 to n)

**Description** Use this function to enable or disable block simulation.

**Selection**

- Disable
- Enable

**Factory setting** Disable

**Additional information** *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated discrete I/O channel during operation.

**Simulate value**

<b>Navigation</b>	☒ Expert → Discrete inputs → Discrete input 1 to n → Simulate value (2198-1 to n)
<b>Description</b>	Use this function to enter a simulation value for the block.
<b>User entry</b>	0 to 255
<b>Factory setting</b>	0
<b>Additional information</b>	<p><i>Description</i></p> <p>The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated value during operation.</p>

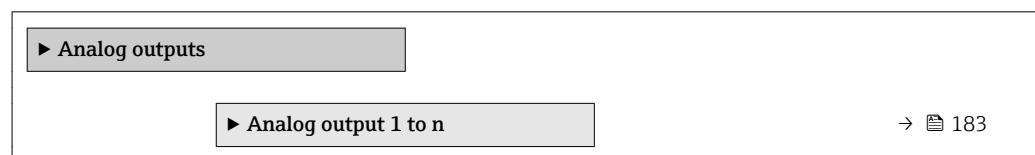
**Simulate status**

<b>Navigation</b>	☒ Expert → Discrete inputs → Discrete input 1 to n → Simulate status (2197-1 to n)
<b>Description</b>	Use this function to enter a simulation status for the block.
<b>User entry</b>	0 to 255
<b>Factory setting</b>	0
<b>Additional information</b>	<p><i>Description</i></p> <p>The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated status during operation.</p>

### 3.9 "Analog outputs" submenu

*Navigation*

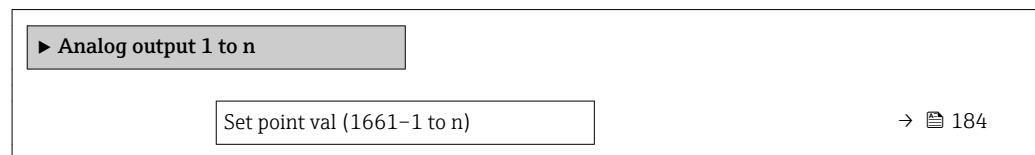
☒☒ Expert → Analog outputs



#### 3.9.1 "Analog output 1 to n" submenu

*Navigation*

☒☒ Expert → Analog outputs → Analog output 1 to n



Set point status (1660-1 to n)	→  184
Fail safe time (1635-1 to n)	→  184
Fail safe type (1636-1 to n)	→  185
Fail-safe value (1637-1 to n)	→  185
Out value (1647-1 to n)	→  186
Out status (1669-1 to n)	→  186
Out status (1645-1 to n)	→  186

**Set point val**

**Navigation** Expert → Analog outputs → Analog output 1 to n → Set point val (1661-1 to n)

**Description** Use this function to enter an analog set point.

**User entry** Signed floating-point number

**Factory setting** 0

**Set point status**

**Navigation** Expert → Analog outputs → Analog output 1 to n → Set point status (1660-1 to n)

**Description** Use this function to enter a status for the analog set point.

**User entry** 0 to 255

**Factory setting** 0

**Fail safe time**

**Navigation** Expert → Analog outputs → Analog output 1 to n → Fail safe time (1635-1 to n)

**Description** Use this function to enter a time span within which the criteria for an error must be met continuously before an error message or notice message is generated.

**User entry** 0 to 999.0

**Factory setting** 0

**Additional information***User entry***NOTE!**

If this parameter is used, error messages and notice messages are delayed by the set time before being relayed to the higher-level controller (DCS, etc.).

- ▶ Check in advance to ensure that the safety-specific requirements of the process would permit this.
- ▶ If the error and notice messages may not be suppressed, a value of 0 seconds must be configured here.

**Fail safe type****Navigation**
 Expert → Analog outputs → Analog output 1 to n → Fail safe type (1636–1 to n)
**Description**

Use this function to select the failure mode.

**Selection**

- Fail-safe value
- Fallback value
- Off

**Factory setting**

Fallback value

**Additional information**

*Selection*

If an input or simulation value has the status BAD, the function block uses this predefined failure value:

- Fail-safe value  
A substitute value is used. This is specified in the **Fail-safe value** parameter (→ 185).
- Fallback value  
If the value was good at one point, then this last valid value is used.
- Off  
The system continues to use the bad value.

**Fail-safe value****Navigation**
 Expert → Analog outputs → Analog output 1 to n → Fail-safe value (1637–1 to n)
**Prerequisite**

In **Fail safe type** parameter (→ 185), the **Fallback value** option is selected.

**Description**

Use this function to enter a failure value. The value entered is displayed as the output value (**Out value** parameter (→ 186)) in the event of an error.

**User entry**

Signed floating-point number

**Factory setting**

0

---

**Out value**

---

<b>Navigation</b>	  Expert → Analog outputs → Analog output 1 to n → Out value (1647–1 to n)
<b>Prerequisite</b>	In <b>Target mode</b> parameter (→ <a href="#">187</a> ), the <b>Auto</b> option is selected.
<b>Description</b>	Displays the analog value which is calculated when the function is executed.
<b>User interface</b>	Signed floating-point number

---

**Out status**

---

<b>Navigation</b>	  Expert → Analog outputs → Analog output 1 to n → Out status (1669–1 to n)
<b>Description</b>	Displays the current output status (Good, Bad, Uncertain).
<b>User interface</b>	<ul style="list-style-type: none"><li>■ Good</li><li>■ Uncertain</li><li>■ Bad</li></ul>

---

**Out status**

---

<b>Navigation</b>	  Expert → Analog outputs → Analog output 1 to n → Out status (1645–1 to n)
<b>Prerequisite</b>	In <b>Target mode</b> parameter (→ <a href="#">187</a> ), the <b>Auto</b> option is selected.
<b>Description</b>	Displays the current output status (hex value).
<b>User interface</b>	0 to 0xFF

---

**Tag description**

---



<b>Navigation</b>	 Expert → Analog outputs → Analog output 1 to n → Tag description (1667–1 to n)
<b>Description</b>	Use this function to enter a string to identify the block.
<b>User entry</b>	Max. 32 characters such as letters, numbers or special characters (e.g. @, %, /).

---

## Static revision

---

<b>Navigation</b>	 Expert → Analog outputs → Analog output 1 to n → Static revision (1666–1 to n)
<b>Description</b>	Displays the event counter: every write access to a static block parameter is counted.
<b>User interface</b>	0 to FFFF
<b>Additional information</b>	<i>Description</i>  Static parameters are parameters that are not changed by the process.

---

## Strategy

---



<b>Navigation</b>	 Expert → Analog outputs → Analog output 1 to n → Strategy (1665–1 to n)
<b>Description</b>	Use this function to enter the strategy: makes it possible to group blocks by entering identical numbers.
<b>User entry</b>	0 to FFFF
<b>Factory setting</b>	0

---

## Alert key

---



<b>Navigation</b>	 Expert → Analog outputs → Analog output 1 to n → Alert key (1632–1 to n)
<b>Description</b>	Use this function to enter the alert key: identifies the section of the plant where the transmitter is located. This helps in pinpointing events.
<b>User entry</b>	0 to 0xFF
<b>Factory setting</b>	0

---

## Target mode

---



<b>Navigation</b>	 Expert → Analog outputs → Analog output 1 to n → Target mode (1668–1 to n)
<b>Description</b>	Displays the Target mode: The target mode indicates which mode of operation is used for this function block. This mode is generally set by a control application.

**User interface**

- Auto
- Local override
- Man
- Out of service
- Remote Cascaded

---

**Mode block act**

---

**Navigation**

 Expert → Analog outputs → Analog output 1 to n → Mode block act (1631-1 to n)

**Description**

Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→  187).

**User interface**

- Auto
- Local override
- Man
- Out of service
- Remote Cascaded

**Additional information****Description**

 A comparison of the current mode with the target mode (**Target mode** parameter (→  187)) indicates whether it was possible to reach the target mode.

---

**Mode block perm**

---

**Navigation**

 Expert → Analog outputs → Analog output 1 to n → Mode block perm (1648-1 to n)

**Description**

Displays the Mode block perm: This defines which modes of operation in the Target mode (→  187) are available for the function block. The operating modes that are supported vary depending on the type and function of the block.

**User interface**

0 to 255

---

**Mode blk norm**

---

**Navigation**

 Expert → Analog outputs → Analog output 1 to n → Mode blk norm (1643-1 to n)

**Description**

Displays the Mode blk norm: This is available to allow the operator to select the Mode blk norm from the available modes of operation. This can be set using an operating tool in order to help the user configure the operating mode of a function block.

<b>User interface</b>	<ul style="list-style-type: none"> <li>■ Auto</li> <li>■ Local override</li> <li>■ Man</li> <li>■ Out of service</li> <li>■ Remote Cascaded</li> </ul>
-----------------------	--

---

### Alarm summary

---

<b>Navigation</b>	 Expert → Analog outputs → Analog output 1 to n → Alarm summary (1642–1 to n)
<b>Description</b>	Displays the alarm summary: the current status of the block alarms is displayed. A summary of up to 16 statuses can be displayed.
<b>User interface</b>	<ul style="list-style-type: none"> <li>■ Discrete alarm</li> <li>■ Alm statHiHi lim</li> <li>■ Alrm stat Hi lim</li> <li>■ Alm statLoLo lim</li> <li>■ Alrm stat Lo lim</li> <li>■ Update Event</li> </ul>
<b>Additional information</b>	<p><i>Description</i></p> <p> Currently, the system only displays a change in a static parameter for 10 seconds, and violations of the early warning and alarm limits in the Analog Outputs function block.</p>

---

### Batch ID

---

<b>Navigation</b>	 Expert → Analog outputs → Analog output 1 to n → Batch ID (1633–1 to n)
<b>Description</b>	Use this function to enter the batch ID: identification of a specific batch to make it possible to assign device-specific information (e.g. errors, alarm conditions etc.) to the batching process.
<b>User entry</b>	Positive integer

---

### Batch operation

---

<b>Navigation</b>	 Expert → Analog outputs → Analog output 1 to n → Batch operation (1639–1 to n)
<b>Description</b>	Use this function to enter the batch operation: control recipe operation number to identify the active control recipe operation.
<b>User entry</b>	0 to 65 535
<b>Factory setting</b>	0

**Batch phase**

<b>Navigation</b>	Expert → Analog outputs → Analog output 1 to n → Batch phase (1640–1 to n)
<b>Description</b>	Use this function to enter the batch phase: control recipe phase number to identify the active control recipe operation.
<b>User entry</b>	0 to 65 535
<b>Factory setting</b>	0

**Batch Recipe**

<b>Navigation</b>	Expert → Analog outputs → Analog output 1 to n → Batch Recipe (1641–1 to n)
<b>Description</b>	Use this function to enter the batch recipe unit procedure (RUP): identification of the active control recipe unit procedure or the associated unit (e.g. inductor, centrifuge, drying agent).
<b>User entry</b>	0 to 65 535
<b>Factory setting</b>	0
<b>Additional information</b>	<b>Description</b> The unit is defined in IEC61512 Part1/ISA S88 but its meaning is different to that of the parameter unit, such as system units.

**PVscl lo range**

<b>Navigation</b>	Expert → Analog outputs → Analog output 1 to n → PVscale lo range (1651–1 to n)
<b>Description</b>	Use this function to enter the lower value range for the input value (Process Value Scale) in system units. The process value scale normalizes the input value to a user-specific range.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	0

---

**PVscale up range**

<b>Navigation</b>	Expert → Analog outputs → Analog output 1 to n → PVscale up range (1652–1 to n)
<b>Description</b>	Use this function to enter the upper value range for the input value (Process Value Scale) in system units. The process value scale normalizes the input value to a user-specific range.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	100.0

---

**Readback value**

<b>Navigation</b>	Expert → Analog outputs → Analog output 1 to n → Readback value (1659–1 to n)
<b>Description</b>	Displays the readback value. The readback value indicates the current position of the control element within the travel range (between the open and close position) in PV scale units.
<b>User interface</b>	Signed floating-point number

---

**Readback status**

<b>Navigation</b>	Expert → Analog outputs → Analog output 1 to n → Readback status (1658–1 to n)
<b>Description</b>	Displays the readback status. The readback status contains the status information of the slave.
<b>User interface</b>	0 to 255

---

**RCAS in value**

<b>Navigation</b>	Expert → Analog outputs → Analog output 1 to n → RCAS in value (1655–1 to n)
<b>Description</b>	Use this function to enter the RCAS (Remote Cascade) in value. The block set point is set by a control application via the remote cascade <b>RCAS in value</b> parameter (→ 191). The normal algorithm calculates the output value of the block on the basis of this set point.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	0

---

**RCAS in status**

<b>Navigation</b>	Expert → Analog outputs → Analog output 1 to n → RCAS in status (1654-1 to n)
<b>Description</b>	Use this function to enter the RCAS (Remote Cascade) in status. Defines the status for the RCAS in value (→  191).
<b>User entry</b>	0 to 255
<b>Factory setting</b>	0

---

**Input channel**

<b>Navigation</b>	Expert → Analog outputs → Analog output 1 to n → Input channel (1670-1 to n)
<b>Description</b>	Use this function to select the input channel. The number of logical hardware channels from the converter that is connected to this I/O block.
<b>Selection</b>	None
<b>Factory setting</b>	None

---

**Output channel**

<b>Navigation</b>	Expert → Analog outputs → Analog output 1 to n → Output channel (1671-1 to n)
<b>Description</b>	Use this function to select the output channel. The number of logical hardware channels to the converter that is connected to this I/O block.
<b>Selection</b>	<ul style="list-style-type: none"><li>■ External temp.</li><li>■ Ext. ref.density</li><li>■ External press.</li><li>■ S&amp;W</li><li>■ Water cut</li></ul>
<b>Factory setting</b>	External press.

---

**RCAS out value**

<b>Navigation</b>	Expert → Analog outputs → Analog output 1 to n → RCAS out value (1657-1 to n)
<b>Description</b>	Displays the RCAS out value. Displays the set point of the block which is made available to the higher-level host for monitoring/back calculation and which makes it possible to take action under certain conditions or in a different mode.

---

User interface	Signed floating-point number
----------------	------------------------------

---

### RCAS out status

---

Navigation	 Expert → Analog outputs → Analog output 1 to n → RCAS out status (1656–1 to n)
Description	Displays the RCAS out status. Displays the status of the set point.
User interface	0 to 0xFF

---

### Pos value

---

Navigation	 Expert → Analog outputs → Analog output 1 to n → Pos value (1650–1 to n)
Description	Displays the current value of the positioner.
User interface	0 to 255

---

### Position status

---

Navigation	 Expert → Analog outputs → Analog output 1 to n → Position status (1649–1 to n)
Description	Displays the current status of the positioner.
User interface	0 to 255

---

### Setp. deviation

---

Navigation	 Expert → Analog outputs → Analog output 1 to n → Setp. deviation (1653–1 to n)
Description	Displays the deviation between the set point ( <b>Set point val</b> parameter (→  184)) and the actual value ( <b>Readback value</b> parameter (→  191)).
User interface	Signed floating-point number

---

### Simulate enabled

---

Navigation	 Expert → Analog outputs → Analog output 1 to n → Simulate enabled (1662–1 to n)
Description	Use this function to enable or disable block simulation.

<b>Selection</b>	<ul style="list-style-type: none"><li>■ Disable</li><li>■ Enable</li></ul>
<b>Factory setting</b>	Disable
<b>Additional information</b>	<i>Description</i> The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated discrete I/O channel during operation.

---

**Simulate value** █

<b>Navigation</b>	 Expert → Analog outputs → Analog output 1 to n → Simulate value (1664–1 to n)
<b>Description</b>	Use this function to enter a simulation value.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	0
<b>Additional information</b>	<i>Description</i> The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated value during operation.

---

**Simulate status** █

<b>Navigation</b>	 Expert → Analog outputs → Analog output 1 to n → Simulate status (1663–1 to n)
<b>Description</b>	Use this function to enter a simulation status for the block.
<b>User entry</b>	0 to 255
<b>Factory setting</b>	0
<b>Additional information</b>	<i>Description</i> The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated status during operation.

---

**Increase close** █

<b>Navigation</b>	 Expert → Analog outputs → Analog output 1 to n → Increase close (1638–1 to n)
<b>Description</b>	Use this function to enter the effective direction of the positioner in automatic mode.
<b>User entry</b>	0 to 255

**Factory setting** 0

**Out scale up**

<b>Navigation</b>	Expert → Analog outputs → Analog output 1 to n → Out scale up (1646–1 to n)
<b>Description</b>	Use this function to enter the upper value range for the output value in system units.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	100.0

**Out scale low**

<b>Navigation</b>	Expert → Analog outputs → Analog output 1 to n → Out scale low (1644–1 to n)
<b>Description</b>	Use this function to enter the lower value range for the output value in system units.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	0

### 3.10 "Discrete outputs" submenu

*Navigation* Expert → Discrete outputs

► Discrete outputs

► Discr. out. 1 to n

→ 195

#### 3.10.1 "Discrete output 1 to n" submenu

*Navigation* Expert → Discrete outputs → Discr. out. 1 to n

► Discr. out. 1 to n

Set point val (1715–1 to n)

→ 196

Set point status (1714–1 to n)

→ 196

Invert (1692–1 to n)

→ 196

Fail safe time (1697–1 to n)	→  197
Fail safe type (1696–1 to n)	→  197
Fail-safe value (1693–1 to n)	→  198
Out value (1704–1 to n)	→  198
Out status (1723–1 to n)	→  198
Out status (1703–1 to n)	→  198

**Set point val**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Set point val (1715–1 to n)

**Description** Use this function to enter an analog set point.

**User entry** 0 to 255

**Factory setting** 0

**Set point status**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Set point status (1714–1 to n)

**Description** Use this function to enter a status for the analog set point.

**User entry** 0 to 255

**Factory setting** 0

**Invert**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Invert (1692–1 to n)

**Description** Use this function to switch inversion on and off. Specifies whether the set point should be inverted before the value is set as the output value or the RCAS value (in the automatic mode).

**Selection**

- Off
- On

**Factory setting** Off

---

**Fail safe time**

<b>Navigation</b>	Expert → Discrete outputs → Discr. out. 1 to n → Fail safe time (1697–1 to n)
<b>Description</b>	Use this function to enter a time span within which the criteria for an error must be met continuously before an error message or notice message is generated.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	0
<b>Additional information</b>	<i>User entry</i> <b>NOTE!</b> <b>If this parameter is used, error messages and notice messages are delayed by the set time before being relayed to the higher-level controller (DCS, etc.).</b> <ul style="list-style-type: none"><li>▶ Check in advance to ensure that the safety-specific requirements of the process would permit this.</li><li>▶ If the error and notice messages may not be suppressed, a value of 0 seconds must be configured here.</li></ul>

---

**Fail safe type**

<b>Navigation</b>	Expert → Discrete outputs → Discr. out. 1 to n → Fail safe type (1696–1 to n)
<b>Description</b>	Use this function to select the failure mode.
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Fail-safe value</li><li>■ Fallback value</li><li>■ Off</li></ul>
<b>Factory setting</b>	Fallback value
<b>Additional information</b>	<i>Selection</i> If an input or simulation value has the status BAD, the function block uses this predefined failure value: <ul style="list-style-type: none"><li>■ Fail-safe value A substitute value is used. This is specified in the <b>Fail-safe value</b> parameter (→ <a href="#">198</a>).</li><li>■ Fallback value If the value was good at one point, then this last valid value is used.</li><li>■ Off The system continues to use the bad value.</li></ul>

---

**Fail-safe value**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Fail-safe value (1693–1 to n)

**Prerequisite** In **Fail safe type** parameter (→ 197), the **Fail-safe value** option is selected.

**Description** Use this function to enter a failure value. The value entered is displayed as the output value (**Out value** parameter (→ 198)) in the event of an error.

**User entry** 0 to 255

**Factory setting** 0

---

**Out value**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Out value (1704–1 to n)

**Prerequisite** In **Target mode** parameter (→ 200), the **Auto** option is selected.

**Description** Displays the analog value which is calculated when the function is executed.

**User interface** 0 to 255

---

**Out status**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Out status (1723–1 to n)

**Description** Displays the current output status (Good, Bad, Uncertain).

**User interface**

- Good
- Uncertain
- Bad

---

**Out status**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Out status (1703–1 to n)

**Prerequisite** In **Target mode** parameter (→ 200), the **Auto** option is selected.

**Description** Displays the current output status (hex value).

**User interface** 0 to 0xFF

---

**Tag description**

<b>Navigation</b>	Expert → Discrete outputs → Discr. out. 1 to n → Tag description (1721–1 to n)
<b>Description</b>	Use this function to enter a string to identify the block.
<b>User entry</b>	Max. 32 characters such as letters, numbers or special characters (e.g. @, %, /).

---

**Static revision**

<b>Navigation</b>	Expert → Discrete outputs → Discr. out. 1 to n → Static revision (1720–1 to n)
<b>Description</b>	Displays the event counter: every write access to a static block parameter is counted.
<b>User interface</b>	0 to FFFF
<b>Additional information</b>	<i>Description</i>
	Static parameters are parameters that are not changed by the process.

---

**Strategy**

<b>Navigation</b>	Expert → Discrete outputs → Discr. out. 1 to n → Strategy (1719–1 to n)
<b>Description</b>	Use this function to enter the strategy: makes it possible to group blocks by entering identical numbers.
<b>User entry</b>	0 to FFFF
<b>Factory setting</b>	0

---

**Alert key**

<b>Navigation</b>	Expert → Discrete outputs → Discr. out. 1 to n → Alert key (1694–1 to n)
<b>Description</b>	Use this function to enter the alert key: identifies the section of the plant where the transmitter is located. This helps in pinpointing events.
<b>User entry</b>	0 to 0xFF
<b>Factory setting</b>	0

## Target mode



**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Target mode (1722-1 to n)

**Description** Displays the Target mode: The target mode specifies which mode of operation is used for this function block. This mode is generally set by a control application.

**User interface**

- Local override
- Remote Cascaded
- Man
- Out of service
- Auto

## Mode block act

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Mode block act (1691-1 to n)

**Description** Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→ 200).

**User interface**

- Local override
- Remote Cascaded
- Man
- Out of service
- Auto

**Additional information**

*Description*

A comparison of the current mode with the target mode (**Target mode** parameter (→ 200)) indicates whether it was possible to reach the target mode.

## Mode block perm

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Mode block perm (1705-1 to n)

**Description** Displays the Mode block perm: This defines which modes of operation in the Target mode (→ 200) are available for the function block. The operating modes that are supported vary depending on the type and function of the block.

**User interface**

0 to 255

---

**Mode blk norm**

---

<b>Navigation</b>	 Expert → Discrete outputs → Discr. out. 1 to n → Mode blk norm (1702–1 to n)
<b>Description</b>	Displays the Mode blk norm: This is available to allow the operator to select the Mode blk norm from the available modes of operation. This can be set using an operating tool in order to help the user configure the operating mode of a function block.
<b>User interface</b>	<ul style="list-style-type: none"> <li>■ Local override</li> <li>■ Remote Cascaded</li> <li>■ Man</li> <li>■ Out of service</li> <li>■ Auto</li> </ul>

---

**Alarm summary**

---

<b>Navigation</b>	 Expert → Discrete outputs → Discr. out. 1 to n → Alarm summary (1701–1 to n)
<b>Description</b>	Displays the alarm summary: the current status of the block alarms is displayed. A summary of up to 16 statuses can be displayed.
<b>User interface</b>	<ul style="list-style-type: none"> <li>■ Discrete alarm</li> <li>■ Alm statHiHi lim</li> <li>■ Alrm stat Hi lim</li> <li>■ Alm statLoLo lim</li> <li>■ Alrm stat Lo lim</li> <li>■ Update Event</li> </ul>
<b>Additional information</b>	<p><i>Description</i></p> <p> Currently, the system only displays a change in a static parameter for 10 seconds, and violations of the early warning and alarm limits in the Discrete Outputs function block.</p>

---

**Batch ID**

---



<b>Navigation</b>	 Expert → Discrete outputs → Discr. out. 1 to n → Batch ID (1695–1 to n)
<b>Description</b>	Use this function to enter the batch ID: identification of a specific batch to make it possible to assign device-specific information (e.g. errors, alarm conditions etc.) to the batching process.
<b>User entry</b>	Positive integer

**Batch operation**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Batch operation (1698–1 to n)

**Description** Use this function to enter the batch operation: control recipe operation number to identify the active control recipe operation.

**User entry** 0 to 65 535

**Factory setting** 0

**Batch phase**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Batch phase (1699–1 to n)

**Description** Use this function to enter the batch phase: control recipe phase number to identify the active control recipe operation.

**User entry** 0 to 65 535

**Factory setting** 0

**Batch Recipe**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Batch Recipe (1700–1 to n)

**Description** Use this function to enter the batch recipe unit procedure (RUP): identification of the active control recipe unit procedure or the associated unit (e.g. inductor, centrifuge, drying agent).

**User entry** 0 to 65 535

**Factory setting** 0

**Additional information** *Description*



The unit is defined in IEC61512 Part1/ISA S88 but its meaning is different to that of the parameter unit, such as system units.

**Readback value**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Readback value (1713–1 to n)

**Description** Displays the readback value. The readback value indicates the current position of the control element and the element's sensors.

---

<b>User interface</b>	0 to 255
-----------------------	----------

---

**Readback status**

<b>Navigation</b>	 Expert → Discrete outputs → Discr. out. 1 to n → Readback status (1712–1 to n)
<b>Description</b>	Displays the readback status. Displays the status of the readback value.
<b>User interface</b>	0 to 255

---

**RCAS in value**

<b>Navigation</b>	 Expert → Discrete outputs → Discr. out. 1 to n → RCAS in value (1707–1 to n)
<b>Description</b>	Use this function to enter the RCAS (Remote Cascade) in value. The block set point is set by a control application via the remote cascade <b>RCAS in value</b> parameter (→  203). The normal algorithm calculates the output value of the block on the basis of this set point.
<b>User entry</b>	0 to 255
<b>Factory setting</b>	0

---

**RCAS in status**

<b>Navigation</b>	 Expert → Discrete outputs → Discr. out. 1 to n → RCAS in status (1706–1 to n)
<b>Description</b>	Use this function to enter the RCAS (Remote Cascade) in status. Defines the status for the RCAS in value (→  203).
<b>User entry</b>	0 to 255
<b>Factory setting</b>	0

---

**Input channel**

<b>Navigation</b>	 Expert → Discrete outputs → Discr. out. 1 to n → Input channel (1724–1 to n)
<b>Description</b>	Use this function to select the input channel. The number of logical hardware channels from the converter that is connected to this I/O block.
<b>Selection</b>	None
<b>Factory setting</b>	None

**Output channel**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Output channel (1725–1 to n)

**Description** Use this function to select the output channel. The number of logical hardware channels to the converter that is connected to this I/O block.

**Selection**

- Start verificat.\*
- Zero point adj.
- Flow override
- I/O module 2
- I/O module 3
- I/O module 4
- Liqu. type conc.

**Factory setting** Flow override

---

**RCAS out value**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → RCAS out value (1711–1 to n)

**Description** Displays the RCAS out value. Displays the set point of the block which is made available to the higher-level host for monitoring/back calculation and which makes it possible to take action under certain conditions or in a different mode.

**User interface** 0 to 255

---

**RCAS out status**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → RCAS out status (1708–1 to n)

**Description** Displays the RCAS out status. Displays the status of the set point.

**User interface** 0 to 255

---

**Simulate enabled**

**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Simulate enabled (1716–1 to n)

**Description** Use this function to enable or disable block simulation.

**Selection**

- Disable
- Enable

---

\* Visibility depends on order options or device settings

**Factory setting** Disable

**Additional information** *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated discrete I/O channel during operation.

---

## Simulate value



**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Simulate value (1718-1 to n)

**Description** Use this function to enter a simulation value.

**User entry** 0 to 255

**Factory setting** 0

**Additional information** *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated value during operation.

---

## Simulate status



**Navigation** Expert → Discrete outputs → Discr. out. 1 to n → Simulate status (1717-1 to n)

**Description** Use this function to enter a simulation status for the block.

**User entry** 0 to 255

**Factory setting** 0

**Additional information** *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated status during operation.

## 3.11 "Application" submenu

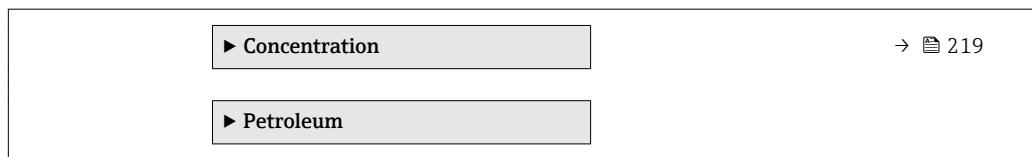
*Navigation*

Expert → Application

**► Application**

**► Totalizer 1 to n**

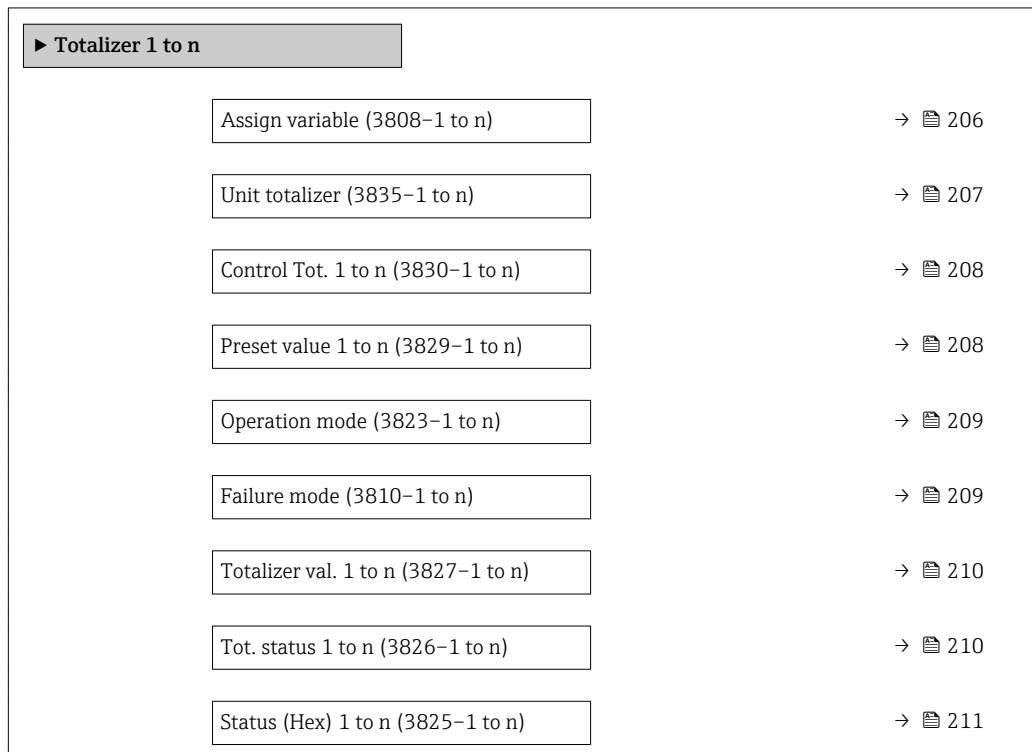
→ 206



### 3.11.1 "Totalizer 1 to n" submenu

Navigation

Expert → Application → Totalizer 1 to n



## Assign variable



Navigation

Expert → Application → Totalizer 1 to n → Assign variable (3808-1 to n)

Description

Use this function to select a process variable for the Totalizer 1 to n.

Selection

- Mass flow
- Volume flow
- Correct.vol.flow \*
- Target mass flow \*
- Carrier mass fl. \*
- Target vol. flow \*
- Carrier vol. fl. \*
- Targ.corr.vol.fl \*
- Carr.corr.vol.fl \*

Factory setting

Mass flow

\* Visibility depends on order options or device settings

**Additional information***Description*

If the option selected is changed, the device resets the totalizer to 0.

**Unit totalizer****Navigation**

Expert → Application → Totalizer 1 to n → Unit totalizer (3835-1 to n)

**Description**

Use this function to select the process variable of a totalizer.

The unit is selected separately for each totalizer. It is independent of the selection made in the **System units** submenu (→ 58).

**Selection***SI units*

- g \*
- kg \*
- t

*US units*

- oz \*
- lb \*
- STon \*

\* Visibility depends on order options or device settings

or

*SI units*

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

*US units*

- af \*
- ft<sup>3</sup> \*
- fl oz (us) \*
- gal (us) \*
- kgal (us) \*
- Mgal (us) \*
- bbl (us;oil) \*
- bbl (us;tank) \*

*Imperial units*

- gal (imp) \*
- Mgal (imp) \*
- bbl (imp;oil) \*

\* Visibility depends on order options or device settings

or

*US units*

- bbl (us;liq.) \*
- bbl (us;beer) \*

*Imperial units*

- bbl (imp;beer) \*

\* Visibility depends on order options or device settings

or

*SI units*

- Nl \*
- Nm<sup>3</sup> \*
- Sl \*
- Sm<sup>3</sup> \*

*US units*

- Sft<sup>3</sup> \*
- Sgal (us) \*
- Sbbl (us;liq.) \*

*Imperial units*

- Sgal (imp) \*

\* Visibility depends on order options or device settings

---

<b>Factory setting</b>	Country-specific: <ul style="list-style-type: none"><li>▪ kg</li><li>▪ lb</li></ul>
<b>Additional information</b>	<p><i>Selection</i></p> <p>The selection is independent of the process variable selected in the <b>Assign variable</b> parameter (→ 206).</p> <p><i>Dependency</i></p> <p>The following parameters depend on the option selected:</p> <ul style="list-style-type: none"><li>▪ <b>Alarm hysteresis</b> parameter (→ 215)</li><li>▪ <b>Hi Hi Lim</b> parameter (→ 215)</li><li>▪ <b>Hi Lim</b> parameter (→ 216)</li><li>▪ <b>Lo Lim</b> parameter (→ 216)</li><li>▪ <b>Lo Lo Lim</b> parameter (→ 217)</li><li>▪ <b>Totalizer val.</b> parameter (→ 52)</li><li>▪ <b>Preset value</b> parameter (→ 208)</li></ul>

---

## Control Tot. 1 to n

---

<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Control Tot. 1 to n (3830–1 to n)
<b>Description</b>	Use this function to select the control of totalizer value 1-3.
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Totalize</li><li>▪ Reset + hold</li><li>▪ Preset + hold</li></ul>
<b>Factory setting</b>	Totalize
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"><li>▪ Totalize The totalizer is started or continues totalizing with the current counter reading.</li><li>▪ Reset + hold The totaling process is stopped and the totalizer is reset to 0.</li><li>▪ Preset + hold The totaling process is stopped and the totalizer is set to its defined start value from the <b>Preset value</b> parameter.</li></ul>

---

## Preset value 1 to n

---

<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Preset value 1 to n (3829–1 to n)
<b>Description</b>	Use this function to enter an initial value for the specific totalizer.
<b>User entry</b>	Signed floating-point number

<b>Factory setting</b>	Country-specific: ■ kg ■ lb
<b>Additional information</b>	<i>User entry</i>  The unit of the selected process variable is specified for the totalizer in the <b>Unit totalizer</b> parameter (→ 207).

*Example*

This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.

---

**Operation mode**

<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Operation mode (3823-1 to n)
-------------------	--

<b>Description</b>	Use this function to select how the totalizer summates the flow.
--------------------	--

<b>Selection</b>	■ Net flow total ■ Forward total ■ Reverse total ■ Last valid value
------------------	--

<b>Factory setting</b>	Net flow total
------------------------	----------------

<b>Additional information</b>	<i>Selection</i> ■ Net flow total Positive and negative flow values 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 against the forward flow direction is totalized (= reverse flow total). ■ Last valid value The value is frozen. Totaling is stopped.
-------------------------------	--

---

**Failure mode**

<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Failure mode (3810-1 to n)
-------------------	--

<b>Description</b>	Use this function to select how a totalizer behaves in the event of a device alarm.
--------------------	---

<b>Selection</b>	■ Stop ■ Actual value ■ Last valid value
------------------	--

<b>Factory setting</b>	Actual value
------------------------	--------------

**Additional information***Description*

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

*Selection*

- Stop

Totalizing is stopped when a device alarm occurs.

- Actual value

The totalizer continues to count based on the current measured value; the device alarm is ignored.

- Last valid value

The totalizer continues to count based on the last valid measured value before the device alarm occurred.

---

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

Expert → Application → Totalizer 1 to n → Totalizer val. 1 to n (3827–1 to n)

**Prerequisite**

In the **Target mode** parameter (→ 212), the **Auto** option is selected.

**Description**

Displays the current reading for totalizer 1-3.

**User interface**

Signed floating-point number

**Additional information***Description*

In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→ 209).

*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 (→ 209).

*Dependency*

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 207).

---

**Tot. status 1 to n****Navigation**

Expert → Application → Totalizer 1 to n → Tot. status 1 to n (3826–1 to n)

**Description**

Displays the status of the particular totalizer.

**User interface**

- Good
- Uncertain
- Bad

---

**Status (Hex) 1 to n**

---

<b>Navigation</b>	  Expert → Application → Totalizer 1 to n → Status (Hex) 1 to n (3825–1 to n)
<b>Prerequisite</b>	In <b>Target mode</b> parameter (→ 212), the <b>Auto</b> option is selected.
<b>Description</b>	Displays the status value (hex) of the particular totalizer.
<b>User interface</b>	0 to 0xFF

---

**Tag description**

---



<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Tag description (3833–1 to n)
<b>Description</b>	Use this function to enter a string to identify the block.
<b>User entry</b>	Max. 32 characters such as letters, numbers or special characters (e.g. @, %, /).

---

**Static revision**

---

<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Static revision (3832–1 to n)
<b>Description</b>	Displays the event counter: every write access to a static block parameter is counted.
<b>User interface</b>	0 to FFFF
<b>Additional information</b>	<i>Description</i>
	 Static parameters are parameters that are not changed by the process.

---

**Strategy**

---



<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Strategy (3831–1 to n)
<b>Description</b>	Use this function to enter the strategy: makes it possible to group blocks by entering identical numbers.
<b>User entry</b>	0 to FFFF
<b>Factory setting</b>	0

**Alert key****Navigation**

█ Expert → Application → Totalizer 1 to n → Alert key (3803-1 to n)

**Description**

Use this function to enter the alert key: identifies the section of the plant where the transmitter is located. This helps in pinpointing events.

**User entry**

0 to 0xFF

**Factory setting**

0

**Target mode****Navigation**

█ Expert → Application → Totalizer 1 to n → Target mode (3834-1 to n)

**Description**

Displays the Target mode: The target mode indicates which mode of operation is used for this function block. This mode is generally set by a control application.

**User interface**

- Auto
- Man
- Out of service

**Mode block act****Navigation**

█ Expert → Application → Totalizer 1 to n → Mode block act (3801-1 to n)

**Description**

Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→ 212).

**User interface**

- Auto
- Man
- Out of service

**Additional information****Description**

A comparison of the current mode with the target mode (**Target mode** parameter (→ 212)) indicates whether it was possible to reach the target mode.

---

## Mode block perm

---

<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Mode block perm (3828-1 to n)
<b>Description</b>	Displays the Mode block perm: This defines which modes of operation in the Target mode (→ <a href="#">212</a> ) are available for the function block. The operating modes that are supported vary depending on the type and function of the block.
<b>User interface</b>	0 to 255

---

## Mode blk norm

---

<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Mode blk norm (3824-1 to n)
<b>Description</b>	Displays the Mode blk norm: This is available to allow the operator to select the Mode blk norm from the available modes of operation. This can be set using an operating tool in order to help the user configure the operating mode of a function block.
<b>User interface</b>	<ul style="list-style-type: none"><li>■ Auto</li><li>■ Man</li><li>■ Out of service</li></ul>

---

## Alarm summary

---

<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Alarm summary (3809-1 to n)
<b>Description</b>	Displays the alarm summary: the current status of the block alarms is displayed. A summary of up to 16 statuses can be displayed.
<b>User interface</b>	<ul style="list-style-type: none"><li>■ Discrete alarm</li><li>■ Alm statHiHi lim</li><li>■ Alrm stat Hi lim</li><li>■ Alm statLoLo lim</li><li>■ Alrm stat Lo lim</li><li>■ Update Event</li></ul>
<b>Additional information</b>	<p><i>Description</i></p> <p> Currently, the system only displays a change in a static parameter for 10 seconds, and violations of the early warning and alarm limits in the Totalizer function block.</p>

**Batch ID****Navigation**

█ Expert → Application → Totalizer 1 to n → Batch ID (3804–1 to n)

**Description**

Use this function to enter the batch ID: identification of a specific batch to make it possible to assign device-specific information (e.g. errors, alarm conditions etc.) to the batching process.

**User entry**

Positive integer

**Factory setting**

0

**Batch operation****Navigation**

█ Expert → Application → Totalizer 1 to n → Batch operation (3805–1 to n)

**Description**

Use this function to enter the batch operation: control recipe operation number to identify the active control recipe operation.

**User entry**

0 to 65 535

**Factory setting**

0

**Batch phase****Navigation**

█ Expert → Application → Totalizer 1 to n → Batch phase (3806–1 to n)

**Description**

Use this function to enter the batch phase: control recipe phase number to identify the active control recipe operation.

**User entry**

0 to 65 535

**Factory setting**

0

**Batch Recipe****Navigation**

█ Expert → Application → Totalizer 1 to n → Batch Recipe (3807–1 to n)

**Description**

Use this function to enter the batch recipe unit procedure (RUP): identification of the active control recipe unit procedure or the associated unit (e.g. inductor, centrifuge, drying agent).

**User entry**

0 to 65 535

**Factory setting**

0

**Additional information**      *Description*

 The unit is defined in IEC61512 Part1/ISA S88 but its meaning is different to that of the parameter unit, such as system units.

**Alarm hysteresis**

**Navigation**       Expert → Application → Totalizer 1 to n → Alarm hysteresis (3802–1 to n)

**Description**      Use this function to enter the hysteresis value for the upper and lower warning or alarm limit values.

**User entry**      Signed floating-point number

**Factory setting**      0 kg

**Additional information**      *User entry*

 The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ [207](#)).

**Hi Hi Lim**

**Navigation**       Expert → Application → Totalizer 1 to n → Hi Hi Lim (3815–1 to n)

**Description**      Use this function to enter the value for the upper alarm limit of the totalizer (**HiHi alarm value** parameter (→ [217](#))).

**User entry**      Signed floating-point number

**Factory setting**      Positive floating-point number

**Additional information**      *Description*

 If the output value Out value (→ [165](#)) exceeds this limit value, the **HiHi alarm state** parameter (→ [217](#)) is output.

*User entry*

 The value is entered in the defined units (**Out unit** parameter (→ [170](#))) and must be in the range defined in the **Out scale low** parameter (→ [169](#)) and **Out scale up** parameter (→ [170](#)).

 The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ [207](#)).

**Hi Lim****Navigation**

Expert → Application → Totalizer 1 to n → Hi Lim (3816–1 to n)

**Description**

Use this function to enter the value for the upper warning limit of the totalizer (**Hi alarm value** parameter (→ 218)).

**User entry**

Signed floating-point number

**Factory setting**

Positive floating-point number

**Additional information***Description*

**i** If the output value Out value (→ 165) exceeds this limit value, the **Hi alarm state** parameter (→ 218) is output.

*User entry*

**i** The value is entered in the defined units (**Out unit** parameter (→ 170)) and must be in the range defined in the **Out scale low** parameter (→ 169) and **Out scale up** parameter (→ 170).

**i** The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 207).

**Lo Lim****Navigation**

Expert → Application → Totalizer 1 to n → Lo Lim (3819–1 to n)

**Description**

Use this function to enter the value for the lower warning limit of the totalizer (**Lo alarm value** parameter (→ 218)).

**User entry**

Signed floating-point number

**Factory setting**

Negative floating-point number

**Additional information***Description*

**i** If the output value Out value (→ 165) exceeds this limit value, the **Lo alarm state** parameter (→ 218) is output.

*User entry*

**i** The value is entered in the defined units (**Out unit** parameter (→ 170)) and must be in the range defined in the **Out scale low** parameter (→ 169) and **Out scale up** parameter (→ 170).

**i** The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 207).

**Lo Lo Lim**

**Navigation** Expert → Application → Totalizer 1 to n → Lo Lo Lim (3822–1 to n)

**Description** Use this function to enter the value for the lower alarm limit of the totalizer (**LoLo alarm value** parameter (→ [219\)\).](#)

**User entry** Signed floating-point number

**Factory setting** Negative floating-point number

**Additional information** *Description*

If the output value Out value (→ [165\) exceeds this limit value, the \*\*LoLo alarm state\*\* parameter \(→ \[219\\) is output.\]\(#\)](#)

*User entry*

The value is entered in the defined units (**Out unit** parameter (→ [170\)\) and must be in the range defined in the \*\*Out scale low\*\* parameter \(→ \[169\\) and \\*\\*Out scale up\\*\\* parameter \\(→ \\[170\\\).\\]\\(#\\)\]\(#\)](#)

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ [207\).](#)

**HiHi alarm value**

**Navigation** Expert → Application → Totalizer 1 to n → HiHi alarm value (3814–1 to n)

**Description** Displays the alarm value for the upper alarm limit value (**Hi Hi Lim** parameter (→ [215\)\).](#)

**User interface** Signed floating-point number

**HiHi alarm state**

**Navigation** Expert → Application → Totalizer 1 to n → HiHi alarm state (3813–1 to n)

**Description** Displays the status for the upper alarm limit value (**Hi Hi Lim** parameter (→ [215\)\).](#)

**User interface**

- No alarm
- Alm statHiHi lim

**Additional information** *User interface*

The display contains information such as the time of the alarm (date and time) and the value that triggered the alarm.

---

**Hi alarm value**

---

<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Hi alarm value (3812–1 to n)
<b>Description</b>	Displays the warning value for the upper warning limit value ( <b>Hi Lim</b> parameter (→ <a href="#">216</a> )).
<b>User interface</b>	Signed floating-point number

---

**Hi alarm state**

---

<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Hi alarm state (3811–1 to n)
<b>Description</b>	Displays the status for the upper warning limit value ( <b>Hi Lim</b> parameter (→ <a href="#">216</a> )).
<b>User interface</b>	<ul style="list-style-type: none"><li>■ No warning</li><li>■ Alrm stat Hi lim</li></ul>
<b>Additional information</b>	<i>User interface</i>
	 The display contains information such as the time of the warning (date and time) and the value that triggered the alarm.

---

**Lo alarm value**

---

<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Lo alarm value (3818–1 to n)
<b>Description</b>	Displays the warning value for the lower warning limit value ( <b>Lo Lim</b> parameter (→ <a href="#">216</a> )).
<b>User interface</b>	Signed floating-point number

---

**Lo alarm state**

---

<b>Navigation</b>	 Expert → Application → Totalizer 1 to n → Lo alarm state (3817–1 to n)
<b>Description</b>	Displays the status for the lower warning limit value ( <b>Lo Lim</b> parameter (→ <a href="#">216</a> )).
<b>User interface</b>	<ul style="list-style-type: none"><li>■ No warning</li><li>■ Alrm stat Lo lim</li></ul>
<b>Additional information</b>	<i>User interface</i>
	 The display contains information such as the time of the warning (date and time) and the value that triggered the alarm.

**LoLo alarm value**

**Navigation**  Expert → Application → Totalizer 1 to n → LoLo alarm value (3821–1 to n)

**Description** Displays the alarm value for the lower alarm limit value (**Lo Lo Lim** parameter (→ [217](#))).

**User interface** Signed floating-point number

**LoLo alarm state**

**Navigation**  Expert → Application → Totalizer 1 to n → LoLo alarm state (3820–1 to n)

**Description** Displays the status for the lower alarm limit value (**Lo Lo Lim** parameter (→ [217](#))).

**User interface**

- No alarm
- Alm statLoLo lim

**Additional information** *User interface*

 The display contains information such as the time of the alarm (date and time) and the value that triggered the alarm.

**3.11.2 "Concentration" submenu**

 For detailed information on the parameter descriptions for the **Concentration** application package, refer to the Special Documentation for the device → [7](#)

*Navigation*

 Expert → Application → Concentration

► Concentration

**3.12 "Diagnostics" submenu**

*Navigation*

 Expert → Diagnostics

► Diagnostics

Actual diagnos. (0691)

→ [220](#)

Prev.diagnostics (0690)

→ [221](#)

Time fr. restart (0653)

→ [222](#)

Operating time (0652)

→ [222](#)

► Diagnostic list	→  222
► Event logbook	→  227
► Device info	→  229
► Main elec.+I/O1	→  232
► Sens. electronic	→  233
► I/O module 1	→  234
► I/O module 2	→  235
► Display module	→  236
► Min/max val.	→  237
► Data logging	→  244
► Heartbeat	→  253
► Simulation	→  254

---

## 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 (→ 222).

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 current diagnostic 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>Actual diagnos.</b> parameter (→  220).
	<i>Example</i>
	For the display format: 24d12h13m00s

---

**Prev.diagnostics**

---

<b>Navigation</b>	  Expert → Diagnostics → Prev.diagnostics (0690)
<b>Prerequisite</b>	Two diagnostic events have already occurred.
<b>Description</b>	Displays the diagnostic message that occurred before the current message.
<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>Example</i>
	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)

**Additional information***Display*

The diagnostic message can be viewed via the **Prev.diagnostics** parameter  
(→ [221](#)).

*Example*

For the display format:

24d12h13m00s

---

**Time fr. restart**

---

**Navigation**

Expert → Diagnostics → Time fr. restart (0653)

**Description**

Use this function to display the time the device has been in operation since the last device restart.

**User interface**

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

---

**Operating time**

---

**Navigation**

Expert → Diagnostics → 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.

### 3.12.1 "Diagnostic list" submenu

**Navigation**

Expert → Diagnostics → Diagnostic list

► Diagnostic list

Diagnostics 1 (0692)

→ [223](#)

Diagnostics 2 (0693)

→ [223](#)

Diagnostics 3 (0694)

→ [224](#)

Diagnostics 4 (0695)

→ [225](#)

Diagnostics 5 (0696)

→ [226](#)

---

## Diagnostics 1

---

<b>Navigation</b>	  Expert → Diagnostics → Diagnostic list → Diagnostics 1 (0692)
<b>Description</b>	Displays the current diagnostics message with the 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 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 1</b> parameter (→  223).
	<i>Example</i> For the display format: 24d12h13m00s

---

## Diagnostics 2

---

<b>Navigation</b>	  Expert → Diagnostics → Diagnostic list → Diagnostics 2 (0693)
<b>Description</b>	Displays the current diagnostics message with the second-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 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 (→  223).

*Example*

For the display format:

24d12h13m00s

---

**Diagnostics 3**

---

**Navigation**

  Expert → Diagnostics → Diagnostic list → Diagnostics 3 (0694)

**Description**

Displays the current diagnostics message with the third-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 third-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 3** parameter (→  224).

*Example*

For the display format:  
24d12h13m00s

---

**Diagnostics 4**

---

**Navigation**

  Expert → Diagnostics → Diagnostic list → Diagnostics 4 (0695)

**Description**

Displays the current diagnostics message with the fourth-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 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 (→ 225).

*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*

The diagnostic message can be viewed via the **Diagnostics 5** parameter (→ 226).

*Example*

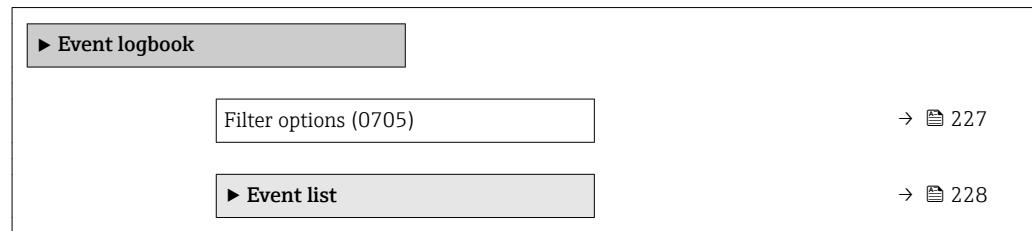
For the display format:  
24d12h13m00s

### 3.12.2 "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*

- i** 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

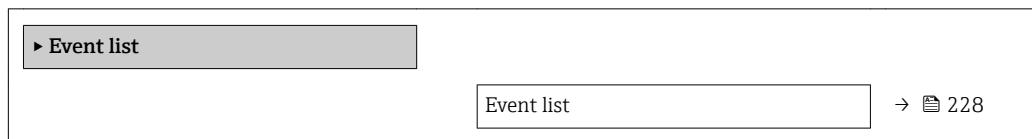
#### "Event list" submenu

**i** 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 (→  227).

**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.

### 3.12.3 "Device info" submenu

#### *Navigation*

Expert → Diagnostics → Device info

► Device info	
Device tag (0011)	→ 229
Serial number (0009)	→ 230
Firmware version (0010)	→ 230
Device name (0020)	→ 231
Order code (0008)	→ 231
Ext. order cd. 1 (0023)	→ 231
Ext. order cd. 2 (0021)	→ 232
Ext. order cd. 3 (0022)	→ 232
ENP version (0012)	→ 232

---

#### Device tag

---

#### *Navigation*

Expert → Diagnostics → Device info → Device tag (0011)

#### *Description*

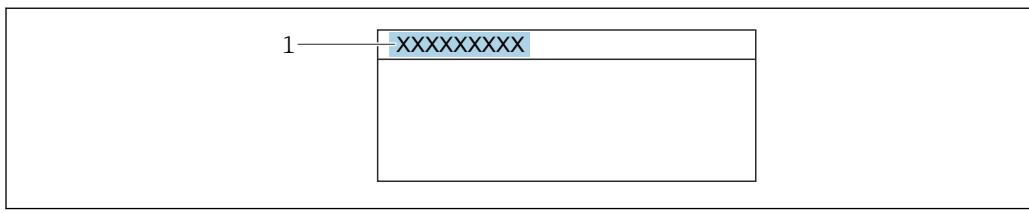
Displays a unique name for the measuring point so it can be identified quickly within the plant. The name is displayed in the header.

#### *User interface*

Max. 32 characters, such as letters, numbers or special characters (e.g. @, %, /).

**Factory setting** Cubemass 500 PA

**Additional information** *Display*



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** Cubemass 300/500

**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**

<b>Navigation</b>	Expert → Diagnostics → Device info → Ext. order cd. 2 (0021)
<b>Description</b>	Displays the second part of the extended order code.
<b>User interface</b>	Character string
<b>Additional information</b>	For additional information, see <b>Ext. order cd. 1</b> parameter (→  231)

**Ext. order cd. 3**

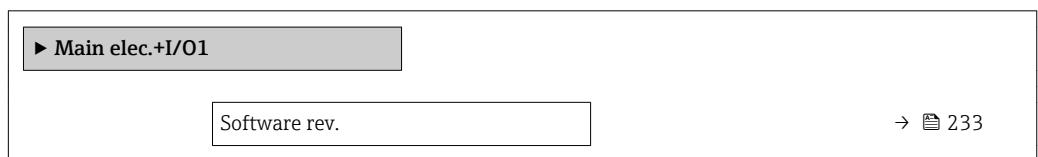
<b>Navigation</b>	Expert → Diagnostics → Device info → Ext. order cd. 3 (0022)
<b>Description</b>	Displays the third part of the extended order code.
<b>User interface</b>	Character string
<b>Additional information</b>	For additional information, see <b>Ext. order cd. 1</b> parameter (→  231)

**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.

**3.12.4 "Main elec.+I/O1" submenu**

*Navigation*      Expert → Diagnostics → Main elec.+I/O1



Build no. softw.	→  233
Bootloader rev.	→  233

---

**Software rev.**

---

**Navigation** Expert → Diagnostics → Main elec.+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 → Main elec.+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 → Main elec.+I/O1 → Bootloader rev. (0073)

**Description** Use this function to display the bootloader revision of the software.

**User interface** Positive integer

### 3.12.5 "Sens. electronic" submenu

*Navigation* Expert → Diagnostics → Sens. electronic

<b>Sens. electronic</b>	
Software rev. (0072)	→  234
Build no. softw. (0079)	→  234
Bootloader rev. (0073)	→  234

---

**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.**

---

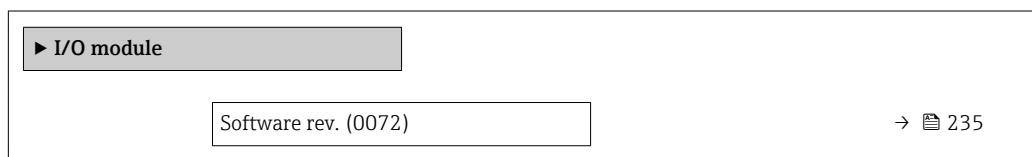
**Navigation**        Expert → Diagnostics → Sens. electronic → Bootloader rev. (0073)

**Description**      Use this function to display the bootloader revision of the software.

**User interface**      Positive integer

### 3.12.6 "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)

---

**Software rev.**

---

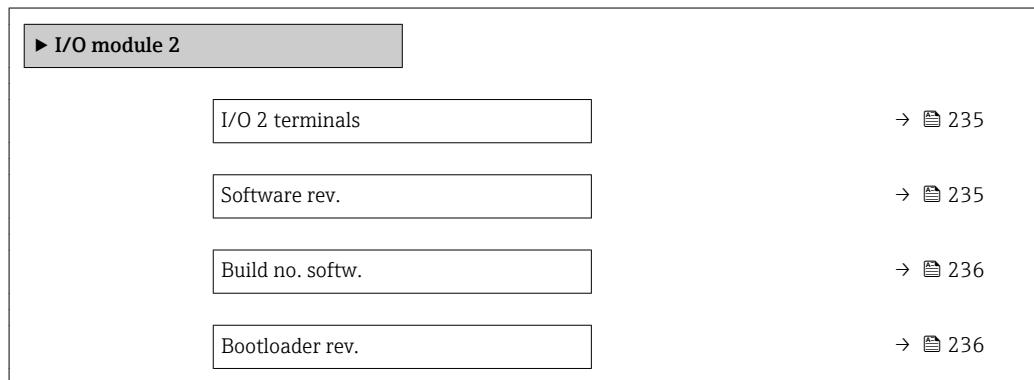
**Navigation**        Expert → Diagnostics → I/O module → Software rev. (0072)

**Description**      Use this function to display the software revision of the module.

**User interface**      Positive integer

### 3.12.7 "I/O module 2" submenu

*Navigation*        Expert → Diagnostics → I/O module 2



---

**I/O 2 terminals**

---

**Navigation**        Expert → Diagnostics → I/O module 2 → I/O 2 terminals (3902)

**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)

---

**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 2 → Build no. softw. (0079)

**Description** Use this function to display the software build number of the module.

**User interface** Positive integer

---

**Bootloader rev.**

---

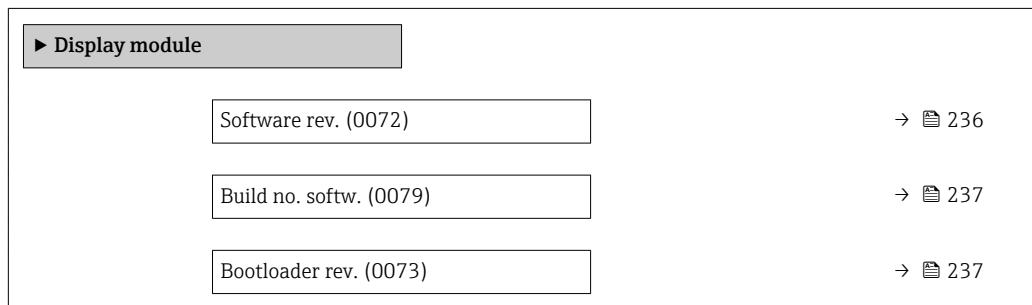
**Navigation**  Expert → Diagnostics → I/O module 2 → Bootloader rev. (0073)

**Description** Use this function to display the bootloader revision of the software.

**User interface** Positive integer

### 3.12.8 "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.**

<b>Navigation</b>	  Expert → Diagnostics → Display 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 → Display module → Bootloader rev. (0073)
<b>Description</b>	Use this function to display the bootloader revision of the software.
<b>User interface</b>	Positive integer

**3.12.9 "Min/max val." submenu***Navigation*  Expert → Diagnostics → Min/max val.

<b>► Min/max val.</b>	
Reset min/max (6151)	→  238
<b>► Main elect.temp.</b>	→  238
<b>► Sensor elec.temp</b>	→  239
<b>► Medium temp.</b>	→  240
<b>► Carr. pipe temp.</b>	→  241
<b>► Oscil. frequency</b>	→  242
<b>► Oscil. amplitude</b>	→  242
<b>► Oscil. damping</b>	→  243
<b>► Signal asymmetry</b>	→  244

**Reset min/max****Navigation**

Expert → Diagnostics → Min/max val. → Reset min/max (6151)

**Description**

Use this function to select measured variables whose minimum, maximum and average measured values are to be reset.

**Selection**

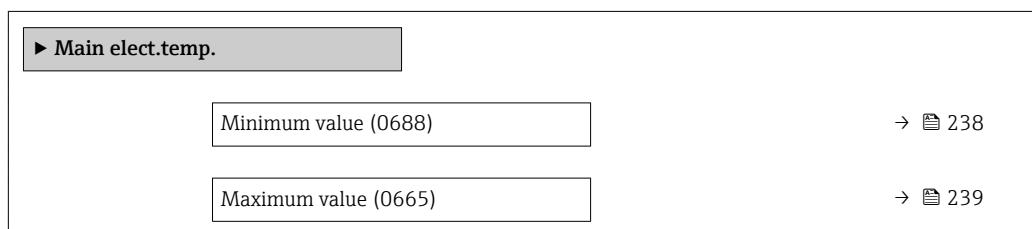
- Cancel
- Oscil. amplitude \*
- Oscil. damping
- Oscil. frequency
- Signal asymmetry

**Factory setting**

Cancel

**"Main electronic temperature" submenu****Navigation**

Expert → Diagnostics → Min/max val. → Main elect.temp.



---

**Minimum value****Navigation**

Expert → Diagnostics → Min/max val. → Main elect.temp. → Minimum value (0688)

**Description**

Displays the lowest previously measured temperature value of the electronics module in the transmitter.

**User interface**

Signed floating-point number

**Additional information***Dependency* The unit is taken from the **Temperature unit** parameter (→ [64](#))

---

\* Visibility depends on order options or device settings

---

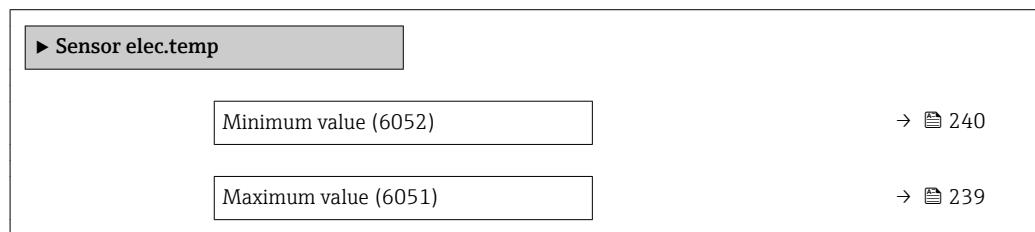
**Maximum value**

---

<b>Navigation</b>	Expert → Diagnostics → Min/max val. → Main elect.temp. → Maximum value (0665)
<b>Description</b>	Displays the highest previously measured temperature value of the electronics module in the transmitter.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<p><i>Dependency</i></p>  The unit is taken from the <b>Temperature unit</b> parameter (→ 64)

**"Sensor electronic temperature (ISEM)" submenu**

*Navigation*       Expert → Diagnostics → Min/max val. → Sensor elec.temp



---

**Maximum value**

---

<b>Navigation</b>	Expert → Diagnostics → Min/max val. → Sensor elec.temp → Maximum value (6051)
<b>Description</b>	Displays the highest previously measured temperature value of the electronics module in the sensor connection housing.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<p><i>Dependency</i></p>  The unit is taken from the <b>Temperature unit</b> parameter (→ 64)

---

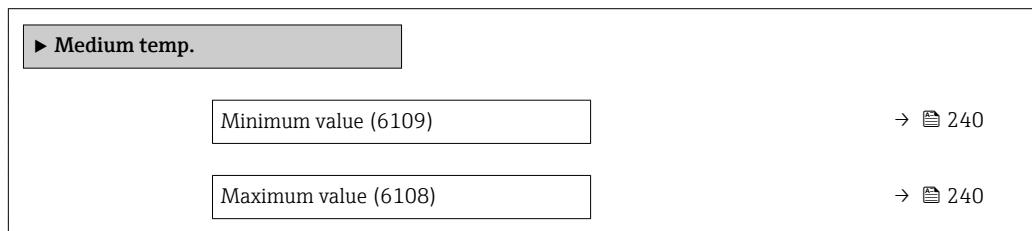
## Minimum value

---

<b>Navigation</b>	  Expert → Diagnostics → Min/max val. → Sensor elec.temp → Minimum value (6052)
<b>Description</b>	Displays the lowest previously measured temperature value of the electronics module in the sensor connection housing.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Temperature unit</b> parameter (→ <a href="#">64</a> )

### "Medium temp." submenu

*Navigation*        Expert → Diagnostics → Min/max val. → Medium temp.



---

## Minimum value

---

<b>Navigation</b>	  Expert → Diagnostics → Min/max val. → Medium temp. → Minimum value (6109)
<b>Description</b>	Displays the lowest previously measured medium temperature value.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Dependency</i>  The unit is taken from the <b>Temperature unit</b> parameter (→ <a href="#">64</a> )

---

## Maximum value

---

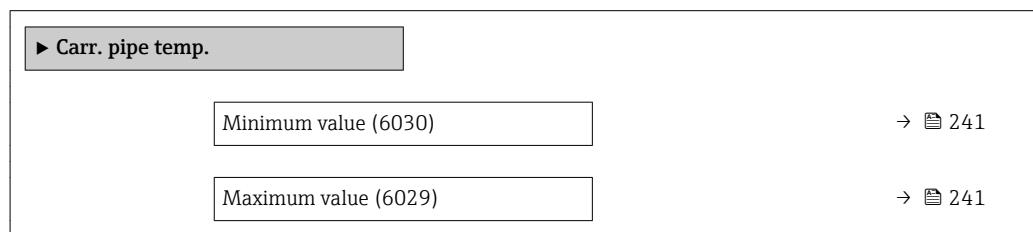
<b>Navigation</b>	  Expert → Diagnostics → Min/max val. → Medium temp. → Maximum value (6108)
<b>Description</b>	Displays the highest previously measured medium temperature value.
<b>User interface</b>	Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Temperature unit** parameter (→ [64](#))

**"Carr. pipe temp." submenu***Navigation*

Expert → Diagnostics → Min/max val. → Carr. pipe temp.



---

**Minimum value**

---

**Navigation**

Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Minimum value (6030)

**Prerequisite**

For the following order code  
"Application package", option **EB** "Heartbeat Verification + Monitoring"

**Description**

Displays the lowest previously measured temperature value of the carrier pipe.

**User interface**

Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Temperature unit** parameter (→ [64](#))

---

**Maximum value**

---

**Navigation**

Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Maximum value (6029)

**Prerequisite**

For the following order code  
"Application package", option **EB** "Heartbeat Verification + Monitoring"

**Description**

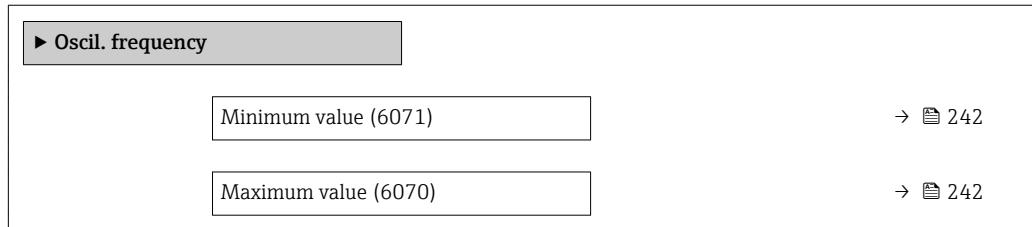
Displays the highest previously measured temperature value of the carrier pipe.

**User interface**

Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Temperature unit** parameter (→ [64](#))

**"Oscil. frequency" submenu****Navigation** Expert → Diagnostics → Min/max val. → Oscil. frequency

---

**Minimum value**

---

**Navigation** Expert → Diagnostics → Min/max val. → Oscil. frequency → Minimum value (6071)**Description**

Displays the lowest previously measured oscillation frequency.

**User interface**

Signed floating-point number

---

**Maximum value**

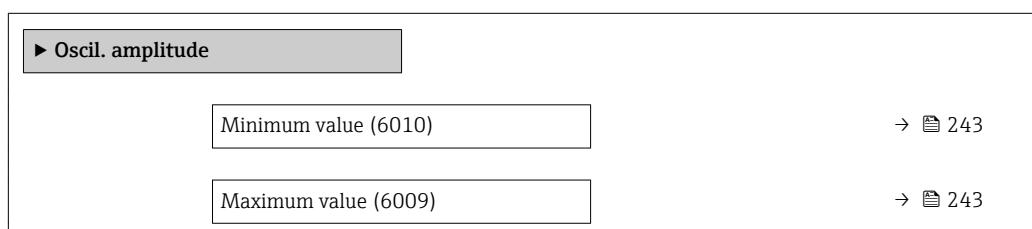
---

**Navigation** Expert → Diagnostics → Min/max val. → Oscil. frequency → Maximum value (6070)**Description**

Displays the highest previously measured oscillation frequency.

**User interface**

Signed floating-point number

**"Oscil. amplitude" submenu****Navigation** Expert → Diagnostics → Min/max val. → Oscil. amplitude

---

**Minimum value**

---

<b>Navigation</b>	Expert → Diagnostics → Min/max val. → Oscil. amplitude → Minimum value (6010)
<b>Description</b>	Displays the lowest previously measured oscillation amplitude.
<b>User interface</b>	Signed floating-point number

---

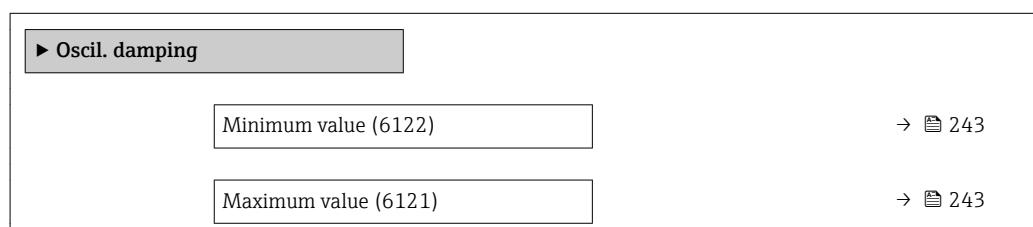
**Maximum value**

---

<b>Navigation</b>	Expert → Diagnostics → Min/max val. → Oscil. amplitude → Maximum value (6009)
<b>Description</b>	Displays the highest previously measured oscillation amplitude.
<b>User interface</b>	Signed floating-point number

**"Oscil. damping" submenu**

*Navigation*        Expert → Diagnostics → Min/max val. → Oscil. damping



---

**Minimum value**

---

<b>Navigation</b>	Expert → Diagnostics → Min/max val. → Oscil. damping → Minimum value (6122)
<b>Description</b>	Displays the lowest previously measured oscillation damping.
<b>User interface</b>	Signed floating-point number

---

**Maximum value**

---

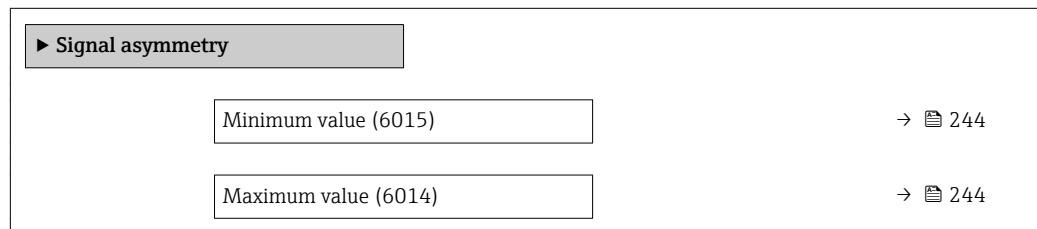
<b>Navigation</b>	Expert → Diagnostics → Min/max val. → Oscil. damping → Maximum value (6121)
<b>Description</b>	Displays the highest previously measured oscillation damping.

---

User interface	Signed floating-point number
----------------	------------------------------

#### "Signal asymmetry" submenu

Navigation      Expert → Diagnostics → Min/max val. → Signal asymmetry



---

#### Minimum value

Navigation	Expert → Diagnostics → Min/max val. → Signal asymmetry → Minimum value (6015)
------------	---

Description	Displays the lowest previously measured signal asymmetry.
-------------	---

User interface	Signed floating-point number
----------------	------------------------------

---

#### Maximum value

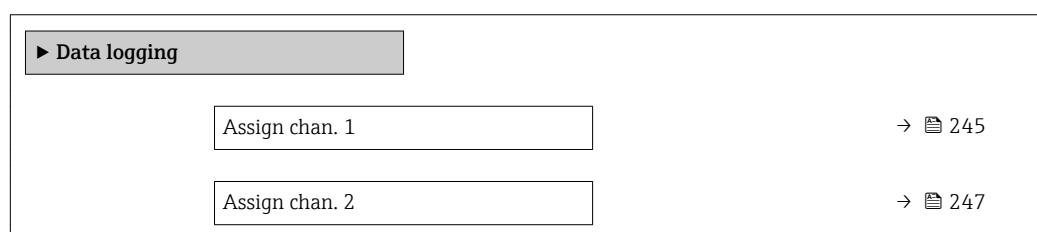
Navigation	Expert → Diagnostics → Min/max val. → Signal asymmetry → Maximum value (6014)
------------	---

Description	Displays the highest previously measured signal asymmetry.
-------------	--

User interface	Signed floating-point number
----------------	------------------------------

#### 3.12.10 "Data logging" submenu

Navigation      Expert → Diagnostics → Data logging



Assign chan. 3	→  247
Assign chan. 4	→  247
Logging interval	→  248
Clear logging	→  248
Data logging	→  249
Logging delay	→  249
Data log.control	→  249
Data log. status	→  250
Logging duration	→  250
► Displ.channel 1	→  251
► Displ.channel 2	→  252
► Displ.channel 3	→  252
► Displ.channel 4	→  253

## Assign chan. 1



### Navigation

Expert → Diagnostics → Data logging → Assign chan. 1 (0851)

### Prerequisite

The **Extended HistoROM** application package is available.

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 44).

### Description

Use this function to select a process variable for the data logging channel.

### Selection

- Off
- Mass flow
- Volume flow
- Correct.vol.flow \*
- Target mass flow \*
- Carrier mass fl. \*
- Target vol. flow \*
- Carrier vol. fl. \*
- Targ.corr.vol.fl \*
- Carr.corr.vol.fl \*

\* Visibility depends on order options or device settings

- Density \*
- Ref.density \*
- Ref.dens.altern. \*
- GSV flow \*
- GSVA \*
- NSV flow \*
- NSVa \*
- S&W volume flow \*
- Water cut \*
- Oil density \*
- Water density \*
- Oil mass flow
- Water mass flow \*
- Oil volume flow \*
- Water vol. flow \*
- Oil corr.vol.fl.
- Water corr.v.fl. \*
- Concentration \*
- Temperature
- Carr. pipe temp. \*
- Electronic temp.
- Osc. freq. 0
- Freq. fluct. 0 \*
- Oscil. amplitude \*
- Freq. fluct. 0 \*
- Osc. damping 0 \*
- Osc.damp.fluct 0 \*
- Signal asymmetry \*
- Exc. current 0 \*
- HBSI \*
- Curr.output 1 \*
- Pressure

**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.

*Selection*

 Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry**: **Assign freq.** parameter (→  119)

\* Visibility depends on order options or device settings

---

**Assign chan. 2**

<b>Navigation</b>	Expert → Diagnostics → Data logging → Assign chan. 2 (0852)
<b>Prerequisite</b>	The <b>Extended HistoROM</b> application package is available.
	The software options currently enabled are displayed in the <b>SW option overv.</b> parameter (→  44).
<b>Description</b>	Options for the assignment of a process variable to the data logging channel.
<b>Selection</b>	Picklist, see <b>Assign channel 1</b> parameter (→  245)
<b>Factory setting</b>	Off

---

**Assign chan. 3**

<b>Navigation</b>	Expert → Diagnostics → Data logging → Assign chan. 3 (0853)
<b>Prerequisite</b>	The <b>Extended HistoROM</b> application package is available.
	The software options currently enabled are displayed in the <b>SW option overv.</b> parameter (→  44).
<b>Description</b>	Options for the assignment of a process variable to the data logging channel.
<b>Selection</b>	Picklist, see <b>Assign channel 1</b> parameter (→  245)
<b>Factory setting</b>	Off

---

**Assign chan. 4**

<b>Navigation</b>	Expert → Diagnostics → Data logging → Assign chan. 4 (0854)
<b>Prerequisite</b>	The <b>Extended HistoROM</b> application package is available.
	The software options currently enabled are displayed in the <b>SW option overv.</b> parameter (→  44).
<b>Description</b>	Options for the assignment of a process variable to the data logging channel.
<b>Selection</b>	Picklist, see <b>Assign channel 1</b> parameter (→  245)
<b>Factory setting</b>	Off

## Logging interval



### Navigation

Expert → Diagnostics → Data logging → Logging interval (0856)

### Prerequisite

The **Extended HistoROM** application package is available.

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 44).

### 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:

- $T_{log} = 1000 \times 1 \text{ s} = 1\,000 \text{ s} \approx 15 \text{ min}$
- $T_{log} = 1000 \times 10 \text{ s} = 10\,000 \text{ s} \approx 3 \text{ h}$
- $T_{log} = 1000 \times 80 \text{ s} = 80\,000 \text{ s} \approx 1 \text{ d}$
- $T_{log} = 1000 \times 3\,600 \text{ s} = 3\,600\,000 \text{ s} \approx 41 \text{ d}$

## 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 (→ 44).

### 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

**Factory setting**

Overwriting

**Additional information***Selection*

- Overwriting  
The device memory applies the FIFO principle.
- Not overwriting  
Data logging is canceled if the measured value memory is full (single shot).

**Logging delay****Navigation**

Expert → Diagnostics → Data logging → Logging delay (0859)

**Prerequisite**

In the **Data logging** parameter (→ 249), the **Not overwriting** option is selected.

**Description**

Use this function to enter the time delay for measured value logging.

**User entry**

0 to 999 h

**Factory setting**

0 h

**Additional information***Description*

Once measured value logging has been started with the **Data log.control** parameter (→ 249), the device does not save any data for the duration of the time delay entered.

**Data log.control****Navigation**

Expert → Diagnostics → Data logging → Data log.control (0857)

**Prerequisite**

In the **Data logging** parameter (→ 249), the **Not overwriting** 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>	<i>Selection</i> <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

<b>Navigation</b>	 Expert → Diagnostics → Data logging → Data log. status (0858)
<b>Prerequisite</b>	In the <b>Data logging</b> parameter (→ 249), the <b>Not overwriting</b> option is selected.
<b>Description</b>	Displays the measured value logging status.
<b>User interface</b>	<ul style="list-style-type: none"><li>▪ Done</li><li>▪ Delay active</li><li>▪ Active</li><li>▪ Stopped</li></ul>
<b>Factory setting</b>	Done
<b>Additional information</b>	<i>Selection</i> <ul style="list-style-type: none"><li>▪ Done Measured value logging has been performed and completed successfully.</li><li>▪ Delay active Measured value logging has been started but the logging interval has not yet elapsed.</li><li>▪ Active The logging interval has elapsed and measured value logging is active.</li><li>▪ Stopped Measured value logging is stopped.</li></ul>

---

## Logging duration

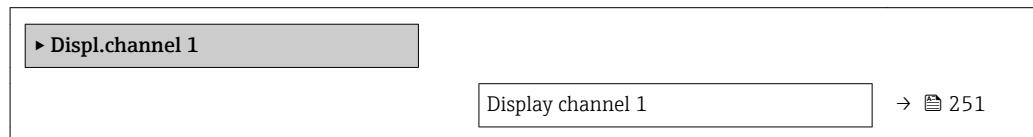
<b>Navigation</b>	 Expert → Diagnostics → Data logging → Logging duration (0861)
<b>Prerequisite</b>	In the <b>Data logging</b> parameter (→ 249), the <b>Not overwriting</b> option is selected.
<b>Description</b>	Displays the total logging duration.

**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 (→  44).

One of the following options is selected in the **Assign chan. 1** parameter (→  245):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow \*
- Carrier mass fl.\*
- Density
- Ref.density
- Concentration \*
- Carr. pipe temp. \*
- Electronic temp.
- Curr.output 1
- Osc. freq. 0
- Freq. fluct. 0
- Oscil. amplitude \*
- Osc. damping 0
- Osc.damp.fluct 0
- Signal asymmetry
- Exc. current 0

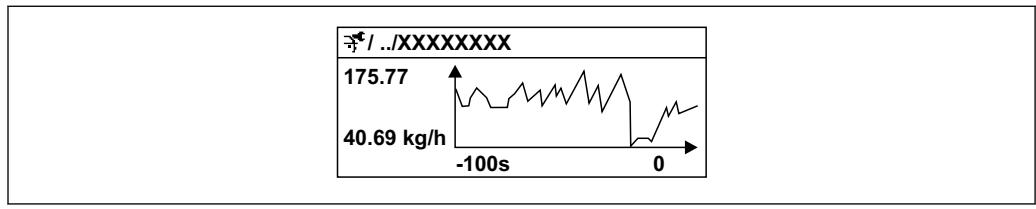
**Description** Displays the measured value trend for the logging channel in the form of a chart.

---

\* Visibility depends on order options or device settings

**Additional information***Prerequisite*

**i** Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry**: **Assign freq.** parameter (→ 119)

*Description*

A0016357

9 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**

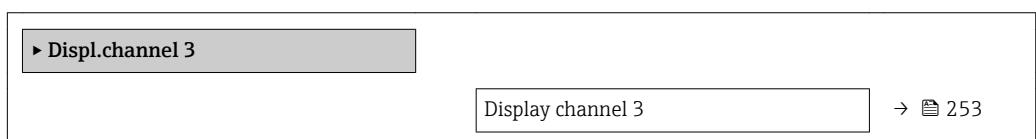
A process variable is defined in the **Assign chan. 2** parameter.

**Description**

See the **Display channel 1** parameter → 251

**"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 →  251

### "Displ.channel 4" submenu

*Navigation*  Expert → Diagnostics → Data logging → Displ.channel 4

 ▶ Displ.channel 4

Display channel 4

→  253

## 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 →  251

### 3.12.11 "Heartbeat" submenu

 For detailed information on the parameter descriptions for the **Heartbeat Verification+Monitoring** application package, refer to the Special Documentation for the device →  7

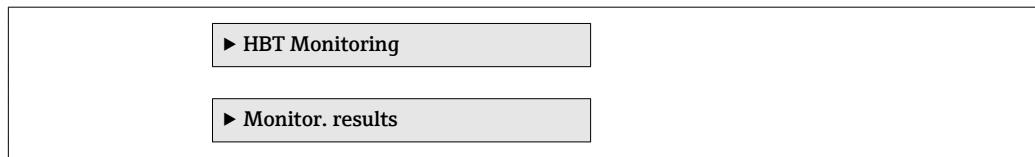
*Navigation*   Expert → Diagnostics → Heartbeat

 ▶ Heartbeat

 ▶ Base settings

 ▶ Perform.verific.

 ▶ Verific. results



### 3.12.12 "Simulation" submenu

Navigation

Expert → Diagnostics → Simulation

► Simulation	
Assign proc.var. (1810)	→ 255
Proc. var. value (1811)	→ 255
Status inp. sim. (1355)	→ 256
Signal level (1356)	→ 256
Curr.inp 1 to n sim. (1608-1 to n)	→ 257
Value curr.inp 1 to n (1609-1 to n)	→ 257
Curr.out. 1 to n sim. (0354-1 to n)	→ 257
Value curr.out 1 to n (0355-1 to n)	→ 258
FreqOutputSim 1 to n (0472-1 to n)	→ 258
Freq value 1 to n (0473-1 to n)	→ 259
Puls.outp.sim. 1 to n (0458-1 to n)	→ 259
Pulse value 1 to n (0459-1 to n)	→ 260
Switch sim. 1 to n (0462-1 to n)	→ 260
Switch status 1 to n (0463-1 to n)	→ 261
Relay out. 1 to n sim (0802-1 to n)	→ 261
Switch status 1 to n (0803-1 to n)	→ 262
Dev. alarm sim. (0654)	→ 262
Event category (0738)	→ 263
Diag. event sim. (0737)	→ 263

**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
- Mass flow
- Volume flow
- Correct.vol.flow \*
- Target vol. flow \*
- Carrier vol. fl.
- Targ.corr.vol.fl \*
- Carr.corr.vol.fl \*
- Density
- Ref.density \*
- Ref.dens.altern. \*
- GSV flow \*
- GSVA \*
- NSV flow \*
- NSVA \*
- S&W volume flow \*
- Water cut \*
- Oil density \*
- Water density \*
- Oil mass flow
- Water mass flow \*
- Oil volume flow \*
- Water vol. flow \*
- Oil corr.vol.fl.
- Water corr.v.fl. \*
- Density average \*
- Temp. average
- Temperature
- Concentration \*
- Target mass flow \*
- Carrier mass fl.

**Factory setting**

Off

**Additional information***Description*

The simulation value of the process variable selected is defined in the **Proc. var. value** parameter (→ 255).

**Proc. var. value****Navigation**

Expert → Diagnostics → Proc. var. value (1811)

**Prerequisite**

A process variable is selected in the **Assign proc.var.** parameter (→ 255).

\* Visibility depends on order options or device settings

---

<b>Description</b>	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.
<b>User entry</b>	Depends on the process variable selected
<b>Factory setting</b>	0
<b>Additional information</b>	<i>User entry</i>  The unit of the displayed measured value is taken from the <b>System units</b> submenu (→ 58).

---

## Status inp. sim.



<b>Navigation</b>	 Expert → Diagnostics → Simulation → Status inp. sim. (1355)
<b>Description</b>	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.
<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>Signal level</b> parameter (→ 256).  <i>Selection</i> <ul style="list-style-type: none"><li>▪ Off Simulation for the status input is switched off. The device is in normal measuring mode or another process variable is being simulated.</li><li>▪ On Simulation for the status input is active.</li></ul>

---

## Signal level



<b>Navigation</b>	 Expert → Diagnostics → Simulation → Signal level (1356)
<b>Prerequisite</b>	In the <b>Status inp. sim.</b> parameter (→ 256), the <b>On</b> option is selected.
<b>Description</b>	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.
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ High</li><li>▪ Low</li></ul>

**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

**Factory setting**

Off

**Additional information***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.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****Navigation**

Expert → Diagnostics → Simulation → Value curr.out 1 to n (0355–1 to n)

**Prerequisite**

In the **Curr.out. 1 to n sim.** parameter, the **On** option is selected.

**Description**

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.

**User entry**

3.59 to 22.5 mA

**Additional information***Dependency*

The input range is dependent on the option selected in the **Current span** parameter (→ 100).

---

**FreqOutputSim 1 to n****Navigation**

Expert → Diagnostics → Simulation → FreqOutputSim 1 to n (0472–1 to n)

**Prerequisite**

In the **Operating mode** parameter (→ 114), the **Frequency** option is selected.

**Description**

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.

**Selection**

- Off
- On

**Factory setting**

Off

**Additional information***Description*

The desired simulation value is defined in the **Freq value 1 to n** parameter.

*Selection*

- Off

Frequency simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.

- On

Frequency simulation is active.

---

**Freq value 1 to n****Navigation**

Diagram Expert → Diagnostics → Simulation → Freq value 1 to n (0473–1 to n)

**Prerequisite**

In the **FreqOutputSim 1 to n** parameter, the **On** 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**

Diagram Expert → Diagnostics → Simulation → Puls.outp.sim. 1 to n (0458–1 to n)

**Prerequisite**

In the **Operating mode** parameter (→ 114), 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 (→ 117).

**▪ Down-count. val.**

The pulses specified in the **Pulse value** parameter (→ 260) 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 (→ 114), 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.

---

**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 (→ 263).

**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 (→ 263).

## 4 Country-specific factory settings

### 4.1 SI units

**i** Not valid for USA and Canada.

#### 4.1.1 System units

Mass	kg
Mass flow	kg/h
Volume	l
Volume flow	l/h
Corrected volume	Nl
Corrected volume flow	Nl/h
Density	kg/l
Reference density	kg/Nl
Temperature	°C
Pressure	bar a

#### 4.1.2 Full scale values

**i** 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]	[kg/h]
1	4
2	20
4	90
6	200

#### 4.1.3 Output current span

Current output 1 to n	4 to 20 mA NAMUR
-----------------------	------------------

#### 4.1.4 Pulse value

Nominal diameter [mm]	[kg/p]
1	0.001
2	0.01
4	0.01
6	0.1

#### 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]	On-value for liquid [kg/h]
1	0.08
2	0.4
4	1.8
6	4

Nominal diameter [mm]	Switch-on value for gas [kg/h]
1	0.02
2	0.1
4	0.45
6	1

### 4.2 US units



Only valid for USA and Canada.

#### 4.2.1 System units

Mass	lb
Mass flow	lb/min
Volume	gal (us)
Volume flow	gal/min (us)
Corrected volume	Sft <sup>3</sup>
Corrected volume flow	Sft <sup>3</sup> /min
Density	lb/ft <sup>3</sup>
Reference density	lb/Sft <sup>3</sup>
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]	[lb/min]
1/24	0.15
1/12	0.75
1/8	3.3
1/4	7.4

### 4.2.3 Output current span

Current output 1 to n	4 to 20 mA US
-----------------------	---------------

### 4.2.4 Pulse value

Nominal diameter [in]	[lb/p]
1/24	0.002
1/12	0.02
1/8	0.02
1/4	0.2

### 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]	On-value for liquid [lb/min]
1/24	0.003
1/12	0.015
1/8	0.066
1/4	0.15

Nominal diameter [in]	Switch-on value for gas [lb/min]
1/24	0.001
1/12	0.004
1/8	0.016
1/4	0.0375

## 5 Explanation of abbreviated units

### 5.1 SI units

Process variable	Units	Explanation
Density	g/cm <sup>3</sup> , g/m <sup>3</sup>	Gram/volume unit
	kg/dm <sup>3</sup> , kg/l, kg/m <sup>3</sup>	Kilogram/volume unit
	SD4°C, SD15°C, SD20°C	Specific density: The specific density is the ratio of the density of the fluid to the density of water at a water temperature of 4 °C (39 °F), 15 °C (59 °F), 20 °C (68 °F).
	SG4°C, SG15°C, SG20°C	Specific gravity: The specific gravity is the ratio of the density of the fluid to the density of water at a water temperature of 4 °C (39 °F), 15 °C (59 °F), 20 °C (68 °F).
Pressure	Pa a, kPa a, MPa a	Pascal, kilopascal, megapascal (absolute)
	bar	Bar
	Pa g, kPa g, MPa g	Pascal, kilopascal, megapascal (relative/gauge)
	bar g	Bar (relative/gauge)
Mass	g, kg, t	Gram, kilogram, metric ton
Mass flow	g/s, g/min, g/h, g/d	Gram/time unit
	kg/s, kg/min, kg/h, kg/d	Kilogram/time unit
	t/s, t/min, t/h, t/d	Metric ton/time unit
Ref.density	kg/Nm <sup>3</sup> , kg/Nl, g/Scm <sup>3</sup> , kg/Sm <sup>3</sup>	Kilogram, gram/standard volume unit
Corrected volume	Nl, Nm <sup>3</sup> , Sm <sup>3</sup>	Normal liter, normal cubic meter, standard cubic meter
Correct.vol.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
Temperature	°C, K	Celsius, Kelvin
Volume	cm <sup>3</sup> , dm <sup>3</sup> , m <sup>3</sup>	Cubic centimeter, cubic decimeter, cubic meter
	ml, l, hl, Ml Mega	Milliliter, liter, hectoliter, megaliter
Volume flow	cm <sup>3</sup> /s, cm <sup>3</sup> /min, cm <sup>3</sup> /h, cm <sup>3</sup> /d	Cubic centimeter/time unit
	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
	ml/s, ml/min, ml/h, ml/d	Milliliter/time unit
	l/s, l/min, l/h, l/d	Liter/time unit
	hl/s, hl/min, hl/h, hl/d	Hectoliter/time unit
	Ml/s, Ml/min, Ml/h, Ml/d	Megaliter/time unit
Time	s, m, h, d, y	Second, minute, hour, day, year

### 5.2 US units

Process variable	Units	Explanation
Density	lb/ft <sup>3</sup> , lb/gal (us)	Pound/cubic foot, pound/gallon
	lb/bbl (us;liq.), lb/bbl (us;beer), lb/bbl (us;oil), lb/bbl (us;tank)	Pound/volume unit

Process variable	Units	Explanation
Pressure	psi a	Pounds per square inch (absolute)
	psi g	Pounds per square inch (gauge)
Mass	oz, lb, STon	Ounce, pound, standard ton
Mass flow	oz/s, oz/min, oz/h, oz/d	Ounce/time unit
	lb/s, lb/min, lb/h, lb/d	Pound/time unit
	STon/s, STon/min, STon/h, STon/d	Standard ton/time unit
Ref.density	lb/Sft <sup>3</sup>	Weight unit/standard volume unit
Corrected volume	Sft <sup>3</sup> , Sgal (us), Sbbl (us;liq.)	Standard cubic foot, standard gallon, standard barrel
Correct.vol.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
	Sgal/s (us), Sgal/min (us), Sgal/h (us), Sgal/d (us)	Standard gallon/time unit
	Sbbl/s (us;liq.), Sbbl/min (us;liq.), Sbbl/h (us;liq.), Sbbl/d (us;liq.)	Barrel/time unit (normal liquids)
Temperature	°F, °R	Fahrenheit, Rankine
Volume	af	Acre foot
	ft <sup>3</sup>	Cubic foot
	fl oz (us), gal (us), kgal (us), Mgal (us)	Fluid ounce, gallon, kilogallon, million gallon
	bbl (us;liq.), bbl (us;beer), bbl (us;oil), bbl (us;tank)	Barrel (normal liquids), barrel (beer), barrel (petrochemicals), barrel (filling tanks)
Volume flow	af/s, af/min, af/h, af/d	Acre foot/time unit
	ft <sup>3</sup> /s, ft <sup>3</sup> /min, ft <sup>3</sup> /h, ft <sup>3</sup> /d	Cubic foot/time unit
	fl oz/s (us), fl oz/min (us), fl oz/h (us), fl oz/d (us)	Fluid ounce/time unit
	gal/s (us), gal/min (us), gal/h (us), gal/d (us)	Gallon/time unit
	kgal/s (us), kgal/min (us), kgal/h (us), kgal/d (us)	Kilogallon/time unit
	Mgal/s (us), Mgal/min (us), Mgal/h (us), Mgal/d (us)	Million gallon/time unit
	bbl/s (us;liq.), bbl/min (us;liq.), bbl/h (us;liq.), bbl/d (us;liq.)	Barrel/time unit (normal liquids) Normal liquids: 31.5 gal/bbl
	bbl/s (us;beer), bbl/min (us;beer), bbl/h (us;beer), bbl/d (us;beer)	Barrel /time unit (beer) Beer: 31.0 gal/bbl
	bbl/s (us;oil), bbl/min (us;oil), bbl/h (us;oil), bbl/d (us;oil)	Barrel/time unit (petrochemicals) Petrochemicals: 42.0 gal/bbl
	bbl/s (us;tank), bbl/min (us;tank), bbl/h (us;tank), bbl/d (us;tank)	Barrel/time unit (filling tank) Filling tanks: 55.0 gal/bbl
Time	s, m, h, d, y	Second, minute, hour, day, year
	am, pm	Ante meridiem ( before midday), post meridiem (after midday)

### 5.3 Imperial units

Process variable	Units	Explanation
Density	lb/gal (imp), lb/bbl (imp;beer), lb/bbl (imp;oil)	Pound/volume unit
Corrected volume	Sgal (imp)	Standard gallon
Correct.vol.flow	Sgal/s (imp), Sgal/min (imp), Sgal/h (imp), Sgal/d (imp)	Standard gallon/time unit
Volume	gal (imp), Mgal (imp) bbl (imp;beer), bbl (imp;oil)	Gallon, mega gallon Barrel (beer), barrel (petrochemicals)
Volume flow	gal/s (imp), gal/min (imp), gal/h (imp), gal/d (imp)	Gallon/time unit
	Mgal/s (imp), Mgal/min (imp), Mgal/h (imp), Mgal/d (imp)	Mega gallon/time unit
	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
	bbl/s (imp;oil), bbl/min (imp;oil), bbl/h (imp;oil), bbl/d (imp;oil)	Barrel/time unit (petrochemicals) Petrochemicals: 34.97 gal/bbl
Time	s, m, h, d, y	Second, minute, hour, day, year
	am, pm	Ante meridiem ( before midday), post meridiem (after midday)

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