

Description of Device Parameters

Proline Promass 300

EtherNet/IP

Coriolis flowmeter

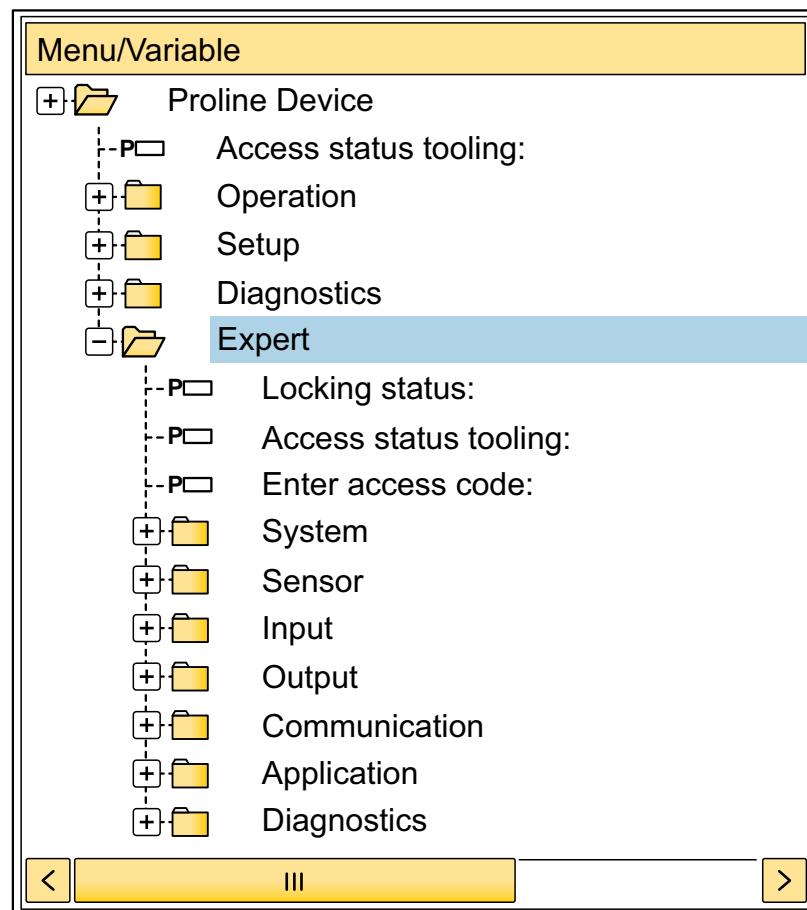


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1 About this document

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

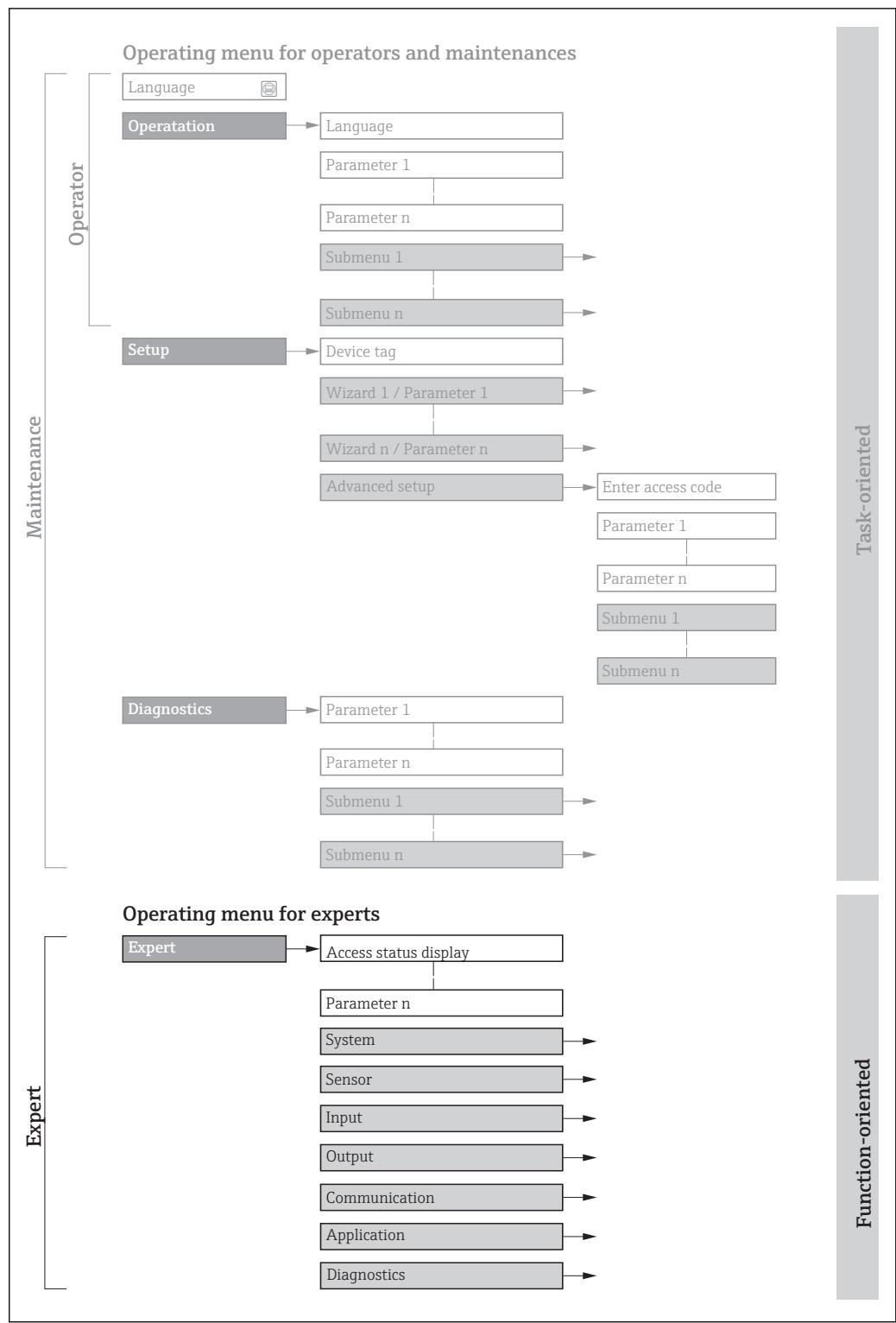
1.2 Target group

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
	Tip 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
Promass A 300 (8A3B**-...)	BA01699D
Promass A 300 (8A3C**-...)	BA01844D
Promass E 300	BA01727D
Promass F 300	BA01728D
Promass H 300	BA01729D
Promass I 300	BA01730D
Promass O 300	BA01731D
Promass P 300	BA01732D
Promass Q 300	BA01733D
Promass S 300	BA01734D
Promass X 300	BA01735D

1.5.2 Supplementary device-dependent documentation

Special documentation

Contents	Documentation code
Information on the Pressure Equipment Directive	SD01614D
Remote display and operating module DKX001	SD01763D
Radio approvals for WLAN interface for A309/A310 display module	SD01793D
Web server	SD01968D
Heartbeat Technology	SD01982D
Concentration measurement	SD02004
Petroleum	SD02096D
Viscosity measurement Promass I	SD01992
Viscosity measurement Promass Q	SD01996

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.

Expert	
Direct access (0106)	→ 11
Locking status (0004)	→ 12
Access status (0005)	→ 13
Ent. access code (0003)	→ 13
 System	→ 13
► Display	→ 14
► Config. backup	→ 29
► Diagn. handling	→ 32
► Administration	→ 41
 Sensor	→ 46
► Measured val.	→ 47
► System units	→ 61
► Process param.	→ 78
► Measurement mode	→ 86
► External comp.	→ 88
► Calculated value	→ 92
► Sensor adjustm.	→ 95
► Calibration	→ 102
 I/O config.	→ 103
I/O 1 to n terminals (3902–1 to n)	→ 104
I/O 1 to n info (3906–1 to n)	→ 104

I/O 1 to n type (3901-1 to n)	→ 105
Apply I/O config (3907)	→ 105
Alteration code (2762)	→ 105
▶ Input	→ 106
▶ Current input 1 to n	→ 106
▶ Status input 1 to n	→ 109
▶ Output	→ 111
▶ Curr.output 1 to n	→ 111
▶ PFS output 1 to n	→ 126
▶ Relay output 1 to n	→ 148
▶ Communication	→ 154
▶ Configuration	→ 155
▶ WLAN settings	→ 166
▶ Application	→ 172
Reset all tot. (2806)	→ 173
▶ Totalizer 1 to n	→ 173
▶ Viscosity	→ 178
▶ Concentration	→ 178
▶ Petroleum	→ 178
▶ Diagnostics	→ 179
Actual diagnos. (0691)	→ 179
Prev.diagnostics (0690)	→ 180
Time fr. restart (0653)	→ 181
Operating time (0652)	→ 181
▶ Diagnostic list	→ 182

▶ Event logbook	→ 186
▶ Device info	→ 188
▶ Main elec.+I/O1	→ 192
▶ Sens. electronic	→ 193
▶ I/O module 2	→ 195
▶ I/O module 3	→ 196
▶ Display module	→ 197
▶ Min/max val.	→ 198
▶ Data logging	→ 209
▶ Heartbeat	→ 218
▶ Simulation	→ 218

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	→ 46
▶ I/O config.	→ 103
▶ Input	→ 106
▶ Output	→ 111
▶ Communication	→ 154
▶ Application	→ 172
▶ Diagnostics	→ 179

Direct access



Navigation

Expert → Direct access (0106)

Description

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

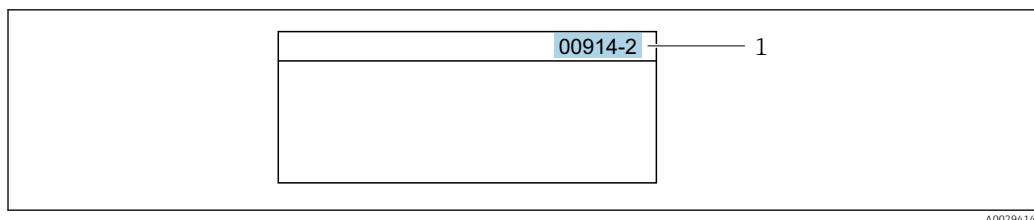
User entry

0 to 65 535

Additional information

User entry

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



1 Direct access code

Note the following when entering the direct access code:

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

Locking status

Navigation

Expert → Locking status (0004)

Description

Displays the active write protection.

User interface

- Hardware locked
- 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 Access status 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	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

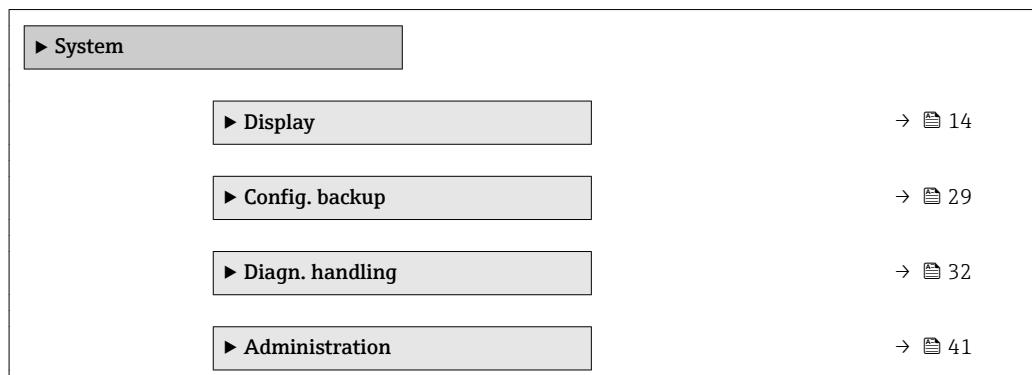
Navigation	  Expert → Access status (0005)
Description	Displays the access authorization to the parameters via the local display, Web browser or operating tool.
User interface	<ul style="list-style-type: none"> ▪ Operator ▪ Maintenance
Factory setting	Maintenance
Additional information	<p><i>Description</i></p> <p> Access authorization can be modified via the Ent. access code 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

Navigation	  Expert → Ent. access code (0003)
Description	Use this function to enter the user-specific release code to remove parameter write protection.
User entry	0 to 9 999

3.1 "System" submenu

Navigation   Expert → System



3.1.1 "Display" submenu

Navigation

Expert → System → Display

Topic	Page
► 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)	→ 21
Decimal places 2 (0117)	→ 22
Value 3 display (0110)	→ 23
0% bargraph 3 (0124)	→ 23
100% bargraph 3 (0126)	→ 24
Decimal places 3 (0118)	→ 24
Value 4 display (0109)	→ 24
Decimal places 4 (0119)	→ 25
Display interval (0096)	→ 25
Display damping (0094)	→ 26
Header (0097)	→ 26
Header text (0112)	→ 27
Separator (0101)	→ 28
Contrast display (0105)	→ 28
Backlight (0111)	→ 28

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.

* Visibility depends on order options or device settings

Additional information*Description*

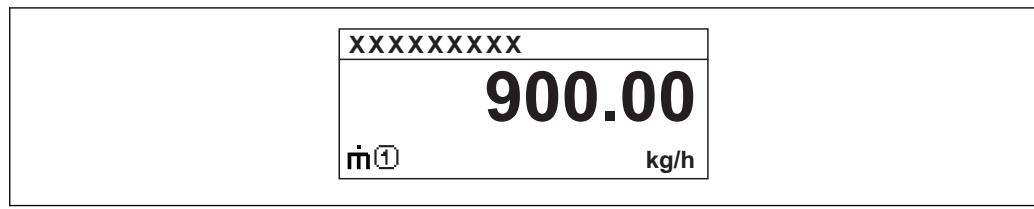
The display format (size, bar graph etc.) and number of measured values displayed simultaneously (1 to 4) can be configured. This setting only applies to normal operation.



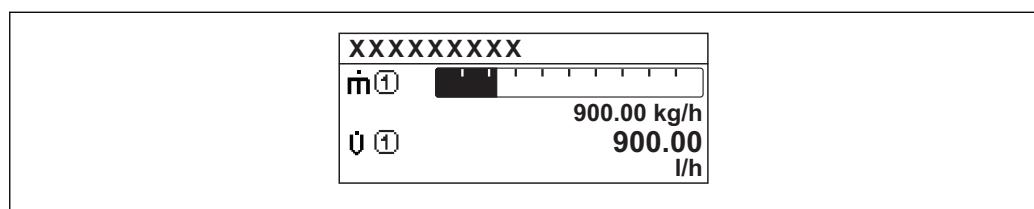
- The **Value 1 display** parameter (→ 18) to **Value 4 display** parameter (→ 24) are used to specify which measured values are shown on the local display and in what order.
- If more measured values are specified than the display mode selected permits, then the values alternate on the device display. The display time until the next change is configured via the **Display interval** parameter (→ 25).

Possible measured values shown on the local display:

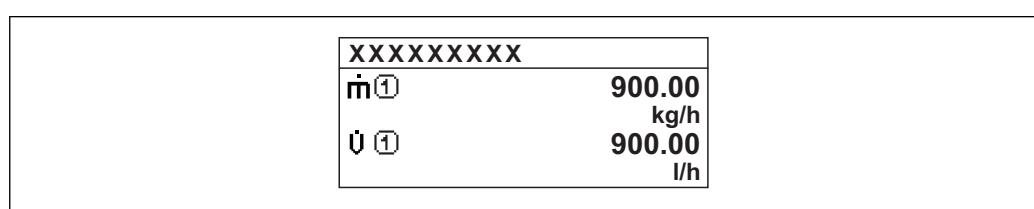
"1 value, max." option



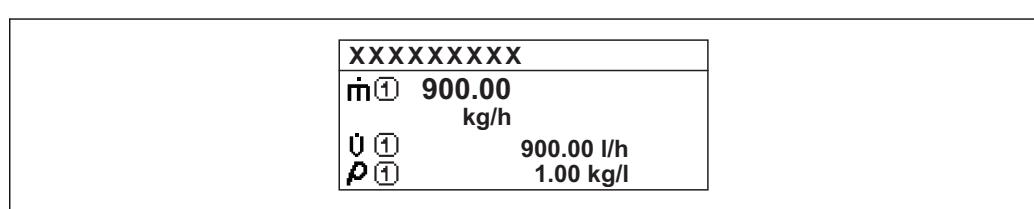
"Bagr. + 1 value" option



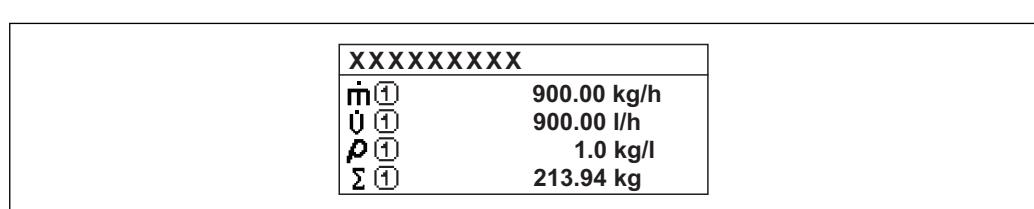
"2 values" option



"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
- 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
- Concentration ^{*}
- Dynam. viscosity ^{*}
- Kinematic visc.
- TempCompDynVisc ^{*}
- TempCompKinVisc ^{*}
- Temperature
- Carr. pipe temp. ^{*}
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 ^{*}
- Osc. ampl. 0 ^{*}
- Osc. ampl. 1 ^{*}
- Freq. fluct. 0
- Freq. fluct. 1 ^{*}
- Osc. damping 0 ^{*}
- Osc. damping 1 ^{*}
- Osc.damp.fluct 0
- Osc.damp.fluct 1 ^{*}
- Signal asymmetry

* Visibility depends on order options or device settings

- Exc. current 0
- Exc. current 1 *
- HBSI *
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Curr.output 1
- Curr.output 2 *
- Curr.output 3 *
- Pressure

Factory setting Mass flow

Additional information *Description*

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

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

Dependency

 The unit of the displayed measured value is taken from the **System units** submenu (→ 61).

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

* Visibility depends on order options or device settings

Factory setting	Country-specific: ■ 0 kg/h ■ 0 lb/min
Additional information	<p><i>Description</i></p> <p> The Format display parameter (→ 15) is used to specify that the measured value is to be displayed as a bar graph.</p> <p><i>User entry</i></p> <p> The unit of the displayed measured value is taken from the System units submenu (→ 61).</p>

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 → 228
Additional information	<p><i>Description</i></p> <p> The Format display parameter (→ 15) is used to specify that the measured value is to be displayed as a bar graph.</p> <p><i>User entry</i></p> <p> The unit of the displayed measured value is taken from the System units submenu (→ 61).</p>

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	<ul style="list-style-type: none">■ X■ X.X■ X.XX■ X.XXX■ X.XXXX
Factory setting	X.XX

Additional information*Description*

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

Value 2 display**Navigation**

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

Prerequisite

A local display is provided.

Description

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

Selection

- None
- 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 corr.v.fl.
- Oil corr.vol.fl.
- Water vol. flow
- Density average
- Temp. average
- Concentration
- Dynam. viscosity
- Kinematic visc.
- TempCompDynVisc
- TempCompKinVisc
- Temperature
- Carr. pipe temp.
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1
- Osc. ampl. 0
- Osc. ampl. 1
- Freq. fluct. 0

- Freq. fluct. 1
- Osc. damping 0
- Osc. damping 1
- Osc.damp.fluct 0
- Osc.damp.fluct 1
- Signal asymmetry
- Exc. current 0
- Exc. current 1
- HBSI
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Curr.output 1 *
- Curr.output 2 *
- Curr.output 3 *
- Curr.output 4 *
- Pressure

Factory setting None

Additional information *Description*

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.

 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 (→ 61).

Decimal places 2



Navigation

Expert → System → Display → Decimal places 2 (0117)

Prerequisite

A measured value is specified in the **Value 2 display** parameter (→ 21).

Description

Use this function to select the number of decimal places for measured value 2.

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.

* Visibility depends on order options or device settings

Value 3 display

Navigation	Expert → System → Display → Value 3 display (0110)
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 2 display parameter (→ 21)
Factory setting	None
Additional information	<i>Description</i> 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. <i>Selection</i> The unit of the displayed measured value is taken from the System units submenu (→ 61).

0% bargraph 3

Navigation	Expert → System → Display → 0% bargraph 3 (0124)
Prerequisite	A selection was made in the Value 3 display parameter (→ 23).
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: <ul style="list-style-type: none">■ 0 kg/h■ 0 lb/min
Additional information	<i>Description</i> The Format display parameter (→ 15) is used to specify that the measured value is to be displayed as a bar graph. <i>User entry</i> The unit of the displayed measured value is taken from the System units submenu (→ 61).

100% bargraph 3



Navigation

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

Prerequisite

A selection was made in the **Value 3 display** parameter (→ 23).

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 (→ 61).

Decimal places 3



Navigation

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

Prerequisite

A measured value is specified in the **Value 3 display** parameter (→ 23).

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 2 display parameter (→ 21)
Factory setting	None
Additional information	<p><i>Description</i></p> <p>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.</p> <p> The Format display parameter (→ 15) is used to specify how many measured values are displayed simultaneously and how.</p> <p><i>Selection</i></p> <p> The unit of the displayed measured value is taken from the System units submenu (→ 61).</p>

Decimal places 4



Navigation	 Expert → System → Display → Decimal places 4 (0119)
Prerequisite	A measured value is specified in the Value 4 display parameter (→ 24).
Description	Use this function to select the number of decimal places for measured value 4.
Selection	<ul style="list-style-type: none"> <input type="checkbox"/> X <input type="checkbox"/> X.X <input type="checkbox"/> X.XX <input type="checkbox"/> X.XXX <input type="checkbox"/> X.XXXX
Factory setting	x.xx
Additional information	<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>

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	<i>Description</i>
-------------------------------	--------------------

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 (→ 24) 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	<i>User entry</i>
-------------------------------	-------------------

Use this function to enter a time constant (PT1 element¹⁾) 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.
--------------------	--

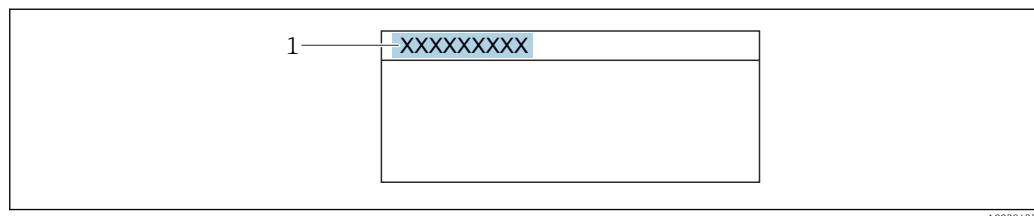
Selection	<ul style="list-style-type: none">■ Device tag■ Free text
------------------	--

Factory setting	Device tag
------------------------	------------

1) proportional transmission behavior with first order delay

Additional information*Description*

The header text only appears during normal operation.



A0029422

1 Position of the header text on the display

Selection

- Device tag
Is defined in the **Device tag** parameter (→ 189).
- Free text
Is defined in the **Header text** parameter (→ 27).

Header text**Navigation**

Expert → System → Display → Header text (0112)

Prerequisite

In the **Header** parameter (→ 26), the **Free text** option is selected.

Description

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

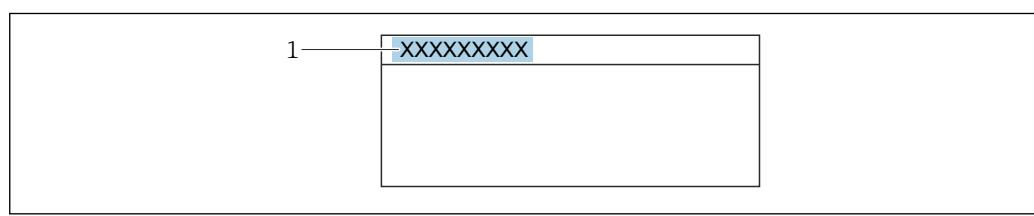
User entry

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

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

Selection

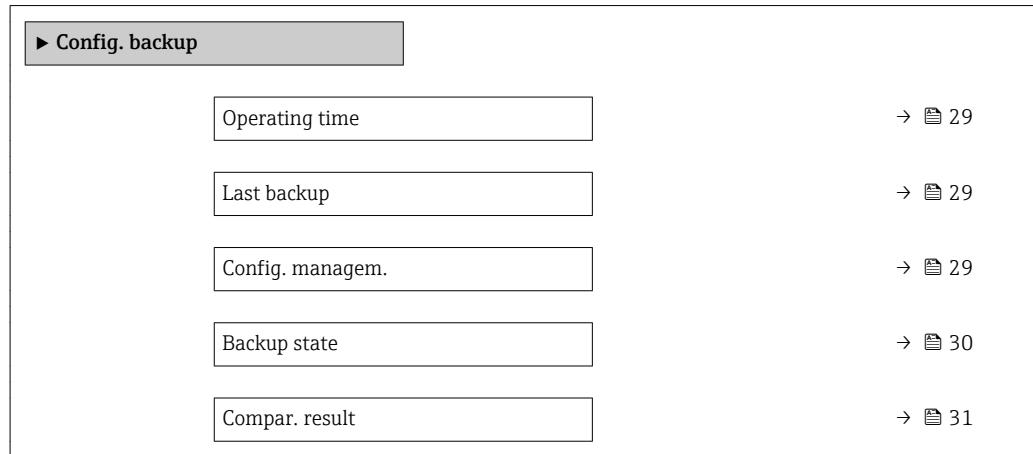
- Disable
- Enable

Factory setting Enable

3.1.2 "Configuration backup" submenu

Navigation

Expert → System → Config. backup



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

Additional information*Selection*

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

Factory setting

Check not done

Additional information*Description*

 The comparison is started via the **Compare** option in the **Config. managem.** parameter (→  29).

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 Config. managem. 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 incompr.	The backup copy in the device memory is not compatible with the device.

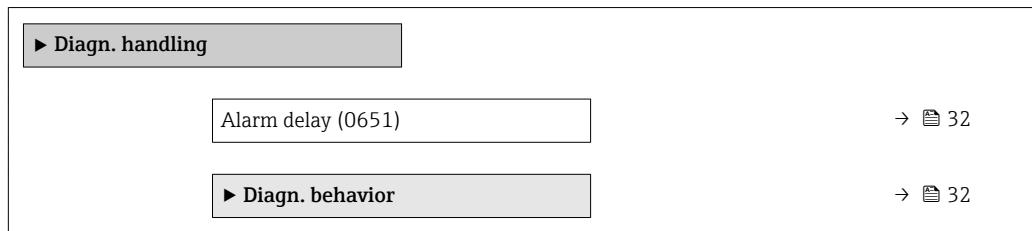
HistoROM

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 (→ 32).

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

Options	Description
Alarm	The device stops measurement. The totalizers assume the defined alarm condition. A diagnostic message is generated. The background lighting changes to red.
Warning	The device continues to measure. 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 Event logbook submenu (→ 186) (Event list submenu (→ 187)) and is not displayed in alternation with the operational display.
Off	The diagnostic event is ignored, and no diagnostic message is generated or entered.

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

Navigation

  Expert → System → Diagn. handling → Diagn. behavior

► Diagn. behavior

Diagnostic no. 046 (0709)	→ 34
Diagnostic no. 140 (0708)	→ 34
Diagnostic no. 144 (0731)	→ 35
Diagnostic no. 374 (0710)	→ 35
Diagnostic no. 302 (0739)	→ 35
Diagnostic no. 441 (0657)	→ 36
Diagnostic no. 442 (0658)	→ 36
Diagnostic no. 443 (0659)	→ 36
Diagnostic no. 444 (0740)	→ 37
Diagnostic no. 830 (0800)	→ 37
Diagnostic no. 831 (0641)	→ 37
Diagnostic no. 832 (0681)	→ 38
Diagnostic no. 833 (0682)	→ 38
Diagnostic no. 834 (0700)	→ 39
Diagnostic no. 835 (0702)	→ 39

Diagnostic no. 862 (0679)	→ 39
Diagnostic no. 912 (0703)	→ 40
Diagnostic no. 913 (0712)	→ 40
Diagnostic no. 944 (0732)	→ 40
Diagnostic no. 948 (0744)	→ 41

Diagnostic no. 046 (Sensor limit)



Navigation

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 046 (0709)

Description

Option for changing the diagnostic behavior of the diagnostic message **046 Sensor limit**.

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Alarm

Additional information

Detailed description of the options available for selection: → 33

Diagnostic no. 140 (Sensor sig.asym.)



Navigation

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 140 (0708)

Description

Option for changing the diagnostic behavior of the diagnostic message **140 Sensor sig.asym..**

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Alarm

Additional information

Detailed description of the options available for selection: → 33

Diagnostic no. 144 (MeasErrorTooHigh)

Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 144 (0731)
Description	Option for changing the diagnostic behavior of the diagnostic message 144 MeasErrorTooHigh .
Selection	<ul style="list-style-type: none"> ▪ Off ▪ Alarm ▪ Warning ▪ Logbook only
Factory setting	Alarm
Additional information	Detailed description of the options available for selection: → 33

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	<ul style="list-style-type: none"> ▪ Off ▪ Alarm ▪ Warning ▪ Logbook only
Factory setting	Warning
Additional information	Detailed description of the options available for selection: → 33

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	<ul style="list-style-type: none"> ▪ Alarm ▪ Warning
Factory setting	Warning
Additional information	Detailed description of the options available for selection: → 33

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: → 33

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

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 442 (0658)

Prerequisite

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

Description

Option for changing the diagnostic behavior of the diagnostic message **442 Freq. output 1 to n.**

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

Additional information

Detailed description of the options available for selection: → 33

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

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

Prerequisite

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

Description

Option for changing the diagnostic behavior of the diagnostic message **443 Pulse output 1 to n.**

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information  Detailed description of the options available for selection: → [33](#)

Diagnostic no. 444 (Current input 1 to n)

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

Prerequisite The device has one current input.

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

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information  Detailed description of the options available for selection: → [33](#)

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: → [33](#)

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	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook only
Factory setting	Warning
Additional information	 Detailed description of the options available for selection: → 33

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..
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook only
Factory setting	Logbook only
Additional information	 Detailed description of the options available for selection: → 33

Diagnostic no. 833 (Electronic temp.)



Navigation	  Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 833 (0682)
Description	Option for changing the diagnostic behavior of the diagnostic message 833 Electronic temp..
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook only
Factory setting	Logbook only
Additional information	 Detailed description of the options available for selection: → 33

Diagnostic no. 834 (Process temp.)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 834 (0700)
Description	Option for changing the diagnostic behavior of the diagnostic message 834 Process temp..
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook only
Factory setting	Warning
Additional information	Detailed description of the options available for selection: → 33

Diagnostic no. 835 (Process temp.)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 835 (0702)
Description	Option for changing the diagnostic behavior of the diagnostic message 835 Process temp..
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook only
Factory setting	Warning
Additional information	Detailed description of the options available for selection: → 33

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	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook only
Factory setting	Warning
Additional information	Detailed description of the options available for selection: → 33

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..**

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

Additional information

Detailed description of the options available for selection: → [33](#)

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

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 913 (0712)

Description

Option for changing the diagnostic behavior of the diagnostic message **913 Medium unsuitab..**

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

Additional information

Detailed description of the options available for selection: → [33](#)

Diagnostic no. 944 (MonitoringFailed)**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 944 (0732)

Description

Option for changing the diagnostic behavior of the diagnostic message **944 MonitoringFailed.**

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

Additional information

Detailed description of the options available for selection: → [33](#)

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

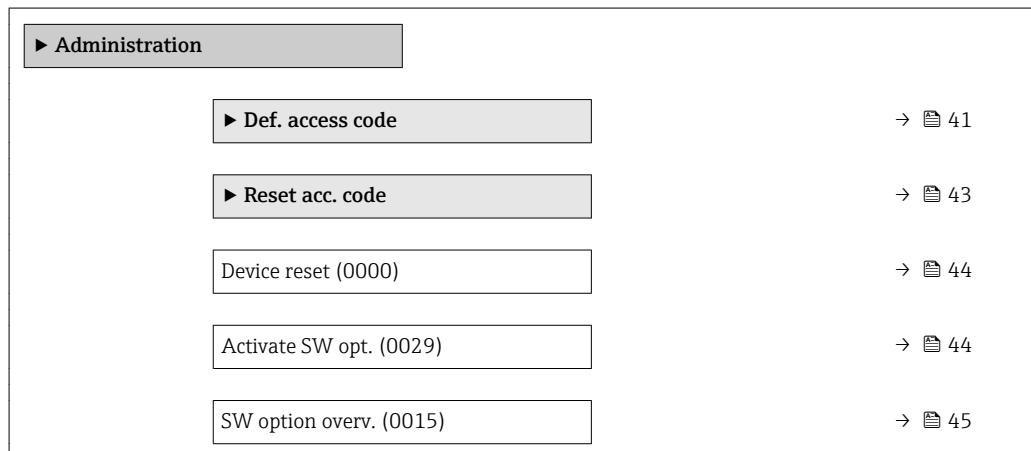
Warning

Additional information

Detailed description of the options available for selection: → [33](#)

3.1.4 "Administration" submenu*Navigation*

Expert → System → Administration

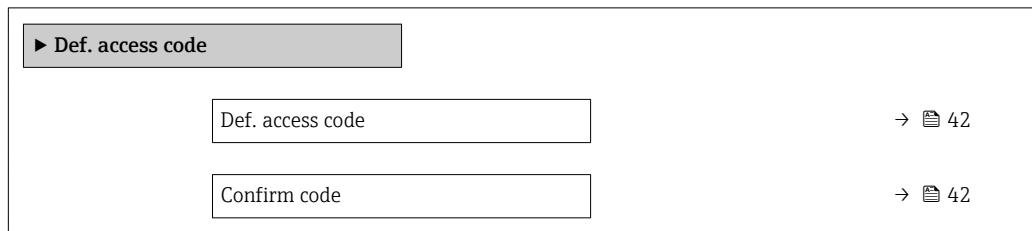
**"Def. access code" wizard**

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

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

Navigation

Expert → System → Administration → Def. access code

**Def. access code****Navigation**

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

Description

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

User entry

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

Additional information*Description*

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

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

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

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

User entry

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

Factory setting

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

Confirm code**Navigation**

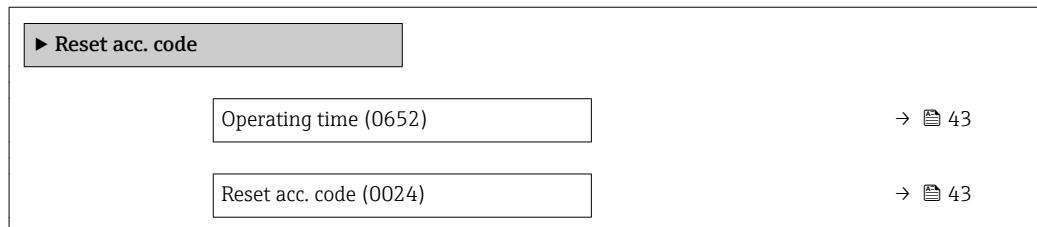
Expert → System → Administration → Def. access code → Confirm code

Description

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

User entry

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

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

Operating time

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

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

User interface

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

Additional information*User interface*

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

Reset acc. code

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

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

User entry

Character string comprising numbers, letters and special characters

Factory setting

0x00

Additional information*Description* For a reset code, contact your Endress+Hauser service organization.*User entry*

The reset code can only be entered via:

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

Additional parameters in the "Administration" submenu

Device reset



Navigation

Expert → System → Administration → Device reset (0000)

Description

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

Selection

- Cancel
- To delivery set.
- Restart device
- 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.

Activate SW opt.



Navigation

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

Description

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

User entry

Max. 10-digit string consisting of numbers.

Factory setting

Depends on the software option ordered

Additional information

Description

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

User entry

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

NOTE!

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

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

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

Example for a software option

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

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

Web browser

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

SW option overv.

Navigation

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

Description

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

User interface

- Extend. HistoROM
- HBT Monitoring
- HBT Verification
- Concentration
- Petroleum
- Viscosity
- HydrocaViscTrend

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" and option **EE** "Special density"

"Viscosity" option

 Only available for Promass I.

Order code for "Application package", option **EG** "Viscosity"

3.2 "Sensor" submenu

Navigation

  Expert → Sensor

 Sensor	
 Measured val.	→  47
 System units	→  61
 Process param.	→  78
 Measurement mode	→  86
 External comp.	→  88
 Calculated value	→  92
 Sensor adjustm.	→  95
 Calibration	→  102

3.2.1 "Measured values" submenu

Navigation

Expert → Sensor → Measured val.

► Measured val.	
► Process variab.	→ 47
► Totalizer	→ 55
► Input values	→ 56
► Output values	→ 58

"Process variab." submenu

Navigation

Expert → Sensor → Measured val. → Process variab.

► Process variab.	
Mass flow (1838)	→ 48
Volume flow (1847)	→ 48
Correct.vol.flow (1851)	→ 48
Density (1850)	→ 49
Ref.density (1852)	→ 49
Temperature (1853)	→ 49
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TempCompDynVisc (1872)	→ 51
TempCompKinVisc (1863)	→ 51
Concentration (1887)	→ 51
Target mass flow (1864)	→ 52
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Targ.corr.vol.fl (1893)	→ 53

Carr.corr.vol.fl (1894)	→ 53
Target vol. flow (1895)	→ 54
Carrier vol. fl. (1896)	→ 54

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 (→ 62)

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 (→ 63)

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 (→ 66)

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 (→ 67)

Ref.density**Navigation**

Expert → Sensor → Measured val. → Process variab. → Ref.density (1852)

Description

Displays the reference density currently calculated.

User interface

Signed floating-point number

Additional information*Dependency*

The unit is taken from the **Ref. dens. unit** parameter (→ 68)

Temperature**Navigation**

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

Description

Displays the medium temperature currently measured.

User interface

Signed floating-point number

Additional information*Dependency*

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

Pressure value

Navigation	 Expert → Sensor → Measured val. → Process variab. → Pressure value (6129)
Description	Displays the fixed or external pressure value.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Pressure unit parameter (→  69)

Dynam. viscosity

Navigation	 Expert → Sensor → Measured val. → Process variab. → Dynam. viscosity (1854)
Prerequisite	For the following order code: "Application package", option EG "Viscosity"  The software options currently enabled are displayed in the SW option overv. parameter (→  45).
Description	Displays the dynamic viscosity currently calculated.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Dyn. visc. unit parameter.

Kinematic visc.

Navigation	 Expert → Sensor → Measured val. → Process variab. → Kinematic visc. (1857)
Prerequisite	For the following order code: "Application package", option EG "Viscosity"  The software options currently enabled are displayed in the SW option overv. parameter (→  45).
Description	Displays the kinematic viscosity currently calculated.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Kin. visc. unit parameter (0578).

TempCompDynVisc

Navigation	 Expert → Sensor → Measured val. → Process variab. → TempCompDynVisc (1872)
Prerequisite	For the following order code: "Application package", option EG "Viscosity"  The software options currently enabled are displayed in the SW option overv. parameter (→  45).
Description	Displays the temperature compensation currently calculated for the viscosity.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Dyn. visc. unit parameter.

TempCompKinVisc

Navigation	 Expert → Sensor → Measured val. → Process variab. → TempCompKinVisc (1863)
Prerequisite	For the following order code: "Application package", option EG "Viscosity"  The software options currently enabled are displayed in the SW option overv. parameter (→  45).
Description	Displays the temperature compensation currently calculated for the kinetic viscosity.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Kin. visc. unit parameter (0578).

Concentration

Navigation	 Expert → Sensor → Measured val. → Process variab. → Concentration (1887)
Prerequisite	For the following order code: Order code for "Application package", option ED "Concentration"  The software options currently enabled are displayed in the SW option overv. parameter (→  45).
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 (→ 45).

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 (→ 62)

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 (→ 45).

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 (→ 62)

Targ.corr.vol.fl

Navigation	  Expert → Sensor → Measured val. → Process variab. → Targ.corr.vol.fl (1893)
Prerequisite	With the following conditions: <ul style="list-style-type: none">▪ Order code for "Application package", option ED "Concentration"▪ In the Liquid type parameter, the Ethanol in water option or %mass / %volume option is selected. <p> The software options currently enabled are displayed in the SW option overv. parameter (→  45).</p>
Description	Displays the corrected volume flow currently measured for the target fluid.
User interface	Signed floating-point number
Additional information	<i>Dependency</i> <p> The unit is taken from the Volume flow unit parameter (→  63)</p>

Carr.corr.vol.fl

Navigation	  Expert → Sensor → Measured val. → Process variab. → Carr.corr.vol.fl (1894)
Prerequisite	With the following conditions: <ul style="list-style-type: none">▪ Order code for "Application package", option ED "Concentration"▪ In the Liquid type parameter, the Ethanol in water option or %mass / %volume option is selected. <p> The software options currently enabled are displayed in the SW option overv. parameter (→  45).</p>
Description	Displays the corrected volume flow currently measured for the carrier fluid.
User interface	Signed floating-point number
Additional information	<i>Dependency</i> <p> The unit is taken from the Volume flow unit parameter (→  63)</p>

Target vol. flow

Navigation   Expert → Sensor → Measured val. → Process variab. → Target vol. flow (1895)

Prerequisite

With the following conditions:

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

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

Description

Displays the volume flow currently measured for the target medium.

User interface

Signed floating-point number

Additional information

Dependency

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

Carrier vol. fl.

Navigation   Expert → Sensor → Measured val. → Process variab. → Carrier vol. fl. (1896)

Prerequisite

With the following conditions:

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

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

Description

Use this function to display the volume flow currently measured for the carrier medium.

User interface

Signed floating-point number

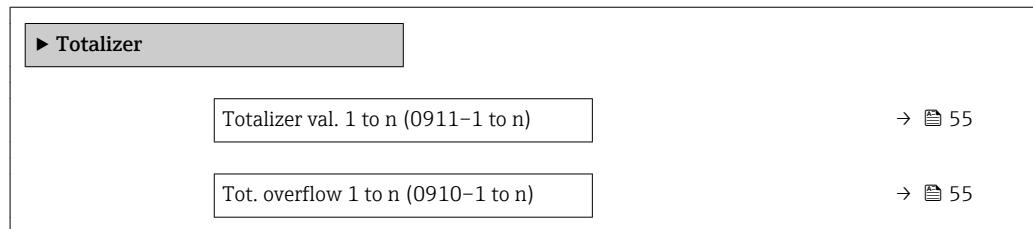
Additional information

Dependency

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

"Totalizer" submenu*Navigation*

Expert → Sensor → Measured val. → Totalizer

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

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

Prerequisite

A process variable is selected in the **Assign variable** parameter (→ 173) of the **Totalizer 1 to n** submenu.

Description

Displays the current totalizer reading.

User interface

Signed floating-point number

Additional information*Description*

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

In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→ 177).

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 (→ 175).

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 174).

Example

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

- Value in the **Totalizer val. 1** parameter: 1 968 457 m³
- Value in the **Tot. overflow 1** parameter: $1 \cdot 10^7$ (1 overflow) = 10 000 000 [m³]
- Current totalizer reading: 11 968 457 m³

Tot. overflow 1 to n**Navigation**

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

Prerequisite

A process variable is selected in the **Assign variable** parameter (→ 173) of the **Totalizer 1 to n** submenu.

Description Displays the current totalizer overflow.

User interface Integer with sign

Additional information

Description

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

User interface

 The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ [174](#)).

Example

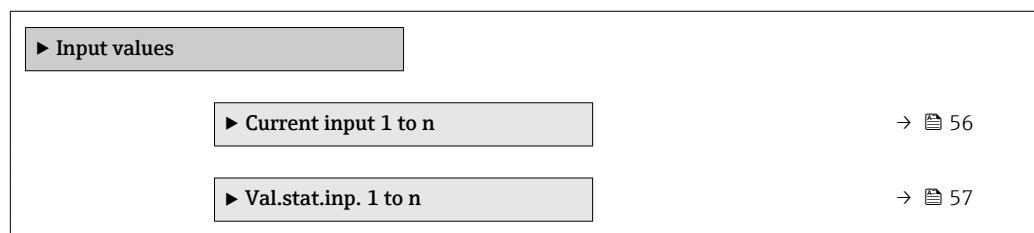
Calculation of the current totalizer reading when the value exceeds the 7-digit display range of the operating tool:

- Value in the **Totalizer val. 1** parameter: 1968457 m³
- Value in the **Tot. overflow 1** parameter: $2 \cdot 10^7$ (2 overflows) = 20 000 000 [m³]
- Current totalizer reading: 21968457 m³

"Input values" submenu

Navigation

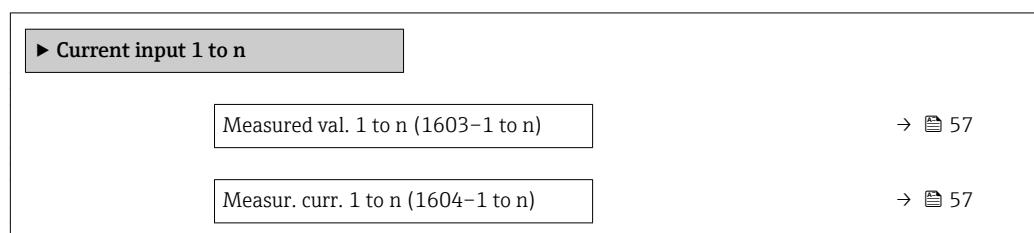
 Expert → Sensor → Measured val. → Input values



"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. 1 to n

Val.stat.inp. (1353–1 to n)

→ 57

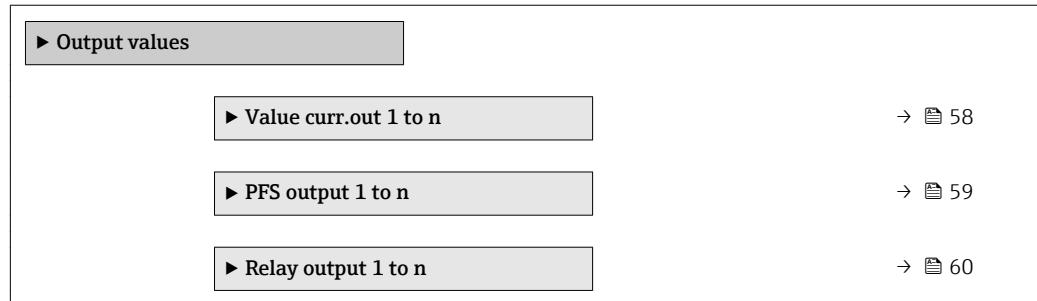
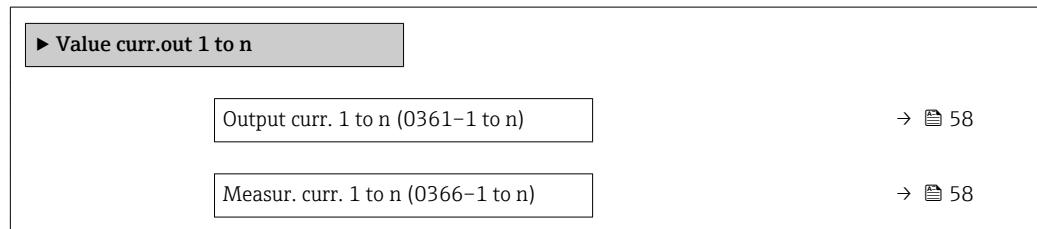
Val.stat.inp.

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

Description Displays the current input signal level.

User interface

- High
- Low

"Output values" submenu**Navigation** Expert → Sensor → Measured val. → Output values**"Value current output 1 to n" submenu****Navigation** Expert → Sensor → Measured val. → Output values → Value curr.out 1 to n

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

Displays the current value currently calculated for the current output.

User interface

0 to 22.5 mA

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

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

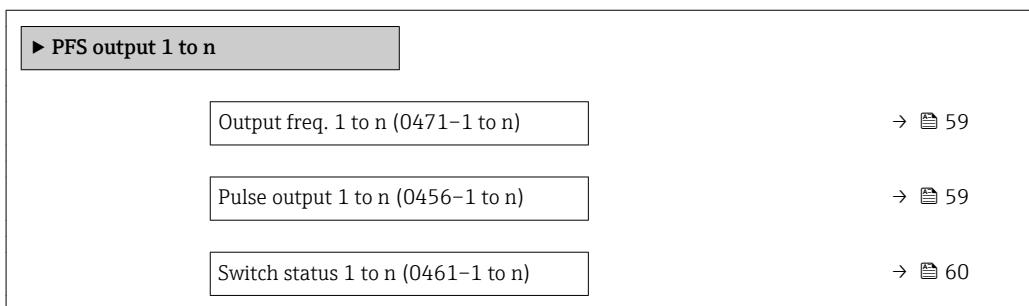
User interface

0 to 30 mA

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

Navigation

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



Output freq. 1 to n

Navigation

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

Prerequisite

In the **Operating mode** parameter (→ 128), the **Frequency** option is selected.

Description

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

User interface

0.0 to 12 500.0 Hz

Pulse output 1 to n

Navigation

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

Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (→ 128) parameter.

Description

Displays the pulse frequency currently output.

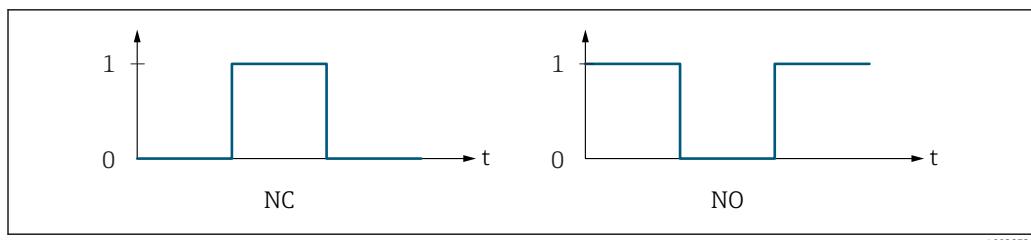
User interface

Positive floating-point number

Additional information

Description

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



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

The output behavior can be reversed via the **Invert outp.sig.** parameter (→ 147) i.e. the transistor does not conduct for the duration of the pulse.

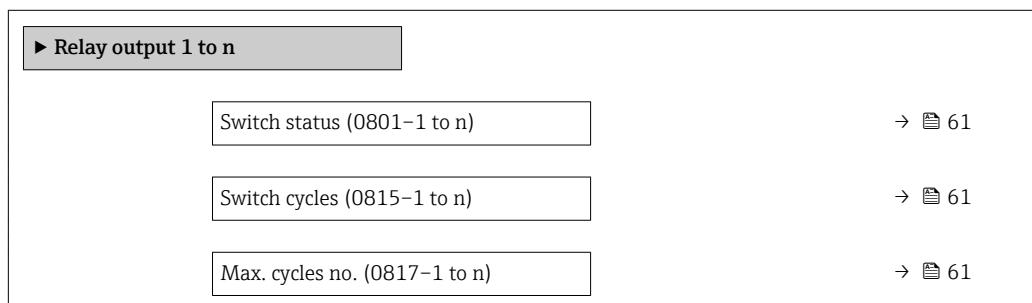
In addition, the behavior of the output in the event of a device alarm (**Failure mode** parameter (→ 132)) can be configured.

Switch status 1 to n

Navigation	Expert → Sensor → Measured val. → Output values → PFS output 1 to n → Switch status 1 to n (0461-1 to n)
Prerequisite	The Switch option is selected in the Operating mode parameter (→ 128).
Description	Displays the current switch status of the status output.
User interface	<ul style="list-style-type: none"> ▪ Open ▪ Closed
Additional information	<p><i>User interface</i></p> <ul style="list-style-type: none"> ▪ Open The switch output is not conductive. ▪ Closed The switch output is conductive.

"Relay output 1 to n" submenu

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



Switch status

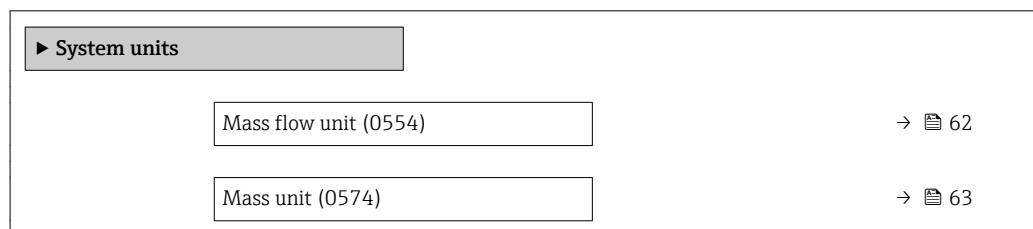
Navigation	  Expert → Sensor → Measured val. → Output values → Relay output 1 to n → Switch status (0801–1 to n)
Description	Displays the current status of the relay output.
User interface	<ul style="list-style-type: none"> ▪ Open ▪ Closed
Additional information	<p><i>User interface</i></p> <ul style="list-style-type: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

Switch cycles

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

Max. cycles no.

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

3.2.2 "System units" submenu*Navigation*  Expert → Sensor → System units

Volume flow unit (0553)	→ 63
Volume unit (0563)	→ 65
Cor.volflow unit (0558)	→ 66
Corr. vol. unit (0575)	→ 66
Density unit (0555)	→ 67
Ref. dens. unit (0556)	→ 68
Temperature unit (0557)	→ 69
Pressure unit (0564)	→ 69
Date/time format (2812)	→ 70

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 (DN > 150 (6"): t/h)
- lb/min

Additional information*Result*

The selected unit applies for:

- **Target mass flow** parameter (→ 52)
- **Carrier mass fl.** parameter (→ 52)
- **Mass flow** parameter (→ 48)

Selection

 For an explanation of the abbreviated units: → 234

Customer-specific units

 The unit for the customer-specific mass is specified in the **Mass text** parameter (→ 72).

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 (DN > 150 (6"): t)
- lb

Additional information*Selection*

 For an explanation of the abbreviated units: → 234

Customer-specific units

 The unit for the customer-specific mass is specified in the **Mass text** parameter (→ 72).

Volume flow unit**Navigation**

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

Description

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

Selection

<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
■ cm ³ /s	■ af/s	■ gal/s (imp)
■ cm ³ /min	■ af/min	■ gal/min (imp)
■ cm ³ /h	■ af/h	■ gal/h (imp)
■ cm ³ /d	■ af/d	■ gal/d (imp)
■ dm ³ /s	■ ft ³ /s	■ Mgal/s (imp)
■ dm ³ /min	■ ft ³ /min	■ Mgal/min (imp)
■ dm ³ /h	■ ft ³ /h	■ Mgal/h (imp)
■ dm ³ /d	■ ft ³ /d	■ Mgal/d (imp)
■ m ³ /s	■ fl oz/s (us)	■ bbl/s (imp;oil)
■ m ³ /min	■ fl oz/min (us)	■ bbl/min (imp;oil)
■ m ³ /h	■ fl oz/h (us)	■ bbl/h (imp;oil)
■ m ³ /d	■ fl oz/d (us)	■ bbl/d (imp;oil)
■ ml/s	■ gal/s (us)	
■ ml/min	■ gal/min (us)	
■ ml/h	■ gal/h (us)	
■ ml/d	■ gal/d (us)	
■ l/s	■ kgal/s (us)	
■ l/min	■ kgal/min (us)	
■ l/h	■ kgal/h (us)	
■ l/d	■ kgal/d (us)	
■ hl/s	■ Mgal/s (us)	
■ hl/min	■ Mgal/min (us)	
■ hl/h	■ Mgal/h (us)	
■ hl/d	■ Mgal/d (us)	
■ Ml/s	■ bbl/s (us;oil)	
■ Ml/min	■ bbl/min (us;oil)	
■ Ml/h	■ bbl/h (us;oil)	
■ Ml/d	■ bbl/d (us;oil)	
	■ bbl/s (us;tank)	
	■ bbl/min (us;tank)	
	■ bbl/h (us;tank)	
	■ bbl/d (us;tank)	

or

<i>US units</i>	<i>Imperial units</i>
■ bbl/s (us;liq.)	■ bbl/s (imp;beer)
■ bbl/min (us;liq.)	■ bbl/min (imp;beer)
■ bbl/h (us;liq.)	■ bbl/h (imp;beer)
■ bbl/d (us;liq.)	■ bbl/d (imp;beer)
■ bbl/s (us;beer)	
■ bbl/min (us;beer)	
■ bbl/h (us;beer)	
■ bbl/d (us;beer)	

Factory setting

Country-specific:
■ l/h (DN > 150 (6"): m ³ /h)
■ gal/min (us)

Additional information*Result*

The selected unit applies for:
Volume flow parameter (→ 48)

Selection

For an explanation of the abbreviated units: → 234

Customer-specific units

The unit for the customer-specific volume is specified in the **Volume text** parameter (→ 71).

Volume unit**Navigation**

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

Description

Use this function to select the unit for the volume.

Selection*SI units*

- cm³
- dm³
- m³
- ml
- l
- hl
- Ml Mega

US units

- af
- ft³
- 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)

Factory setting

Country-specific:

- l (DN > 150 (6"): m³)
- gal (us)

Additional information*Selection*

For an explanation of the abbreviated units: → 234

Customer-specific units

The unit for the customer-specific volume is specified in the **Volume text** parameter (→ 71).

Cor.volflow unit**Navigation**

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

Description

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

Selection*SI units*

- NI/s
- NI/min
- NI/h
- NI/d
- Nm³/s
- Nm³/min
- Nm³/h
- Nm³/d
- Sm³/s
- Sm³/min
- Sm³/h
- Sm³/d

US units

- Sft³/s
- Sft³/min
- Sft³/h
- Sft³/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:

- NI/h (DN > 150 (6"): Nm³/h)
- Sft³/min

Additional information*Result*

The selected unit applies for:

Correct.vol.flow parameter (→ 48)

Selection

For an explanation of the abbreviated units: → 234

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*

- NI
- Nm³
- Sm³

US units

- Sft³
- Sgal (us)
- Sbbl (us;liq.)

Imperial units

Sgal (imp)

Factory setting

Country-specific:

- NI (DN > 150 (6"): Nm³)
- Sft³

Additional information*Selection*

For an explanation of the abbreviated units: → 234

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/cm³
- g/m³
- g/ml
- kg/l
- kg/dm³
- kg/m³
- SD4°C
- SD15°C
- SD20°C
- SG4°C
- SG15°C
- SG20°C

US units

- lb/ft³
- lb/gal (us)
- lb/bbl (us;oil)
- lb/bbl (us;tank)

Imperial units

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

or

US units

SG60°F

Other units

°API

Other units

°API

or

US units

- lb/bbl (us;liq.)
- lb/bbl (us;beer)

Imperial units

lb/bbl (imp;beer)

Factory setting

Country-specific:

- kg/l
- lb/ft³

Additional information*Result*

The selected unit applies for:

- **Density setpt 1** parameter
- **Density setpt 2** parameter
- **Density** parameter (→ [49](#))

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: → [234](#)

Customer-specific units

 The unit for the customer-specific density is specified in the **Density text** parameter (→ [75](#)).

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/Nm³
- kg/Nl
- g/Scm³
- kg/Sm³
- RD15°C
- RD20°C

US units

- lb/Sft³
- RD60°F

Other units

- °APIbase

Factory setting

Country-dependent

- kg/Nl
- lb/Sft³

Additional information*Result*

The selected unit applies for:

- **Ext. ref.density** parameter (→ [93](#))
- **Fix ref.density** parameter (→ [93](#))
- **Ref.density** parameter (→ [49](#))

Selection

 For an explanation of the abbreviated units: → [234](#)

Temperature unit

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

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

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

Factory setting Country-specific:

- °C
- °F

Additional information *Result*

The selected unit applies for:

- **Maximum value** parameter (→ 200)
- **Minimum value** parameter (→ 200)
- **Maximum value** parameter (→ 201)
- **Minimum value** parameter (→ 200)
- **Maximum value** parameter (→ 202)
- **Minimum value** parameter (→ 201)
- **External temp.** parameter (→ 91)
- **Ref. temperature** parameter (6222)
- **Temperature** parameter (→ 49)
- **Ref. temperature** parameter (→ 93)

Selection

For an explanation of the abbreviated units: → 234

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>
	▪ Pa a	▪ psi a
	▪ kPa a	▪ psi g
	▪ MPa a	
	▪ bar	
	▪ Pa g	
	▪ kPa g	
	▪ MPa g	
	▪ bar g	

Factory setting Country-specific:

- bar a
- psi a

Additional information*Result*

The unit is taken from:

- **Pressure value** parameter (→ 89)
- **External press.** parameter (→ 90)
- **Pressure value** parameter (→ 50)

Selection

 For an explanation of the abbreviated units: → 234

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: → 234

"User-spec. units" submenu**Navigation**

 Expert → Sensor → System units → User-spec. units

► User-spec. units	
Volume text (0567)	→ 71
Volume offset (0569)	→ 72
Volume factor (0568)	→ 72
Mass text (0560)	→ 72
Mass offset (0562)	→ 73
Mass factor (0561)	→ 73
Corr. vol. text (0592)	→ 74

Corr vol. offset (0602)	→ 74
Cor.vol. factor (0590)	→ 74
Density text (0570)	→ 75
Density offset (0571)	→ 75
Density factor (0572)	→ 75
Spec. enth. text (0585)	→ 75
Spec. enth. off. (0584)	→ 76
Spec. enth. fac. (0583)	→ 76
Energy text (0600)	→ 76
Energy offset (0599)	→ 77
Energy factor (0586)	→ 77
Pressure text (0581)	→ 77
Pressure offset (0580)	→ 78
Pressure factor (0579)	→ 78

Volume text**Navigation**

Expert → Sensor → System units → User-spec. units → Volume text (0567)

Description

Use this function to enter a text for the user-specific unit of volume and volume flow. The corresponding time units (s, min, h, d) for volume flow are generated automatically.

User entry

Max. 10 characters such as letters, numbers or special characters (@, %, /)

Factory setting

User vol.

Additional information*Result*

The defined unit is shown as an option in the choose list of the following parameters:

- **Volume flow unit** parameter (→ 63)
- **Volume unit** parameter (→ 65)

Example

If the text GLAS is entered, the choose list of the **Volume flow unit** parameter (→ 63) shows the following options:

- GLAS/s
- GLAS/min
- GLAS/h
- GLAS/d

Volume offset**Navigation**

Expert → Sensor → System units → User-spec. units → Volume offset (0569)

Description

Use this function to enter the offset for adapting the user-specific volume unit and volume flow unit (without time).

User entry

Signed floating-point number

Factory setting

0

Additional information*Description*

Value in user-specific unit = (factor × value in base unit) + offset

Volume factor**Navigation**

Expert → Sensor → System units → User-spec. units → Volume factor (0568)

Description

Use this function to enter a quantity factor (without time) for the user-specific volume and volume flow unit.

User entry

Signed floating-point number

Factory setting

1.0

Mass text**Navigation**

Expert → Sensor → System units → User-spec. units → Mass text (0560)

Description

Use this function to enter a text for the user-specific unit of mass and mass flow. The corresponding time units (s, min, h, d) for mass flow are generated automatically.

User entry	Max. 10 characters such as letters, numbers or special characters (@, %, /)
Factory setting	User mass
Additional information	<p><i>Result</i></p>  The defined unit is shown as an option in the choose list of the following parameters: <ul style="list-style-type: none"> ▪ Mass flow unit parameter (→ 62) ▪ Mass unit parameter (→ 63)
	<p><i>Example</i></p> <p>If the text CENT for "centner" is entered, the following options are displayed in the picklist for the Mass flow unit parameter (→ 62):</p> <ul style="list-style-type: none"> ▪ CENT/s ▪ CENT/min ▪ CENT/h ▪ CENT/d

Mass offset

Navigation	 Expert → Sensor → System units → User-spec. units → Mass offset (0562)
Description	Use this function to enter the zero point shift for the user-specific mass and mass flow unit.
User entry	Signed floating-point number
Factory setting	0
Additional information	<p><i>Description</i></p>  Value in user-specific unit = (factor × value in base unit) + offset

Mass factor

Navigation	 Expert → Sensor → System units → User-spec. units → Mass factor (0561)
Description	Use this function to enter a quantity factor (without time) for the user-specific mass and mass flow unit.
User entry	Signed floating-point number
Factory setting	1.0
Additional information	<p><i>Example</i></p> <p>Mass of 1 Zentner = 50 kg → 0.02 Zentner = 1 kg → entry: 0.02</p>

Corr. vol. text**Navigation**

Diagram: Expert → Sensor → System units → User-spec. units → Corr. vol. text (0592)

Description

Use this function to enter a text for the user-specific unit of the corrected volume and corrected volume flow. The corresponding time units (s, min, h, d) for mass flow are generated automatically.

User entry

Max. 10 characters such as letters, numbers or special characters (@, %, /)

Factory setting

UserCrVol.

Additional information

Result



The defined unit is shown as an option in the choose list of the following parameters:

- **Cor.volflow unit** parameter (→ [Diagram 66](#))
- **Corr. vol. unit** parameter (→ [Diagram 66](#))

Example

If the text GLAS is entered, the choose list of the **Cor.volflow unit** parameter (→ [Diagram 66](#)) shows the following options:

- GLAS/s
- GLAS/min
- GLAS/h
- GLAS/d

Corr vol. offset**Navigation**

Diagram: Expert → Sensor → System units → User-spec. units → Corr vol. offset (0602)

Description

Use this function to enter the offset for adapting the user-specific corrected volume unit and corrected volume flow unit (without time).



Value in user-specific unit = (factor × value in base unit) + offset

User entry

Signed floating-point number

Factory setting

0

Cor.vol. factor**Navigation**

Diagram: Expert → Sensor → System units → User-spec. units → Cor.vol. factor (0590)

Description

Use this function to enter a quantity factor (without time) for the user-specific corrected volume unit and corrected volume flow unit.

User entry

Signed floating-point number

Factory setting

1.0

Density text

Navigation	Expert → Sensor → System units → User-spec. units → Density text (0570)
Description	Use this function to enter a text or the user-specific unit of density.
User entry	Max. 10 characters such as letters, numbers or special characters (@, %, /)
Factory setting	User dens.
Additional information	<i>Result</i> The defined unit is shown as an option in the choose list of the Density unit parameter (→ 67). <i>Example</i> Enter text “CE_L” for centners per liter

Density offset

Navigation	Expert → Sensor → System units → User-spec. units → Density offset (0571)
Description	Use this function to enter the zero point shift for the user-specific density unit. Value in user-specific unit = (factor × value in base unit) + offset
User entry	Signed floating-point number
Factory setting	0

Density factor

Navigation	Expert → Sensor → System units → User-spec. units → Density factor (0572)
Description	Use this function to enter a quantity factor for the user-specific density unit.
User entry	Signed floating-point number
Factory setting	1.0

Spec. enth. text

Navigation	Expert → Sensor → System units → User-spec. units → Spec. enth. text (0585)
User entry	Max. 10 characters such as letters, numbers or special characters (@, %, /)

Factory setting User enth.

Additional information *Result*

Example

If the text CAL is entered, the choose list of the **Cal. value unit** parameter shows the following options:

- CAL/Nm3
- CAL/m3
- CAL/ft3
- CAL/Sft3

Spec. enth. off.



Navigation Expert → Sensor → System units → User-spec. units → Spec. enth. off. (0584)

Description Use this function to enter the offset for adapting the user-specific calorific value unit (without volume).

User entry Signed floating-point number

Factory setting 0

Spec. enth. fac.



Navigation Expert → Sensor → System units → User-spec. units → Spec. enth. fac. (0583)

Description Use this function to enter a quantity factor (without volume) for the user-specific calorific value unit.

User entry Signed floating-point number

Factory setting 1.0

Additional information *Example*

$1 \text{ W} \times \text{min} = 60 \text{ J} \rightarrow 0.166 \text{ W} \times \text{min} = 1 \text{ J} \rightarrow \text{user entry: } 0.0166$

Energy text



Navigation Expert → Sensor → System units → User-spec. units → Energy text (0600)

Description Use this function to enter a text for the user-specific energy unit.

User entry Max. 10 characters such as letters, numbers or special characters (@, %, /)

Factory setting User en.

Additional information*Result*

The defined unit is shown as an option in the choose list of the following parameters:

- **Energy unit** parameter
- **Energy flow unit** parameter

Example

If the text W is entered, the choose list of the **Energy flow unit** parameter shows the following options:

- W/s
- W/min
- W/h
- W/d

Energy offset**Navigation**

Expert → Sensor → System units → User-spec. units → Energy offset (0599)

Description

Use this function to enter the offset for adapting the user-specific energy unit (without time).

User entry

Signed floating-point number

Factory setting

0

Energy factor**Navigation**

Expert → Sensor → System units → User-spec. units → Energy factor (0586)

Description

Use this function to enter a quantity factor for the user-specific energy unit.

User entry

Signed floating-point number

Factory setting

1.0

Pressure text**Navigation**

Expert → Sensor → System units → User-spec. units → Pressure text (0581)

Description

Use this function to enter a text for the user-specific pressure unit.

User entry

Max. 10 characters such as letters, numbers or special characters (@, %, /)

Factory setting

User pres.

Additional information*Result*

The defined unit is shown as an option in the choose list of the **Pressure unit** parameter (→ 69).

Pressure offset**Navigation**

Expert → Sensor → System units → User-spec. units → Pressure offset (0580)

Description

Use this function to enter the offset for adapting the user-specific pressure unit.

User entry

Signed floating-point number

Factory setting

0

Pressure factor**Navigation**

Expert → Sensor → System units → User-spec. units → Pressure factor (0579)

Description

Use this function to enter a quantity factor for the user-specific pressure unit.

User entry

Signed floating-point number

Factory setting

1.0

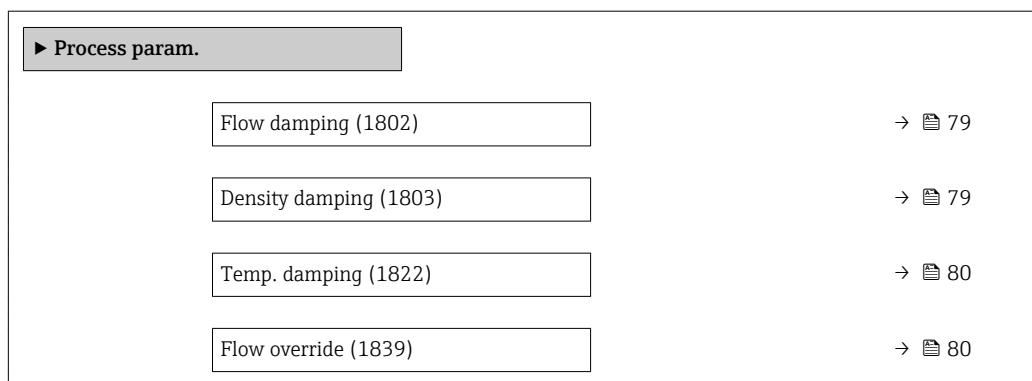
Additional information*Example*

1 Dyn/cm² = 0.1 Pa → 10 Dyn/cm² = 1 Pa → user entry: 10

3.2.3 "Process param." submenu

Navigation

Expert → Sensor → Process param.



▶ Low flow cut off	→  81
▶ Partial pipe det	→  84

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 element²⁾.

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 →  111
- Low flow cut off →  81
- Totalizers →  173

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

2) Proportional behavior with first-order lag

Additional information*Description*

The damping is performed by a PT1 element³⁾.

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.

User entry

0 to 999.9 s

Factory setting

0 s

Additional information*Description*

The damping is performed by a PT1 element⁴⁾.

User entry

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



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

3) Proportional behavior with first-order lag

4) Proportional behavior with first-order lag

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 (→ [110](#)).

"Low flow cut off" submenu*Navigation*

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

► Low flow cut off	
Assign variable (1837)	→ 81
On value (1805)	→ 81
Off value (1804)	→ 82
Pres. shock sup. (1806)	→ 82

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 (→ [81](#)).

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 → [82](#).

User entry Positive floating-point number

Factory setting Depends on country and nominal diameter → [229](#)

Additional information *Dependency*

i The unit depends on the process variable selected in the **Assign variable** parameter (→ [81](#)).

Off value



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

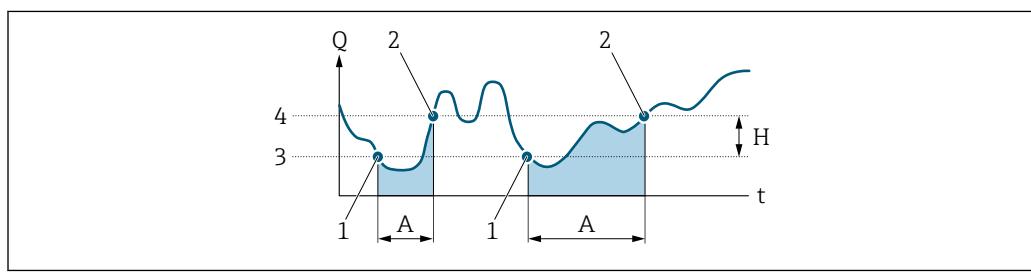
Prerequisite A process variable is selected in the **Assign variable** parameter (→ [81](#)).

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 → [81](#).

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 (→ [81](#)).

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

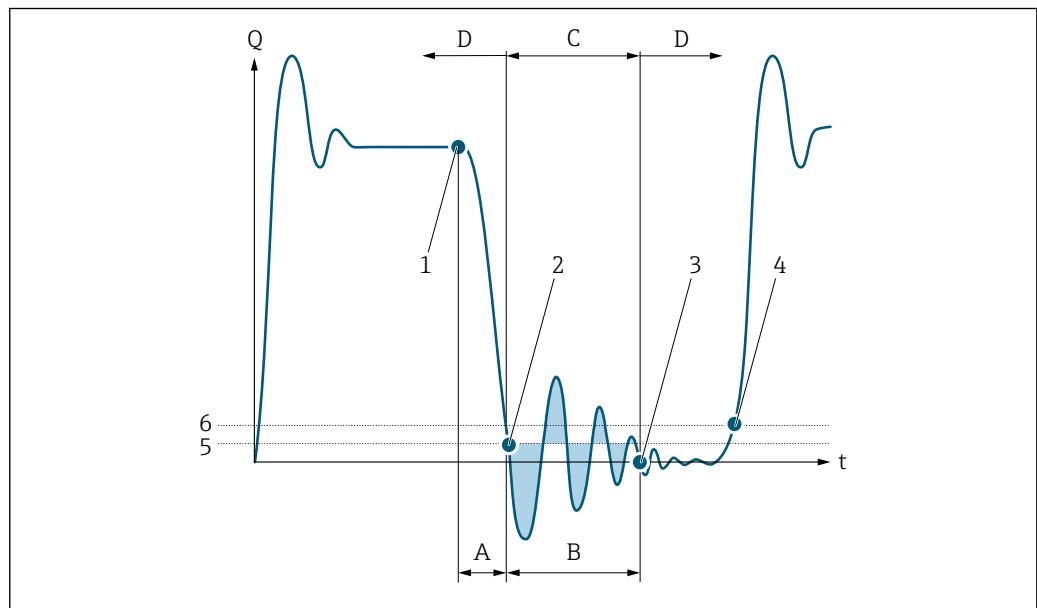
- Prerequisite:
 - Flow rate < on-value of low flow cut off or
 - Changing the flow direction
- Output values
 - Flow displayed: 0
 - Totalizer: the totalizers are pegged at the last correct value

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

- | | |
|----------|--|
| <i>Q</i> | Flow |
| <i>t</i> | 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

 Partial pipe det	
Assign variable (1860)	→  84
Low value (1861)	→  84
High value (1858)	→  85
Response time (1859)	→  85
Max. damping (6040)	→  86

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 (→  84).

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 (→ 85).

 The unit depends on the process variable selected in the **Assign variable** parameter (→ 84).

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 (→ 84).

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 (→ 84).

 The unit depends on the process variable selected in the **Assign variable** parameter (→ 84).

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 (→ 84).

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

► Measurement mode

Select medium (6062)	→ 87
Select gas type (6074)	→ 87
Sound velocity (6147)	→ 88
Temp. coeff. SV (6181)	→ 88

Multi-freq.activ

Navigation	Expert → Sensor → Measurement mode → Multi-freq.activ (6242)
Description	Switching the dual mode of the sensor on and off.
Selection	<ul style="list-style-type: none">■ No■ Yes
Factory setting	No

Select medium

Navigation	Expert → Sensor → Measurement mode → Select medium (6062)
Description	Use this function to select the type of medium.
Selection	Liquid
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 (→ 87).
Description	Use this function to select the type of gas for the measuring application.
Selection	<ul style="list-style-type: none">■ Air■ Ammonia NH3■ Argon Ar■ Sulf. hex.fl.SF6■ Oxygen O2■ Ozone O3■ Nitrog. ox. NOx■ Nitrogen N2■ Nitrous ox. N2O■ Methane CH4■ Hydrogen H2■ Helium He■ Hydrog.chlor.HCl■ Hydrog.sulf. H2S■ Ethylene C2H4■ Carbon diox. CO2■ Carbon monox. CO■ Chlorine Cl2■ Butane C4H10■ Propane C3H8

- Propylene C3H6
- Ethane C2H6
- Others

Factory setting Methane CH4

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 (→ [87](#)), 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 (→ [87](#)).

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

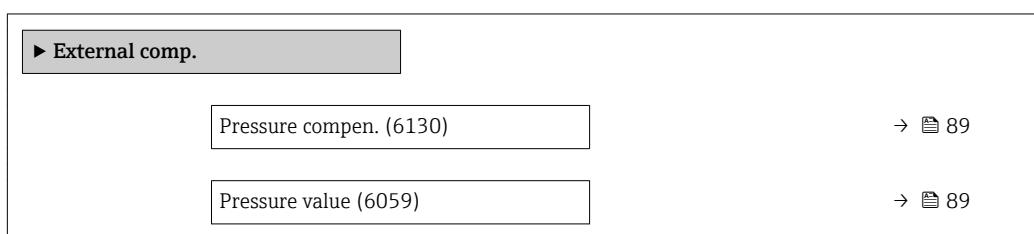
User entry Positive floating-point number

Factory setting 0 (m/s)/K

3.2.5 "External comp." submenu

Navigation

Expert → Sensor → External comp.



External press. (6209)	→ 90
Temp.corr.source (6184)	→ 90
External temp. (6080)	→ 91

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 2 *

Factory setting Off

Additional information *Selection*

- Fixed value
A fixed pressure value is used for compensation: **Pressure value** parameter (→ 89)
- External value
The pressure value read in via EtherNet/IP is used for compensation.
- Current input 1
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 (→ 89).

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

* Visibility depends on order options or device settings

Additional information*User entry*The unit is taken from the **Pressure unit** parameter (→ 69)

External press.

Navigation

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

PrerequisiteThe **Fixed value** option or the **Current input 1...n** option is selected in the **Pressure compen.** parameter (→ 89).**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 (→ 69)

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 *
- Current input 2 *
- Current input 3 *

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.

* Visibility depends on order options or device settings

- 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 EtherNet/IP 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 (→ 90).

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 (→ 69)

Temperature mode


Navigation

Expert → Sensor → External comp. → Temperature mode (6341)

Description

...

Selection

- Internal value
- External value

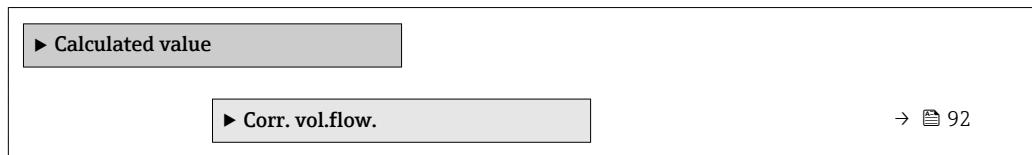
Factory setting

Internal value

3.2.6 "Calculated value" submenu

Navigation

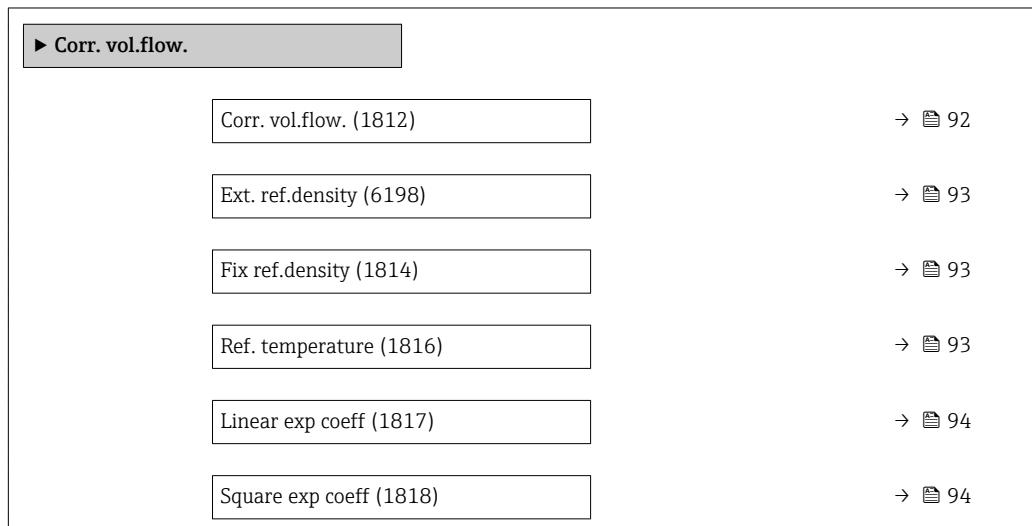
Expert → Sensor → Calculated value



"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 2 *

Factory setting

Calc ref density

Additional information

Selection

The **Ref. dens API 53** option is suitable only for applications involving LPG⁵⁾, 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 → [88](#) → [88](#)) 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

Navigation	  Expert → Sensor → Calculated value → Corr. vol.flow. → Ext. ref.density (6198)
Prerequisite	In the Corr. vol.flow. parameter (→ 92), the Ext. ref.density option is selected.
Description	Displays the reference density which is read in externally, e.g. via the current input.
User interface	Floating point number with sign
Additional information	<i>Dependency</i>
	 The unit is taken from the Ref. dens. unit parameter (→ 68)

Fix ref.density



Navigation	  Expert → Sensor → Calculated value → Corr. vol.flow. → Fix ref.density (1814)
Prerequisite	The Fix ref.density option is selected in the Corr. vol.flow. parameter (→ 92) parameter.
Description	Use this function to enter a fixed value for the reference density.
User entry	Positive floating-point number
Factory setting	1 kg/Nl
Additional information	<i>Dependency</i>
	 The unit is taken from the Ref. dens. unit parameter (→ 68)

Ref. temperature



Navigation	  Expert → Sensor → Calculated value → Corr. vol.flow. → Ref. temperature (1816)
Prerequisite	The Calc ref density option is selected in the Corr. vol.flow. parameter (→ 92) parameter.
Description	Use this function to enter a reference temperature for calculating the reference density.
User entry	-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 (→ 69)

Reference density calculation

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

A0023403

- ρ_n : reference density
- ρ : fluid density currently measured
- t : fluid temperature currently measured
- t_N : reference temperature at which the reference density is calculated (e.g. 20 °C)
- Δt : $t - t_N$
- α : linear expansion coefficient of the fluid, unit = [1/K]; K = Kelvin
- β : square expansion coefficient of the fluid, unit = [1/K²]

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 (→ 92) 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 (→ 92) 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 setting0.0 1/K²

3.2.7 "Sensor adjustment" submenu

Navigation

Expert → Sensor → Sensor adjustm.

▶ Sensor adjustm.	
Install. direct. (1809)	→ 95
Inst. angle roll (6282)	→ 95
Inst.angle pitch (6236)	→ 96
▶ Zero point adj.	→ 96
▶ Variable adjust	→ 97

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.

Inst. angle roll



Navigation

Expert → Sensor → Sensor adjustm. → Inst. angle roll (6282)

Prerequisite

Available only with Promass Q.

Description

Use this function to enter the roll installation angle in degrees.

User entry

-180 to 180 °

Factory setting

0 °

Additional information

FIGURE: ROLL ANGLE

Roll angle

- The roll angle is the angle β from the vertical **V** to align the central axis **Z** of the transmitter.
- The roll angle can be between -180 to $+180$ °.

Inst.angle pitch

Navigation Expert → Sensor → Sensor adjustm. → Inst.angle pitch (6236)

Prerequisite Available only with Promass Q.

Description Use this function to enter the installation angle pitch in degrees.

User entry -180 to 180 °

Factory setting 0 °

Additional information **FIGURE: PITCH ANGLE**

Pitch angle

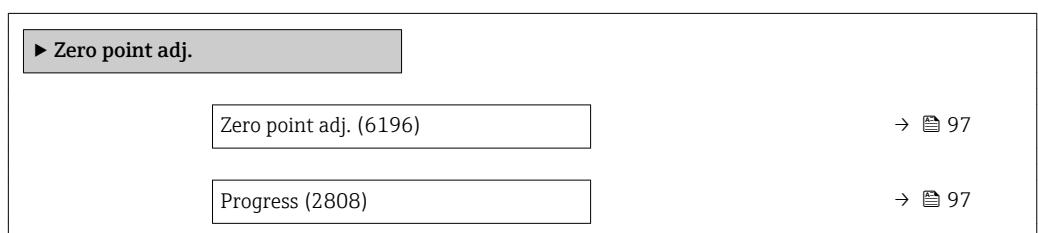
- The pitch angle is the angle α from the horizontal **H** to align the central axis **Z** of the measuring device.
- The pitch angle can be between -90 to $+90$ °.

"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.**Navigation**

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 → 96.

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 %

"Variable adjust" submenu*Navigation*

Expert → Sensor → Sensor adjustm. → Variable adjust

▶ Variable adjust	
Mass flow offset (1831)	→ 98
Mass flow factor (1832)	→ 98
Vol. flow offset (1841)	→ 99
Vol. flow factor (1846)	→ 99

Density offset (1848)	→ 99
Density factor (1849)	→ 100
Corr. vol offset (1866)	→ 100
Corr. vol factor (1867)	→ 100
Ref.dens. offset (1868)	→ 101
Ref.dens. factor (1869)	→ 101
Temp. offset (1870)	→ 101
Temp. factor (1871)	→ 102

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

**Navigation**

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

Description

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

User entry

Positive floating-point number

Factory setting

1

Additional information*Description*

Corrected value = (factor × value) + offset

Vol. flow offset

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

Description Use this function to enter the zero point shift for the volume flow trim. The volume flow unit on which the shift is based is m³/s.

User entry Signed floating-point number

Factory setting 0 m³/s

Additional information *Description*

Corrected value = (factor × value) + offset

Vol. flow factor

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

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

User entry Positive floating-point number

Factory setting 1

Additional information *Description*

Corrected value = (factor × value) + offset

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/m³.

User entry Signed floating-point number

Factory setting 0 kg/m³

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 Nm³/s.

User entry Signed floating-point number

Factory setting 0 Nm³/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 ³ .
User entry	Signed floating-point number
Factory setting	0 kg/Nm ³
Additional information	<i>Description</i> 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	<i>Description</i> 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	<i>Description</i> 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

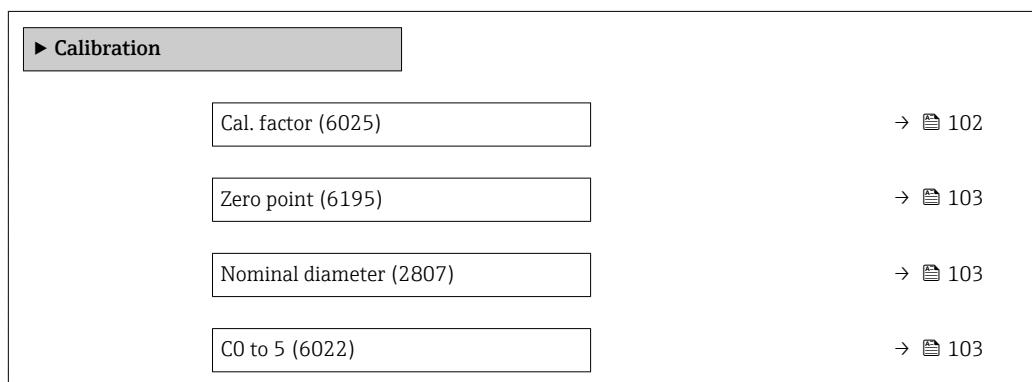
Factory setting 1

Additional information *Description*

Corrected value = (factor × value) + offset

3.2.8 "Calibration" submenu

Navigation Expert → Sensor → Calibration

**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 config.

I/O 1 to n terminals (3902-1 to n)

→ 104

I/O 1 to n info (3906-1 to n)

→ 104

I/O 1 to n type (3901-1 to n)	→ 105
Apply I/O config (3907)	→ 105
Alteration code (2762)	→ 105

I/O 1 to n terminals

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

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

User interface

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

I/O 1 to n info

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

Description Displays information about the plugged in I/O module.

User interface

- Not plugged
- Invalid
- Not configurable
- Configurable
- EtherNet/IP

Additional information

"Not plugged" option
The I/O module is not plugged in.

"Invalid" option
The I/O module is not plugged correctly.

"Not configurable" option
The I/O module is not configurable.

"Configurable" option
The I/O module is configurable.

"Fieldbus" option
The I/O module is configured for the fieldbus.

I/O 1 to n type**Navigation**

Expert → I/O config. → I/O 1 to n type (3901-1 to n)

Prerequisite

For the following order code:
"Output; input 2", option **D** "Configurable I/O initial setting off"

Description

Use this function to select the I/O module type for the configuration of the I/O module.

Selection

- Off
- Curr.output *
- Current input *
- Status input *
- PFS output *

Factory setting

Off

Apply I/O config**Navigation**

Expert → I/O config. → Apply I/O config (3907)

Description

Use this function to activate the newly configured I/O module type.

Selection

- No
- Yes

Factory setting

No

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*

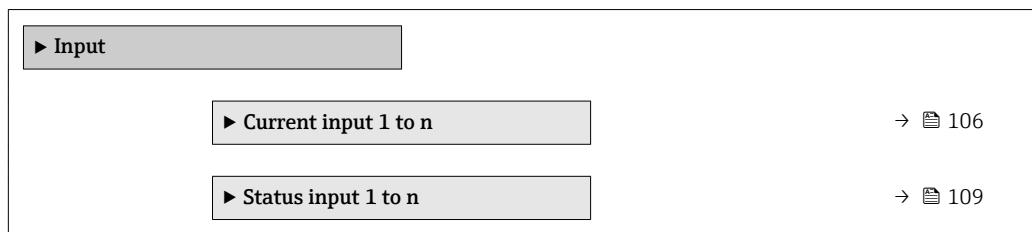
The I/O configuration is changed in the **I/O type** parameter (→ [105](#)).

* Visibility depends on order options or device settings

3.4 "Input" submenu

Navigation

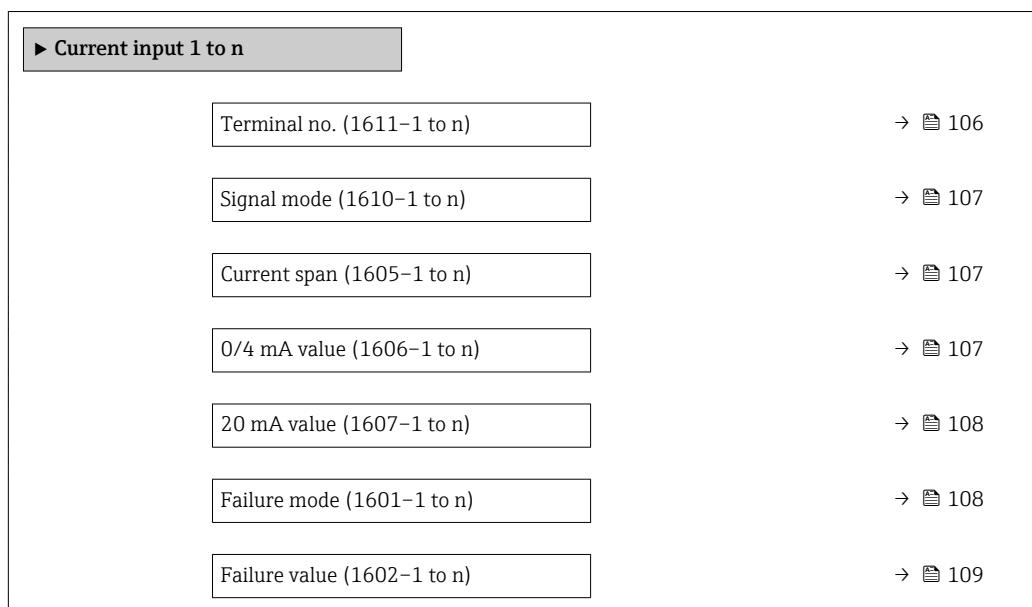
Expert → Input



3.4.1 "Current input 1 to n" submenu

Navigation

Expert → Input → Current input 1 to n



Terminal no.

Navigation

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

Description

Displays the terminal numbers used by the current input module.

User interface

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

Additional information

'Not used' option

The current input module does not use any terminal numbers.

Signal mode

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

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

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

Selection

- Passive
- Active

Factory setting Active

Current span

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

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

Selection

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

Factory setting Country-specific:
■ 4...20 mA NAMUR
■ 4...20 mA US

Additional information *Examples*



Sample values for the current range: **Current span** parameter (→ 114)

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 (→ [107](#))
- Failure mode (→ [108](#))

Configuration examples

 Pay attention to the configuration examples for **4 mA value** parameter (→ [115](#)).

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 (→ [115](#)).

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 (→ [107](#)).

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 (→ [109](#))).

Failure value

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

Prerequisite In the **Failure mode** parameter (→ [108](#)), 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)	→ 109
Assign stat.inp. (1352–1 to n)	→ 110
Val.stat.inp. (1353–1 to n)	→ 110
Active level (1351–1 to n)	→ 110
Response time (1354–1 to n)	→ 111

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

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

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

- Off
- Reset totaliz. 1
- Reset totaliz. 2
- Reset totaliz. 3
- Reset all tot.
- Flow override

Factory setting

Off

Additional information*Selection*

- Off
The status input is switched off.
- Reset totaliz. 1...3
The individual totalizers are reset.
- Reset all tot.
All totalizers are reset.
- Flow override
The Flow override (→ 80) is activated.

Note on the Flow override (→ 80):

- The Flow override (→ 80) 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

- High
- Low

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)

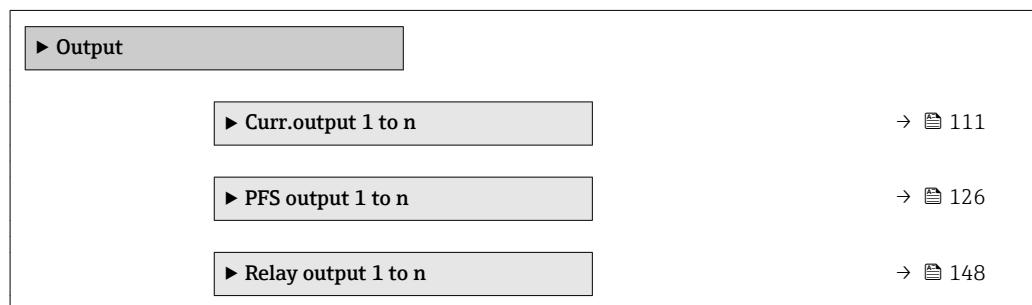
Description Use this function to enter the minimum time period for which the input signal level must be present before the selected function is activated.

User entry 5 to 200 ms

Factory setting 50 ms

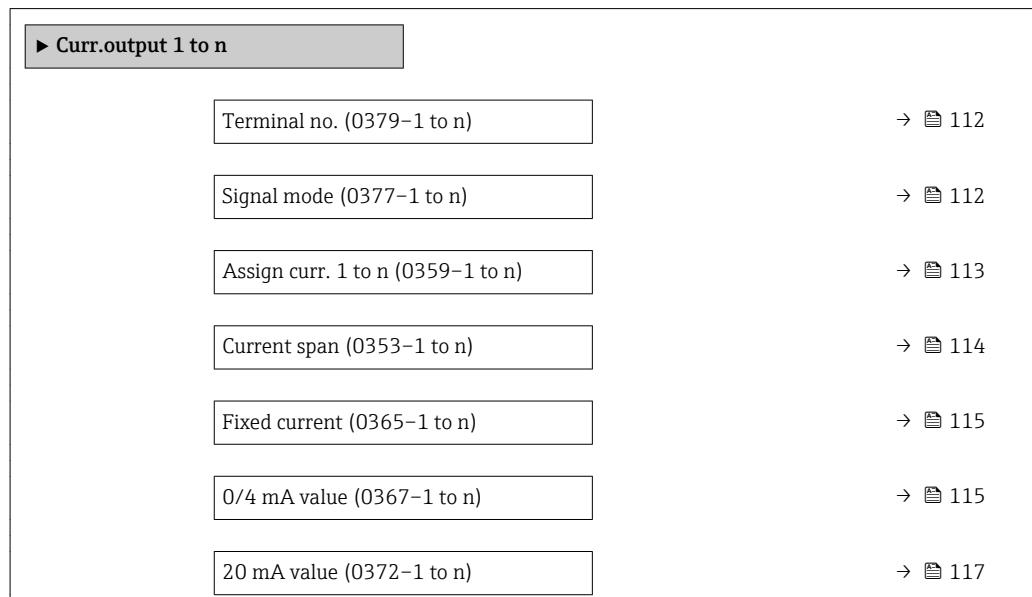
3.5 "Output" submenu

Navigation Expert → Output



3.5.1 "Current output 1 to n" submenu

Navigation Expert → Output → Curr.output 1 to n



Measuring mode (0351-1 to n)	→ 118
Damping out. 1 to n (0363-1 to n)	→ 123
Response time (0378-1 to n)	→ 123
Failure mode (0364-1 to n)	→ 124
Failure current (0352-1 to n)	→ 125
Output curr. 1 to n (0361-1 to n)	→ 126
Measur. curr. 1 to n (0366-1 to n)	→ 126

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)
- 22-23 (I/O 3)

Additional information

"Not used" option

The current output module does not use any terminal numbers.

Signal mode

Navigation Expert → Output → Curr.output 1 to n → Signal mode (0377-1 to n)

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

Selection

- Passive
- Active

Factory setting

Active

Assign curr. 1 to n**Navigation**

Expert → Output → Curr.output 1 to n → Assign curr. 1 to n (0359–1 to n)

Description

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

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

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 *
- Dynam. viscosity *
- Kinematic visc.
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0

* Visibility depends on order options or device settings

- Exc. current 1 *
- HBSI *
- Pressure

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 (→ [124](#)).
- 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 (→ [115](#)) and **20 mA value** parameter (→ [117](#)).

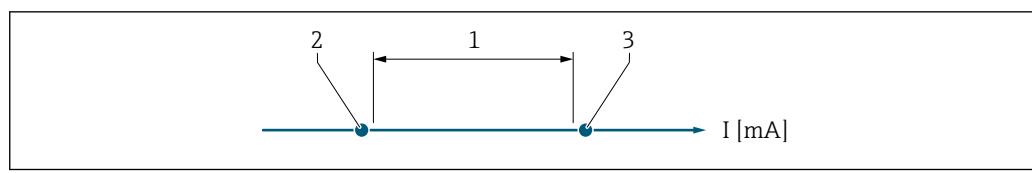
"Fixed current" option

The current value is set via the **Fixed current** parameter (→ [115](#)).

Example

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

* Visibility depends on order options or device settings



- 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
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 (→ [114](#)).

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 (→ [114](#)):

- 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 (→ 113). 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 (→ 117).

Dependency

i The unit depends on the process variable selected in the **Assign curr.** parameter (→ 113).

Current output behavior

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

- Current span (→ 114)
- Failure mode (→ 124)

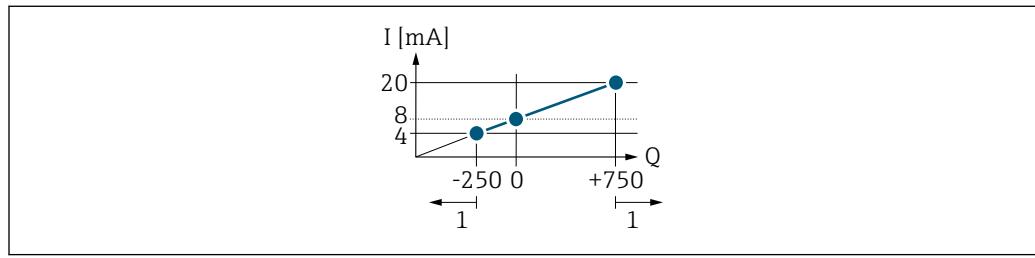
Configuration examples

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 (→ 115) = not equal to zero flow (e.g. -250 m³/h)
- **20 mA value** parameter (→ 117) = not equal to zero flow (e.g. +750 m³/h)
- Calculated current value = 8 mA at zero flow



Q Flow

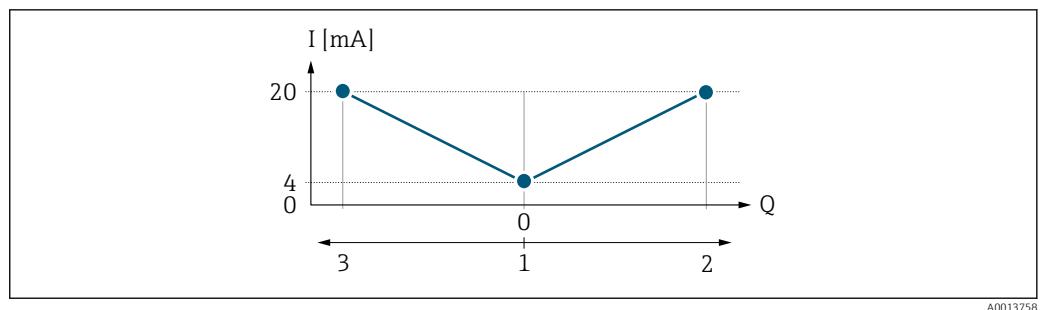
I Current

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 (→ 115) and **20 mA value** parameter (→ 117). 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 (→ 115) and **20 mA value** parameter (→ 117) must have the same sign. The value for the **20 mA value** parameter (→ 117) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (→ 117) (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 → 118.

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 (→ 114): <ul style="list-style-type: none"> ■ 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 → 228
Additional information	<i>Description</i> Positive and negative values are permitted depending on the process variable assigned in the Assign curr. parameter (→ 113). 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 (→ [115](#)).

Dependency

 The unit depends on the process variable selected in the **Assign curr.** parameter (→ [113](#)).

Example

- Value assigned to 0/4 mA = -250 m³/h
- Value assigned to 20 mA = +750 m³/h
- Calculated current value = 8 mA (at zero flow)

If the **Forward/Reverse** option is selected in the **Measuring mode** parameter (→ [118](#)), different signs cannot be entered for the values of the **0/4 mA value** parameter (→ [115](#)) and **20 mA value** parameter (→ [117](#)). The diagnostic message **△S441 Curr.output 1 to n** is displayed.

Configuration examples

 Observe the configuration examples for the **0/4 mA value** parameter (→ [115](#)).

Measuring mode



Navigation

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

Prerequisite

In the **Assign curr.** parameter (→ [113](#)), one of the following options is selected:

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc.
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry

* Visibility depends on order options or device settings

- Exc. current 0 *
- Exc. current 1 *
- HBSI *

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

In the **Current span** parameter (\rightarrow 114), 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

i The process variable that is assigned to the current output via the **Assign curr.** parameter (\rightarrow 113) is displayed below the parameter.

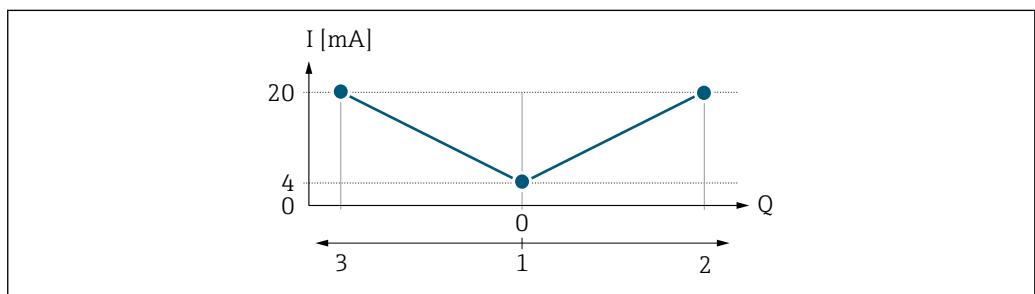
"Forward flow" option

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.

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



A0013758

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

* Visibility depends on order options or device settings

- 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 (→ 115) and **20 mA value** parameter (→ 117) must have the same sign.
- The value for the **20 mA value** parameter (→ 117) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (→ 117) (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.

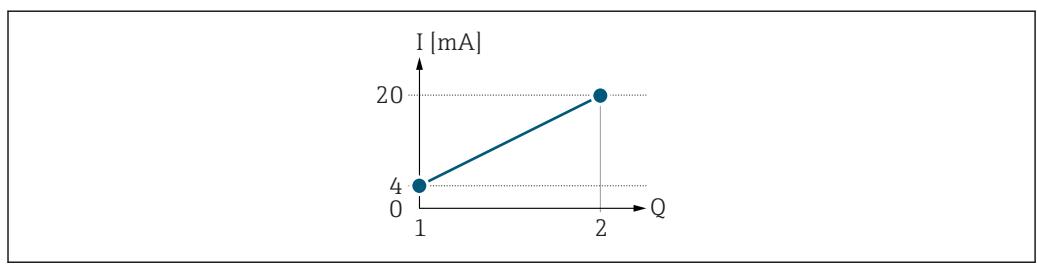
Flow values can aggregate in the buffer in the event of prolonged and unwanted fluid reverse flow. However, these flows are not taken into consideration by the current output configuration, i.e. the reverse flow is not compensated.

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



■ 2 Measuring range

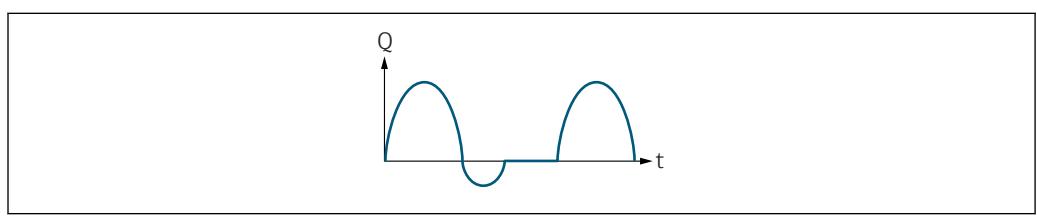
I Current

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:



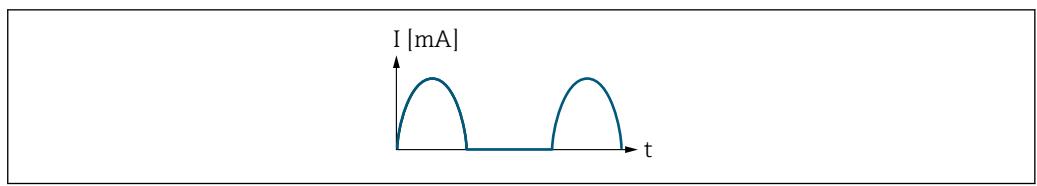
■ 3 Flow response

Q Flow

t Time

With **Forward flow** option

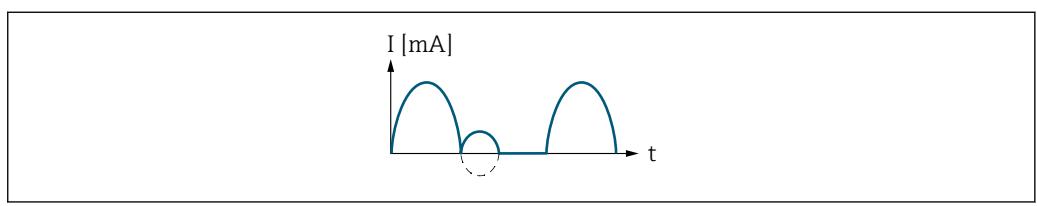
The current output signal is proportional to the process variable assigned. The flow components outside the scaled measuring range are not taken into account for signal output:



I Current
t Time

With Forward/Reverse option

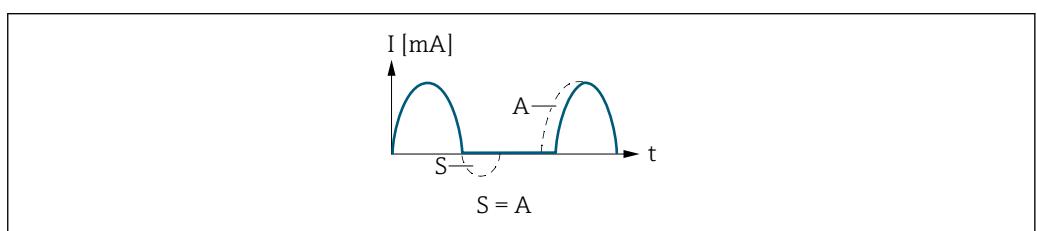
The current output signal is independent of the direction of flow.



I Current
t Time

With Rev. flow comp. option

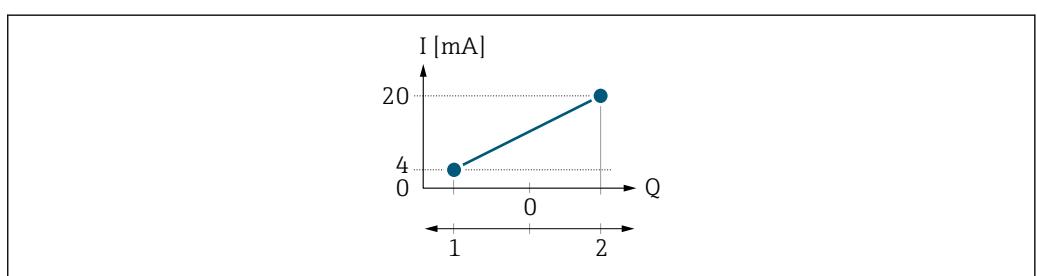
Flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.



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

Example 2

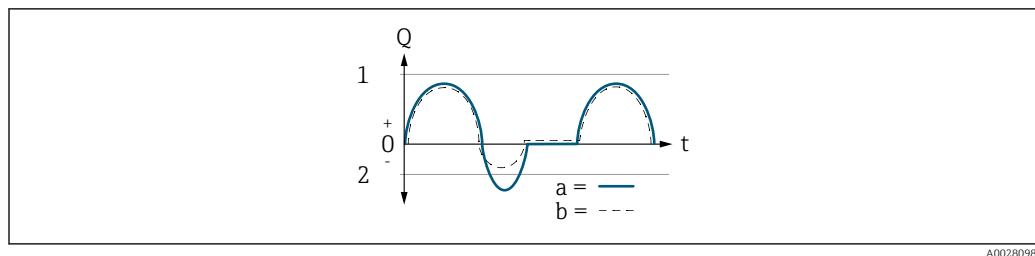
Defined measuring range: lower range value and upper range value with **different** signs



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)

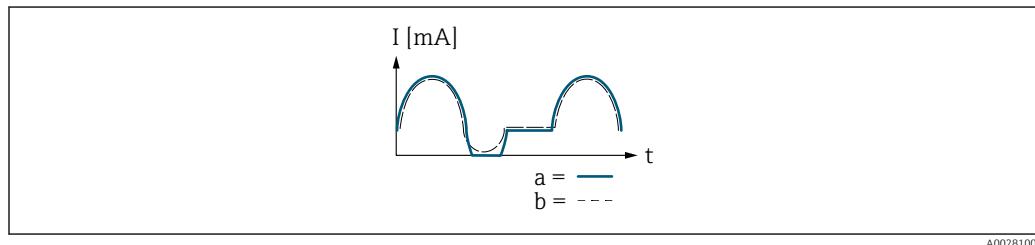
With flow a (—) outside, b (- -) inside the measuring range



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.



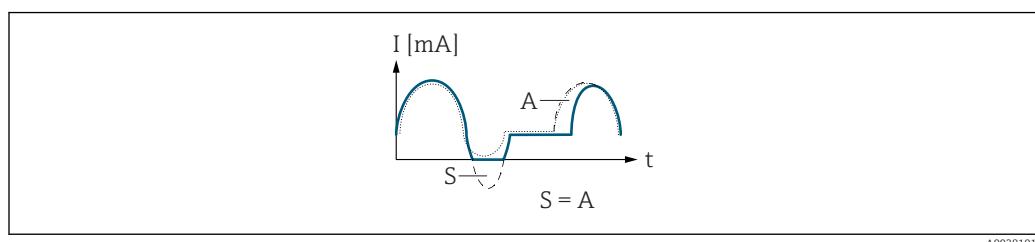
I Current
 t Time

With **Forward/Reverse** option

This option is not possible in this case as the values for the **0/4 mA value** parameter (→ 115) and **20 mA value** parameter (→ 117) 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

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 (→ [113](#)) and one of the following options is selected in the **Current span** parameter (→ [114](#)):

- 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 element⁶⁾) for current output damping:

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



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

Response time**Navigation**

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

Prerequisite

One of the following options is selected in the **Assign curr.** parameter (→ [113](#)):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl.*
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc.*
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp.*
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *

6) proportional transmission behavior with first order delay
* Visibility depends on order options or device settings

- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *
- HBSI *

 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 (→ 114):

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

Description

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

User interface

Positive floating-point number

Additional information

Description

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

- Current output damping → 123
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 (→ 113) and one of the following options is selected in the **Current span** parameter (→ 114):

- 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.

* Visibility depends on order options or device settings

Selection	<ul style="list-style-type: none"> ■ Min. ■ Max. ■ Last valid value ■ Actual value ■ Defined value
Factory setting	Max.
Additional information	<p><i>Description</i></p> <p> This setting does not affect the failsafe mode of other outputs and totalizers. This is specified in separate parameters.</p> <p><i>"Min." option</i> The current output adopts the value of the lower level for signal on alarm.</p> <p> The signal on alarm level is defined via the Current span parameter (→ 114).</p> <p><i>"Max." option</i> The current output adopts the value of the upper level for signal on alarm.</p> <p> The signal on alarm level is defined via the Current span parameter (→ 114).</p> <p><i>"Last valid value" option</i> The current output adopts the last measured value that was valid before the device alarm occurred.</p> <p><i>"Actual value" option</i> The current output adopts the measured value on the basis of the current flow measurement; the device alarm is ignored.</p> <p><i>"Defined value" option</i> The current output adopts a defined measured value.</p> <p> The measured value is defined via the Failure current parameter (→ 125).</p>

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 (→ 124).
Description	Use this function to enter a fixed value that the current output adopts in the event of a device alarm.
User entry	0 to 22.5 mA
Factory setting	22.5 mA

Output curr. 1 to n

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

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

User interface 3.59 to 22.5 mA

Measur. curr. 1 to n

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

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

User interface 0 to 30 mA

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

Navigation  Expert → Output → PFS output 1 to n

 PFS output 1 to n	
Terminal no. (0492–1 to n)	→  127
Signal mode (0490–1 to n)	→  128
Operating mode (0469–1 to n)	→  128
Assign pulse 1 to n (0460–1 to n)	→  130
Value per pulse (0455–1 to n)	→  130
Pulse width (0452–1 to n)	→  131
Measuring mode (0457–1 to n)	→  132
Failure mode (0480–1 to n)	→  132
Pulse output 1 to n (0456–1 to n)	→  133
Assign freq. (0478–1 to n)	→  134
Min. freq. value (0453–1 to n)	→  135

Max. freq. value (0454-1 to n)	→ 135
Val. at min.freq (0476-1 to n)	→ 135
Val. at max.freq (0475-1 to n)	→ 136
Measuring mode (0479-1 to n)	→ 136
Damping out. 1 to n (0477-1 to n)	→ 137
Response time (0491-1 to n)	→ 138
Failure mode (0451-1 to n)	→ 139
Failure freq. (0474-1 to n)	→ 140
Output freq. 1 to n (0471-1 to n)	→ 140
Switch out funct (0481-1 to n)	→ 141
Assign diag. beh (0482-1 to n)	→ 141
Assign limit (0483-1 to n)	→ 142
Switch-on value (0466-1 to n)	→ 144
Switch-off value (0464-1 to n)	→ 144
Assign dir.check (0484-1 to n)	→ 145
Assign status (0485-1 to n)	→ 145
Switch-on delay (0467-1 to n)	→ 146
Switch-off delay (0465-1 to n)	→ 146
Failure mode (0486-1 to n)	→ 146
Switch status 1 to n (0461-1 to n)	→ 147
Invert outp.sig. (0470-1 to n)	→ 147

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)
- 22-23 (I/O 3)

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

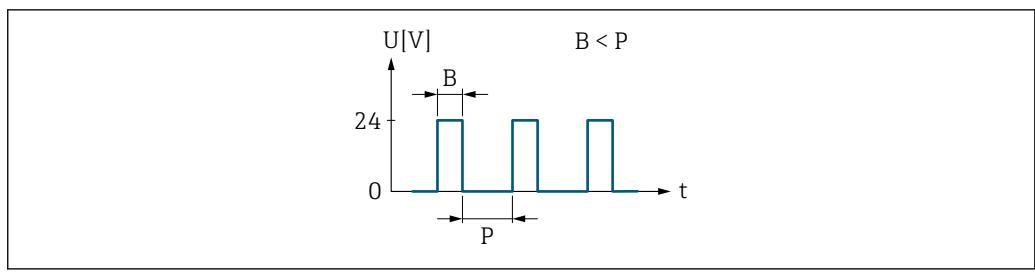
"Pulse" option

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

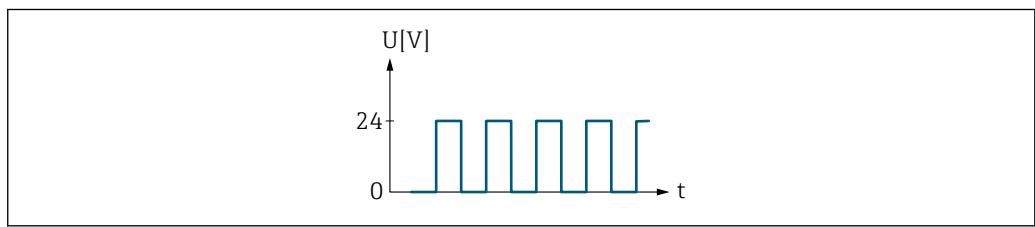
"Frequency" option

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, dynamic viscosity, kinematic viscosity, temperature-compensated dynamic viscosity, temperature-compensated kinematic viscosity, 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 1 000 g/s
- Output frequency approx. 1 000 Hz



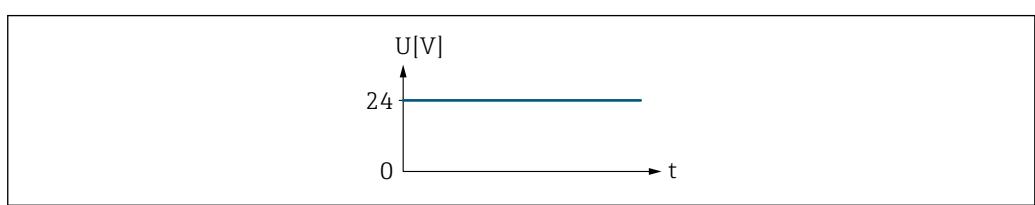
■ 6 Flow-proportional frequency output

"Switch" option

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

Example

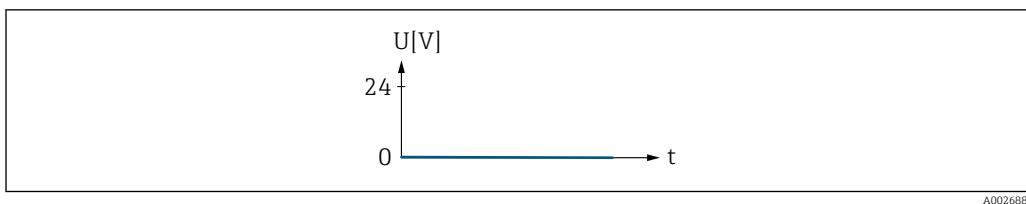
Alarm response without alarm



■ 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 (→ 128) 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 *
- GSV flow
- GSVA *
- NSV flow *
- NSVA *
- S&W volume flow *
- Oil mass flow *
- Water mass flow *
- Oil volume flow *
- Water vol. flow *
- Oil corr.vol.fl. *
- Water corr.v.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 (→ 128) and a process variable is selected in the **Assign pulse** parameter (→ 130).

Description

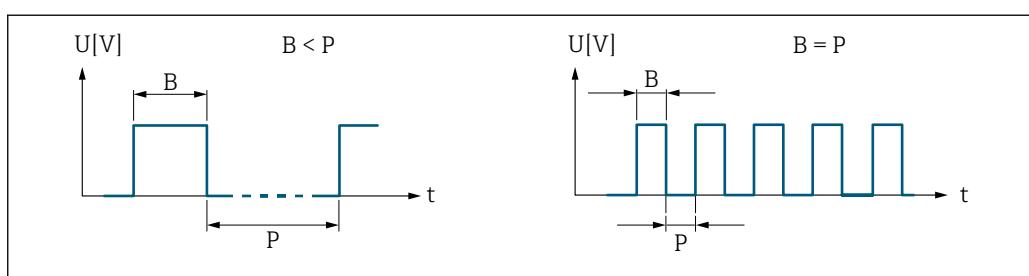
Use this function to enter the value for the measured value that a pulse is equivalent to.

* Visibility depends on order options or device settings

User entry	Signed floating-point number
Factory setting	Depends on country and nominal diameter → 229
Additional information	<p><i>User entry</i></p> <p>Weighting of the pulse output with a quantity.</p> <p>The lower the pulse value, the</p> <ul style="list-style-type: none"> ▪ better the resolution. ▪ the higher the frequency of the pulse response.

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 (→ 128) and a process variable is selected in the Assign pulse parameter (→ 130).
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	<p><i>Description</i></p> <ul style="list-style-type: none"> ▪ 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 (→ 128), the **Pulse** option is selected, and one of the following options is selected in the **Assign pulse** parameter (→ 130):

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

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 (→ 118)

Examples

For a detailed description of the configuration examples, see the **Measuring mode** parameter (→ 118)

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 (→ 128) and a process variable is selected in the **Assign pulse** parameter (→ 130).

Description

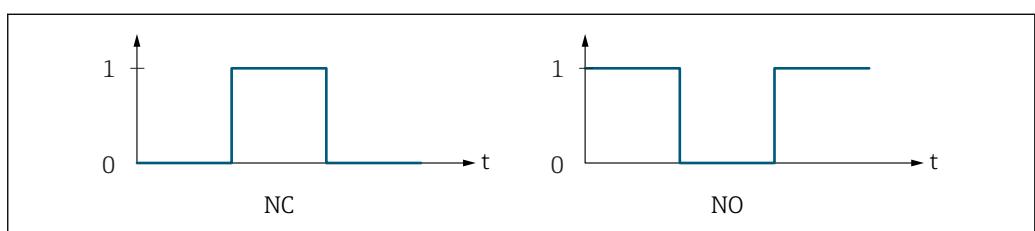
Use this function to select the failure mode of the pulse output in the event of a device alarm.

* Visibility depends on order options or device settings

Selection	<ul style="list-style-type: none"> ▪ Actual value ▪ No pulses
Factory setting	No pulses
Additional information	<p><i>Description</i></p> <p>The dictates of safety render it advisable to ensure that the pulse output shows a predefined behavior in the event of a device alarm.</p> <p><i>Selection</i></p> <ul style="list-style-type: none"> ▪ 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". <p>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.</p>

Pulse output 1 to n

Navigation	Expert → Output → PFS output 1 to n → Pulse output 1 to n (0456–1 to n)
Prerequisite	The Pulse option is selected in the Operating mode parameter (→ 128) parameter.
Description	Displays the pulse frequency currently output.
User interface	Positive floating-point number
Additional information	<p><i>Description</i></p> <ul style="list-style-type: none"> ▪ The pulse output is an open collector output. ▪ This is configured at the factory in such a way that the transistor is conductive for the duration of the pulse (NO contact) and is safety-oriented.



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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 (→ 147) 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 (→ 132)) can be configured.

Assign freq.**Navigation**

Expert → Output → PFS output 1 to n → Assign freq. (0478-1 to n)

Prerequisite

The **Frequency** option is selected in the **Operating mode** parameter (→ 128) parameter.

Description

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

 Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry: Value 1 display** parameter (→ 18)**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 ^{*}
- Dynam. viscosity ^{*}
- Kinematic visc.
- TempCompDynVisc ^{*}
- TempCompKinVisc ^{*}
- Temperature
- Carr. pipe temp. ^{*}
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 ^{*}
- Osc. ampl. 0 ^{*}
- Osc. ampl. 1 ^{*}
- Freq. fluct. 0
- Freq. fluct. 1 ^{*}
- Osc. damping 0
- Osc. damping 1 ^{*}

* Visibility depends on order options or device settings

- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *
- 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 (→ [128](#)) and a process variable is selected in the **Assign freq.** parameter (→ [134](#)).

Description Use this function to enter the start value frequency.

User entry 0.0 to 10 000.0 Hz

Factory setting 0.0 Hz

Max. freq. value



Navigation Expert → Output → PFS output 1 to n → Max. freq. value (0454–1 to n)

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (→ [128](#)) and a process variable is selected in the **Assign freq.** parameter (→ [134](#)).

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 (→ [128](#)) and a process variable is selected in the **Assign freq.** parameter (→ [134](#)).

Description Use this function to enter the measured value for the start value frequency.

* Visibility depends on order options or device settings

User entry	Signed floating-point number
Factory setting	Depends on country and nominal diameter
Additional information	<p><i>Dependency</i></p> <p> The entry depends on the process variable selected in the Assign freq. parameter (→ 134).</p>

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 (→ 128) and a process variable is selected in the Assign freq. parameter (→ 134).
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	<p><i>Description</i></p> <p>Use this function to enter the maximum measured value at the maximum frequency. The selected process variable is output as a proportional frequency.</p> <p><i>Dependency</i></p> <p> The entry depends on the process variable selected in the Assign freq. parameter (→ 134).</p>

Measuring mode

Navigation	 Expert → Output → PFS output 1 to n → Measuring mode (0479-1 to n)
Prerequisite	In the Operating mode parameter (→ 128), the Frequency option is selected, and one of the following options is selected in the Assign freq. parameter (→ 134): <ul style="list-style-type: none"> ▪ Mass flow ▪ Volume flow ▪ Correct.vol.flow ▪ Target mass flow * ▪ Carrier mass fl. * ▪ Density ▪ Ref.density ▪ Concentration * ▪ Dynam. viscosity * ▪ Kinematic visc. ▪ TempCompDynVisc * ▪ TempCompKinVisc *

* Visibility depends on order options or device settings

- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0 *
- Osc. freq. 1 *
- Freq. fluct. 0 *
- Freq. fluct. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Osc. damping 0 *
- Osc. damping 1 *
- Osc.damp.fluct 0 *
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0 *
- Exc. current 1 *

 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 (→ 118)

Examples

 For a detailed description of the configuration examples, see the **Measuring mode** parameter (→ 118)

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 (→ 128), the **Frequency** option is selected, and one of the following options is selected in the **Assign freq.** parameter (→ 134):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc.

* Visibility depends on order options or device settings

- TempCompDynVisc^{*}
- TempCompKinVisc^{*}
- Temperature
- Carr. pipe temp.^{*}
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1^{*}
- Freq. fluct. 0
- Freq. fluct. 1^{*}
- Osc. ampl. 0^{*}
- Osc. ampl. 1^{*}
- Osc. damping 0
- Osc. damping 1^{*}
- Osc.damp.fluct 0
- Osc.damp.fluct 1^{*}
- Signal asymmetry
- Exc. current 0
- Exc. current 1^{*}

i 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 element⁷⁾) 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.

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

The frequency output is subject to separate damping that is independent of all preceding time constants.

Response time

Navigation

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

Prerequisite

In the **Operating mode** parameter (→ 128), the **Frequency** option is selected, and one of the following options is selected in the **Assign freq.** parameter (→ 134):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow^{*}
- Carrier mass fl.^{*}

* Visibility depends on order options or device settings

7) proportional transmission behavior with first order delay

- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc.
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *

 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 → [123](#) 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 (→ [128](#)) and a process variable is selected in the **Assign freq.** parameter (→ [134](#)).

Description Use this function to select the failure mode of the frequency output in the event of a device alarm.

* Visibility depends on order options or device settings

Selection	<ul style="list-style-type: none"> ▪ Actual value ▪ Defined value ▪ 0 Hz
Factory setting	0 Hz
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ▪ Actual value In the event of a device alarm, the frequency output continues on the basis of the current flow measurement. The device alarm is ignored. ▪ Defined value In the event of a device alarm, the frequency output continues on the basis of a predefined value. The Failure freq. (→ 140) replaces the current measured value, making it possible to bypass the device alarm. The actual measurement is switched off for the duration of the device alarm. ▪ 0 Hz In the event of a device alarm, the frequency output is "switched off". <p>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.</p>

Failure freq.

Navigation	Expert → Output → PFS output 1 to n → Failure freq. (0474–1 to n)
Prerequisite	The Frequency option is selected in the Operating mode parameter (→ 128) and a process variable is selected in the Assign freq. parameter (→ 134).
Description	Use this function to enter the value for the frequency output in the event of a device alarm in order to bypass the alarm.
User entry	0.0 to 12 500.0 Hz
Factory setting	0.0 Hz

Output freq. 1 to n

Navigation	Expert → Output → PFS output 1 to n → Output freq. 1 to n (0471–1 to n)
Prerequisite	In the Operating mode parameter (→ 128), the Frequency option is selected.
Description	Displays the actual value of the output frequency which is currently measured.
User interface	0.0 to 12 500.0 Hz

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 (→ 128).

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 (→ 128), the **Switch** option is selected.
- In the **Switch out funct** parameter (→ 141), 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 (→ 128)
- The **Limit** option is selected in the **Switch out funct** parameter (→ 141)

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.
- Dynam. viscosity *
- Concentration *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *

* Visibility depends on order options or device settings

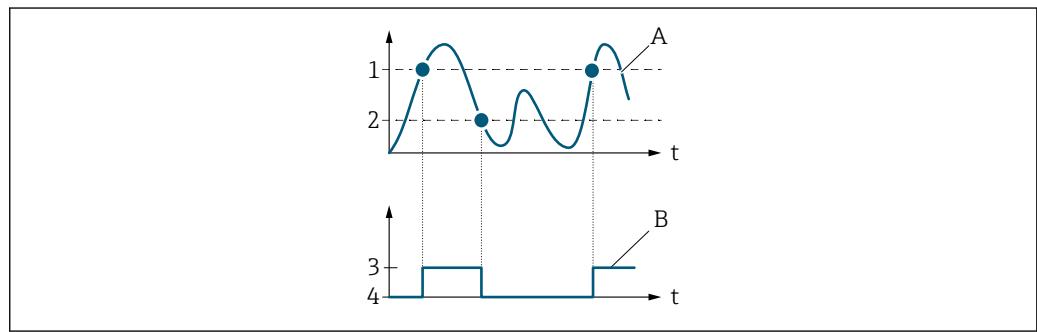
- Temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Oscil. damping
- Pressure

Factory setting Mass flow

Additional information *Description*

Behavior of status output when Switch-on value > Switch-off value:

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

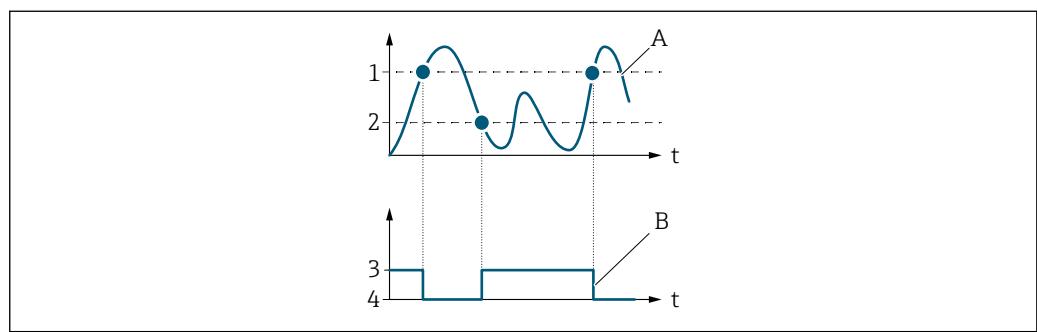


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- 1 Switch-on value
- 2 Switch-off value
- 3 Conductive
- 4 Non-conductive
- A Process variable
- B Status output

Behavior of status output when Switch-on value < Switch-off value:

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

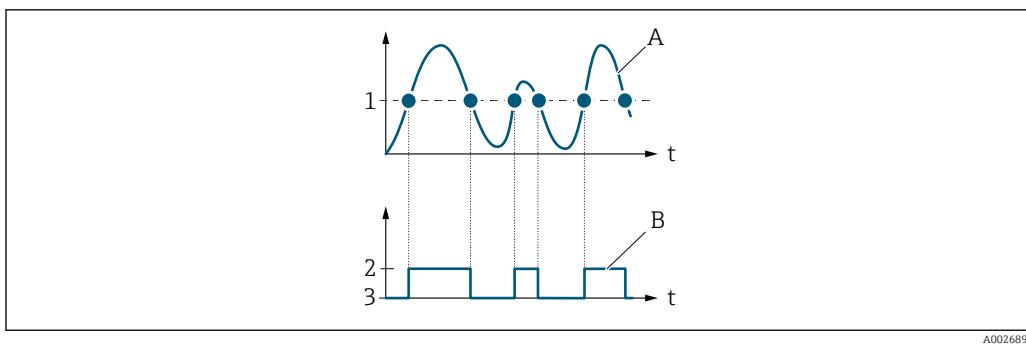


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- 1 Switch-off value
- 2 Switch-on value
- 3 Conductive
- 4 Non-conductive
- A Process variable
- B Status output

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 (→ 128), the **Switch** option is selected.
- In the **Switch out funct** parameter (→ 141), 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 (→ 142).

Switch-off value



Navigation

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

Prerequisite

- In the **Operating mode** parameter (→ 128), the **Switch** option is selected.
- In the **Switch out funct** parameter (→ 141), the **Limit** option is selected.

Description

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

User entry	Signed floating-point number
Factory setting	Country-specific: ■ 0 kg/h ■ 0 lb/min
Additional information	<p><i>Description</i></p> <p>Use this function to enter the limit value for the switch-off value (process variable < switch-off value = open, non-conductive).</p> <p> When using a hysteresis: Switch-on value > Switch-off value.</p> <p><i>Dependency</i></p> <p> The unit depends on the process variable selected in the Assign limit parameter (→ 142).</p>

Assign dir.check

Navigation	 Expert → Output → PFS output 1 to n → Assign dir.check (0484-1 to n)
Prerequisite	<ul style="list-style-type: none"> ■ The Switch option is selected in the Operating mode parameter (→ 128). ■ The Fl. direct.check option is selected in the Switch out funct parameter (→ 141).
Description	Use this function to select a process variable for monitoring the flow direction.
Selection	<ul style="list-style-type: none"> ■ Off ■ Volume flow ■ Mass flow ■ Correct.vol.flow
Factory setting	Mass flow

Assign status

Navigation	 Expert → Output → PFS output 1 to n → Assign status (0485-1 to n)
Prerequisite	<ul style="list-style-type: none"> ■ The Switch option is selected in the Operating mode parameter (→ 128). ■ The Status option is selected in the Switch out funct parameter (→ 141).
Description	Use this function to select a device status for the switch output.
Selection	<ul style="list-style-type: none"> ■ Partial pipe det ■ Low flow cut off
Factory setting	Partial pipe det
Additional information	<p><i>Options</i></p> <p>If empty pipe detection or low flow cut off are enabled, the output is conductive. Otherwise, the switch output is non-conductive.</p>

Switch-on delay



Navigation Expert → Output → PFS output 1 to n → Switch-on delay (0467-1 to n)

Prerequisite

- The **Switch** option is selected in the **Operating mode** parameter (→ 128).
- The **Limit** option is selected in the **Switch out funct** parameter (→ 141).

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

User entry 0.0 to 100.0 s

Factory setting 0.0 s

Switch-off delay



Navigation Expert → Output → PFS output 1 to n → Switch-off delay (0465-1 to n)

Prerequisite

- The **Switch** option is selected in the **Operating mode** parameter (→ 128).
- The **Limit** option is selected in the **Switch out funct** parameter (→ 141).

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 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 (→  128).

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)

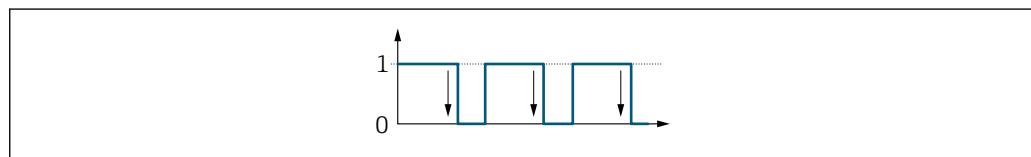
Description Use this function to select whether to invert the output signal.

Selection

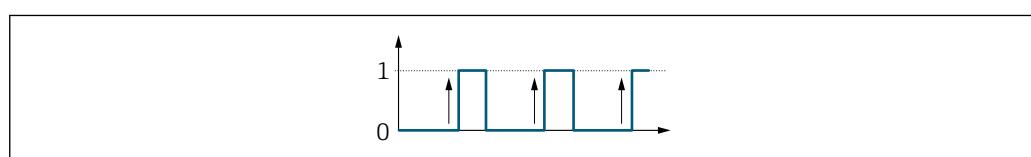
- No
- Yes

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.	→ 148
Relay outp.func.	→ 149
Assign dir.check	→ 149
Assign limit	→ 150
Assign diag. beh	→ 151
Assign status	→ 151
Switch-off value	→ 151
Switch-off delay	→ 152
Switch-on value	→ 152
Switch-on delay	→ 153
Failure mode	→ 153
Switch status	→ 154
Powerless relay	→ 154

Terminal no.

Navigation

Expert → Output → Relay output 1 to n → Terminal no. (0812-1 to n)

Description

Displays the terminal numbers used by the relay output module.

User interface

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

Additional information

"Not used" option

The relay output module does not use any terminal numbers.

Relay outp.func.

Navigation Expert → Output → Relay output 1 to n → Relay outp.func. (0804–1 to n)

Description Use this function to select an output function for the relay output.

Selection

- Closed
- Open
- Diag. behavior
- Limit
- Fl. direct.check
- Digital Output

Factory setting Closed

Additional information *Selection*

- Closed
The relay output is permanently switched on (closed, conductive).
- Open
The relay output is permanently switched off (open, non-conductive).
- Diag. behavior
Indicates if the diagnostic event is present or not. Is used to output diagnostic information and to react to it appropriately at the system level.
- Limit
Indicates if a specified limit value has been reached for the process variable. Is used to output diagnostic information relating to the process and to react to it appropriately at the system level.
- Fl. direct.check
Indicates the flow direction (forward or reverse flow).
- Digital Output
Indicates the device status depending on whether empty pipe detection or low flow cut off is selected.

Assign dir.check

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

Prerequisite In the **Relay outp.func.** parameter (→ 149), the **Fl. direct.check** option is selected.

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

Selection

- Off
- Volume flow
- Mass flow
- Correct.vol.flow

Factory setting Mass flow

Assign limit**Navigation**

Expert → Output → Relay output 1 to n → Assign limit (0807-1 to n)

PrerequisiteThe **Limit** option is selected in the **Relay outp.func.** parameter (→ 149) parameter.**Description**

Use this function to select a process variable for the limit value 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.
- Dynam. viscosity ^{*}
- Concentration ^{*}
- Kinematic visc. ^{*}
- TempCompDynVisc ^{*}
- TempCompKinVisc
- Temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Oscil. damping
- Pressure

Factory setting

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 (→ 149), 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	<ul style="list-style-type: none"> ▪ Alarm ▪ Alarm or warning ▪ Warning
Factory setting	Alarm
Additional information	<p><i>Description</i></p> <p> If no diagnostic event is pending, the relay output is closed and conductive.</p> <p><i>Selection</i></p> <ul style="list-style-type: none"> ▪ 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 (→ 149), the Digital Output option is selected.
Description	Use this function to select the device status for the relay output.
Selection	<ul style="list-style-type: none"> ▪ Partial pipe det ▪ Low flow cut off
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 (→ 149), the Limit option is selected.
Description	Use this function to enter the measured value for the switch-off point.

User entry	Signed floating-point number
Factory setting	Country-specific: <ul style="list-style-type: none">■ 0 kg/h■ 0 lb/min
Additional information	<p><i>Description</i></p> <p>Use this function to enter the limit value for the switch-off value (process variable < switch-off value = open, non-conductive).</p> <p> When using a hysteresis: Switch-on value > Switch-off value.</p> <p><i>Dependency</i></p> <p> The unit is dependent on the process variable selected in the Assign limit parameter (→ 150).</p>

Switch-off delay



Navigation	 Expert → Output → Relay output 1 to n → Switch-off delay (0813-1 to n)
Prerequisite	In the Relay outp.func. parameter (→ 149), the Limit option is selected.
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

Switch-on value



Navigation	 Expert → Output → Relay output 1 to n → Switch-on value (0810-1 to n)
Prerequisite	In the Relay outp.func. parameter (→ 149), 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: <ul style="list-style-type: none">■ 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 (→ 150).

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 (→ 149), 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

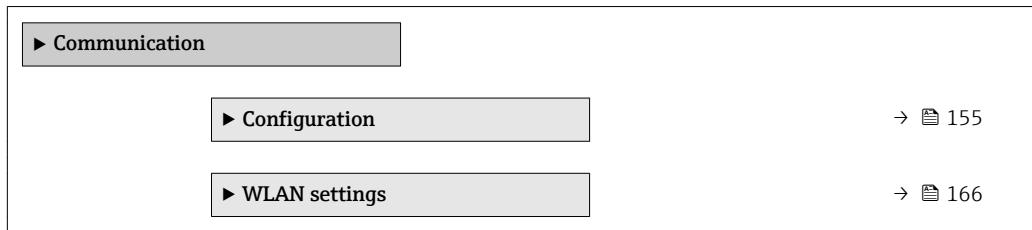
Factory setting Open

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 "Configuration" submenu

Navigation

Expert → Communication → Configuration

▶ Configuration	
▶ Input assembly	→ 159
Webserv.language (7221)	→ 155
MAC Address (7214)	→ 156
Default netw.set (7401)	→ 156
DHCP client (7212)	→ 156
IP address (7209)	→ 157
Subnet mask (7211)	→ 157
Default gateway (7210)	→ 157
Webserver funct. (7222)	→ 158
Login page (7273)	→ 158
Capability flags (7439)	→ 158
User description (7432)	→ 159

Webserv.language

Navigation

Expert → Communication → Configuration → 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 *

* Visibility depends on order options or device settings

- 中文 (Chinese) *
- 日本語 (Japanese) *
- 한국어 (Korean) *
- Bahasa Indonesia *
- tiếng Việt (Viet) *
- čeština (Czech)

Factory setting

English

MAC Address

Navigation	 Expert → Communication → Configuration → MAC Address (7214)
Description	Displays the MAC ⁸⁾ 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	<p><i>Example</i></p> <p>For the display format 00:07:05:10:01:5F</p>

Default netw.set

Navigation	 Expert → Communication → Configuration → Default netw.set (7401)
Description	Displays the use of default network settings.
User interface	<ul style="list-style-type: none"> ■ Off ■ On
Factory setting	Off
Additional information	<p><i>User interface</i></p> <p>The On option is displayed as soon as the last octet of the IP address is set via DIP switches.</p>

DHCP client

Navigation	 Expert → Communication → Configuration → DHCP client (7212)
Description	Use this function to activate and deactivate the DHCP client functionality.

* Visibility depends on order options or device settings

8) Media Access Control

Selection	<ul style="list-style-type: none">■ Off■ On
Factory setting	Off
Additional information	<i>Result</i> If the DHCP client functionality of the Web server is activated, the IP address (→ 157), Subnet mask (→ 157) and Default gateway (→ 157) are set automatically.
	 Identification is via the MAC address of the measuring device.

IP address



Navigation	 Expert → Communication → Configuration → IP address (7209)
Description	Displays the IP address of the Web server of the measuring device.
User entry	4 octet: 0 to 255 (in the particular octet)
Factory setting	192.168.1.212

Subnet mask



Navigation	 Expert → Communication → Configuration → Subnet mask (7211)
Description	Use this function to 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 → Configuration → Default gateway (7210)
Description	Use this function to enter the default gateway.
User entry	4 octet: 0 to 255 (in the particular octet)
Factory setting	0.0.0.0

Webserver funct.**Navigation**

Expert → Communication → Configuration → 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.

Options

Option	Description
Off	<ul style="list-style-type: none">▪ The web server is completely disabled.▪ Port 80 is locked.
On	<ul style="list-style-type: none">▪ The complete functionality of the web server is available.▪ JavaScript is used.▪ The password is transferred in an encrypted state.▪ Any change to the password is also transferred in an encrypted state.

Login page**Navigation**

Expert → Communication → Configuration → Login page (7273)

Description

Use this function to select the format of the login page.

Selection

- Without header
- With header

Factory setting

With header

Capability flags**Navigation**

Expert → Communication → Configuration → Capability flags (7439)

Description

Displays the DLR (Device Level Ring) properties of the device.

User interface

- Announce-b. node
- Beacon-b. node
- Supervisor cap.
- Redund. gateway
- Flush tab. frame

Factory setting Beacon-b. node

User description



Navigation Expert → Communication → Configuration → User description (7432)

Description Use this function to enter the user-defined device name and location (separated by a semicolon).

Factory setting description;location

"Input assembly" submenu

Navigation Expert → Communication → Configuration → Input assembly

Input assembly	
Position 1 (7402)	→ 160
Position 2 (7413)	→ 161
Position 3 (7415)	→ 161
Position 4 (7416)	→ 161
Position 5 (7417)	→ 162
Position 6 (7418)	→ 162
Position 7 (7419)	→ 162
Position 8 (7420)	→ 162
Position 9 (7421)	→ 163
Position 10 (7403)	→ 163
Position 11 (7404)	→ 163
Position 12 (7405)	→ 164
Position 13 (7406)	→ 164
Position 14 (7407)	→ 164

Position 15 (7408)	→ 164
Position 16 (7409)	→ 165
Position 17 (7410)	→ 165
Position 18 (7411)	→ 165
Position 19 (7412)	→ 165
Position 20 (7414)	→ 166

Position 1**Navigation**

Expert → Communication → Configuration → Input assembly → Position 1 (7402)

Description

Use this function to select a process variable for input value 1.

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
- Concentration
- Dynam. viscosity
- Kinematic visc.
- TempCompDynVisc
- TempCompKinVisc
- Temperature
- Carr. pipe temp.
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1
- Osc. ampl. 0
- Osc. ampl. 1
- Freq. fluct. 0
- Freq. fluct. 1
- Osc. damping 0
- Osc. damping 1
- Osc.damp.fluct 0
- Osc.damp.fluct 1
- Signal asymmetry
- Exc. current 0
- Exc. current 1
- Spv.exc.curr. 1

- Spv.exc.curr. 2
- HBSI
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Ref.dens.altern.
- GSV flow
- GSVA
- NSV flow
- NSVA
- S&W volume flow

Factory setting Mass flow

Position 2



Navigation	Expert → Communication → Configuration → Input assembly → Position 2 (7413)
Description	Use this function to select a process variable for input value 2.
Selection	Picklist, see Input assembly position 1 parameter (→ 160)
Factory setting	Volume flow

Position 3



Navigation	Expert → Communication → Configuration → Input assembly → Position 3 (7415)
Description	Use this function to select a process variable for input value 3.
Selection	Picklist, see Input assembly position 1 parameter (→ 160)
Factory setting	Correct.vol.flow

Position 4



Navigation	Expert → Communication → Configuration → Input assembly → Position 4 (7416)
Description	Use this function to select a process variable for input value 4.
Selection	Picklist, see Input assembly position 1 parameter (→ 160)
Factory setting	Temperature

Position 5

Navigation Expert → Communication → Configuration → Input assembly → Position 5 (7417)

Description Use this function to select a process variable for input value 5.

Selection Picklist, see **Input assembly position 1** parameter (→ 160)

Factory setting Density

Position 6

Navigation Expert → Communication → Configuration → Input assembly → Position 6 (7418)

Description Use this function to select a process variable for input value 6.

Selection Picklist, see **Input assembly position 1** parameter (→ 160)

Factory setting Ref.density

Position 7

Navigation Expert → Communication → Configuration → Input assembly → Position 7 (7419)

Description Use this function to select a process variable for input value 7.

Selection Picklist, see **Input assembly position 1** parameter (→ 160)

Factory setting Spv.exc.curr. 1

Position 8

Navigation Expert → Communication → Configuration → Input assembly → Position 8 (7420)

Description Use this function to select a process variable for input value 8.

Selection Picklist, see **Input assembly position 1** parameter (→ 160)

Factory setting Totalizer 1

Position 9

Navigation Expert → Communication → Configuration → Input assembly → Position 9 (7421)

Description Use this function to select a process variable for input value 9.

Selection Picklist, see **Input assembly position 1** parameter (→ 160)

Factory setting Totalizer 2

Position 10

Navigation Expert → Communication → Configuration → Input assembly → Position 10 (7403)

Description Use this function to select a process variable for input value 10.

Selection Picklist, see **Input assembly position 1** parameter (→ 160)

Factory setting Totalizer 3

Position 11

Navigation Expert → Communication → Configuration → Input assembly → Position 11 (7404)

Description Use this function to select a process variable for input value 11.

Selection

- Off
- Actual diagnos.
- Prev.diagnostics
- Mass flow unit
- Volume flow unit
- Cor.volflow unit
- Temperature unit
- Density unit
- Ref. dens. unit
- Concentr. unit
- Dyn. visc. unit
- Kin. visc. unit
- Current unit
- Unit totalizer 1
- Unit totalizer 2
- Unit totalizer 3
- Verific. results
- Verific. status

Factory setting Mass flow unit

Position 12

Navigation	Expert → Communication → Configuration → Input assembly → Position 12 (7405)
Description	Use this function to select a process variable for input value 12.
Selection	Picklist, see Input assembly position 11 parameter (→ 163)
Factory setting	Volume flow unit

Position 13

Navigation	Expert → Communication → Configuration → Input assembly → Position 13 (7406)
Description	Use this function to select a process variable for input value 13.
Selection	Picklist, see Input assembly position 11 parameter (→ 163)
Factory setting	Cor.volflow unit

Position 14

Navigation	Expert → Communication → Configuration → Input assembly → Position 14 (7407)
Description	Use this function to select a process variable for input value 14.
Selection	Picklist, see Input assembly position 11 parameter (→ 163)
Factory setting	Temperature unit

Position 15

Navigation	Expert → Communication → Configuration → Input assembly → Position 15 (7408)
Description	Use this function to select a process variable for input value 15.
Selection	Picklist, see Input assembly position 11 parameter (→ 163)
Factory setting	Density unit

Position 16

Navigation Expert → Communication → Configuration → Input assembly → Position 16 (7409)

Description Use this function to select a process variable for input value 16.

Selection Picklist, see **Input assembly position 11** parameter (→ 163)

Factory setting Ref. dens. unit

Position 17

Navigation Expert → Communication → Configuration → Input assembly → Position 17 (7410)

Description Use this function to select a process variable for input value 17.

Selection Picklist, see **Input assembly position 11** parameter (→ 163)

Factory setting Current unit

Position 18

Navigation Expert → Communication → Configuration → Input assembly → Position 18 (7411)

Description Use this function to select a process variable for input value 18.

Selection Picklist, see **Input assembly position 11** parameter (→ 163)

Factory setting Unit totalizer 1

Position 19

Navigation Expert → Communication → Configuration → Input assembly → Position 19 (7412)

Description Use this function to select a process variable for input value 19.

Selection Picklist, see **Input assembly position 11** parameter (→ 163)

Factory setting Unit totalizer 2

Position 20**Navigation**

Expert → Communication → Configuration → Input assembly → Position 20 (7414)

Description

Use this function to select a process variable for input value 20.

Selection

Picklist, see **Input assembly position 11** parameter (→ [163](#))

Factory setting

Unit totalizer 3

3.6.2 "WLAN settings" submenu

Navigation

Expert → Communication → WLAN settings

► WLAN settings	
WLAN (2702)	→ 167
WLAN mode (2717)	→ 167
SSID name (2714)	→ 167
Network security (2705)	→ 168
Sec. identific. (2718)	→ 168
User name (2715)	→ 168
WLAN password (2716)	→ 169
WLAN IP address (2711)	→ 169
WLAN MAC address (2703)	→ 169
WLAN subnet mask (2709)	→ 169
WLAN MAC address (2703)	→ 169
WLAN passphrase (2706)	→ 170
Assign SSID name (2708)	→ 170
SSID name (2707)	→ 170
WLAN channel (2704)	→ 171

Select antenna (2713)	→ 171
Connection state (2722)	→ 171
Rec.sig.strength (2721)	→ 171
WLAN IP address (2711)	→ 169
Gateway IP addr. (2719)	→ 172
IP address DNS (2720)	→ 172

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).

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**

- Root certificate
- Device certific.
- Dev. private key

User name**Navigation** Expert → Communication → WLAN settings → User name (2715)**Description** Use this function to enter the user name.**User entry**

–

Factory setting

–

WLAN password

Navigation Expert → Communication → WLAN settings → WLAN password (2716)

Description Use this function to enter the WLAN password.

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)

Expert → Communication → WLAN settings → WLAN MAC address (2703)

Description Displays the MAC⁹⁾ 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 **WPA2-PSK** option is selected in the **Security type** parameter (→ 168).

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 SSID¹⁰⁾.

- Selection**
- Device tag
 - User-defined

Factory setting User-defined

Additional information *Selection*

- Device tag
The device tag name is used as the SSID.
- User-defined
A user-defined name is used as the SSID.

SSID name



Navigation Expert → Communication → WLAN settings → SSID name (2707)

Prerequisite

- The **User-defined** option is selected in the **Assign SSID name** parameter (→ 170).
- The **Access point** option is selected in the **WLAN mode** parameter (→ 167).

Description Use this function to enter a user-defined SSID name.

User entry Max. 32-digit character string comprising numbers, letters and special characters

Factory setting EH_device designation_last 7 digits of the serial number (e.g.
EH_Promass_300_A802000)

10) Service Set Identifier

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

Navigation Expert → Communication → WLAN settings → Rec.sig.strength (2721)

Description Displays the signal strength received.

User interface

- Low
- Medium
- High

Factory setting High

Gateway IP addr.

Navigation  Expert → Communication → WLAN settings → Gateway IP addr. (2719)

Description Use this function to enter the IP address of the gateway.

Factory setting 192.168.1.212

IP address DNS

Navigation  Expert → Communication → WLAN settings → IP address DNS (2720)

 Expert → Communication → WLAN settings → IP address DNS (2720)

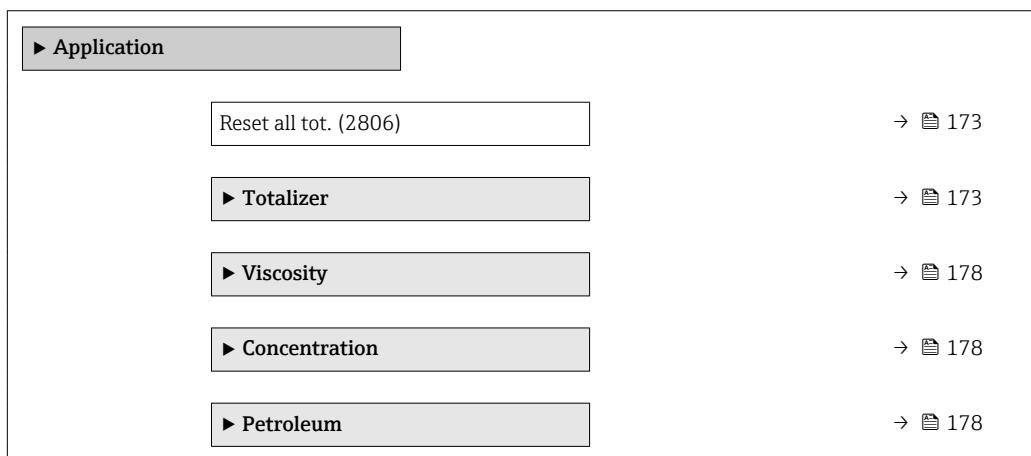
Description Use this function to enter the IP address of the domain name server.

Factory setting 192.168.1.212

3.7 "Application" submenu

Navigation

 Expert → Application



Reset all tot.**Navigation**
  Expert → Application → Reset all tot. (2806)
Description

Use this function to reset all totalizers to the value **0** and restart the totaling process. This deletes all the flow values previously totalized.

Selection

- Cancel
- Reset + totalize

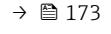
Factory setting

Cancel

Additional information*Selection*

Options	Description
Cancel	No action is executed and the user exits the parameter.
Reset + totalize	Resets all totalizers to 0 and restarts the totaling process. This deletes all the flow values previously totalized.

3.7.1 "Totalizer 1 to n" submenu**Navigation**
  Expert → Application → Totalizer 1 to n

► Totalizer 1 to n	
Assign variable (0914-1 to n)	→  173
Unit totalizer 1 to n (0915-1 to n)	→  174
Operation mode (0908-1 to n)	→  175
Control Tot. 1 to n (0912-1 to n)	→  176
Preset value 1 to n (0913-1 to n)	→  177
Failure mode (0901-1 to n)	→  177

Assign variable**Navigation**
  Expert → Application → Totalizer 1 to n → Assign variable (0914-1 to n)
Description

Use this function to select a process variable for the Totalizer 1 to n.

Selection

- Off
- 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 *
- GSV flow *
- GSVA *
- NSV flow *
- NSVA *
- S&W volume flow *
- Oil mass flow *
- Water mass flow *
- Oil volume flow *
- Water vol. flow *
- Oil corr.vol.fl. *
- Water corr.v.fl. *

Factory setting

Mass flow

Additional information*Description*

 If the option selected is changed, the device resets the totalizer to 0.

Selection

If the **Off** option is selected, only **Assign variable** parameter (→ 173) is still displayed in the **Totalizer 1 to n** submenu. All other parameters in the submenu are hidden.

Unit totalizer 1 to n**Navigation**

 Expert → Application → Totalizer 1 to n → Unit totalizer 1 to n (0915–1 to n)

Prerequisite

A process variable is selected in the **Assign variable** parameter (→ 173) of the **Totalizer 1 to n** submenu.

Description

Use this function to select the process variable unit for the Totalizer 1 to n (→ 173).

Selection*SI units*

- g
- kg
- t

US units

- oz
- lb
- STon

or

* Visibility depends on order options or device settings

<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
■ cm ³	■ af	■ gal (imp)
■ dm ³	■ ft ³	■ Mgal (imp)
■ m ³	■ fl oz (us)	■ bbl (imp;oil)
■ ml	■ gal (us)	
■ l	■ kgal (us)	
■ hl	■ Mgal (us)	
■ Ml Mega	■ bbl (us;oil)	
	■ bbl (us;tank)	

or

<i>US units</i>	<i>Imperial units</i>
■ bbl (us;liq.)	bbl (imp;beer)
■ bbl (us;beer)	

or

<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
■ Nl	■ Sft ³	Sgal (imp)
■ Nm ³	■ Sgal (us)	
■ Sl	■ Sbbl (us;liq.)	
■ Sm ³		

or

Other units

None

Factory setting

Country-specific:

- kg
- lb

Additional information*Description*

 The unit is selected separately for each totalizer. It is independent of the selection made in the **System units** submenu (→ 61).

Selection

The selection is dependent on the process variable selected in the **Assign variable** parameter (→ 173).

Operation mode**Navigation**

Expert → Application → Totalizer 1 to n → Operation mode (0908-1 to n)

Prerequisite

A process variable is selected in the **Assign variable** parameter (→ 173) of the **Totalizer 1 to n** submenu.

Description

Use this function to select how the totalizer summates the flow.

Selection	<ul style="list-style-type: none"> ■ Net flow total ■ Forward total ■ Reverse total
Factory setting	Net flow total
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Net flow total Flow values in the forward and reverse flow direction are totaled and balanced against one another. Net flow is registered in the flow direction. ■ Forward total Only the flow in the forward flow direction is totaled. ■ Reverse total Only the flow in the reverse flow direction is totaled (= reverse flow quantity).

Control Tot. 1 to n

Navigation	Expert → Application → Totalizer 1 to n → Control Tot. 1 to n (0912–1 to n)														
Prerequisite	A process variable is selected in the Assign variable parameter (→ 173) of the Totalizer 1 to n submenu.														
Description	Use this function to select the control of totalizer value 1-3.														
Selection	<ul style="list-style-type: none"> ■ Totalize ■ Reset + hold ■ Preset + hold ■ Reset + totalize ■ Preset+totalize ■ Hold 														
Factory setting	Totalize														
Additional information	<p><i>Selection</i></p> <table border="1"> <thead> <tr> <th>Options</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Totalize</td> <td>The totalizer is started or continues running.</td> </tr> <tr> <td>Reset + hold</td> <td>The totaling process is stopped and the totalizer is reset to 0.</td> </tr> <tr> <td>Preset + hold</td> <td>The totaling process is stopped and the totalizer is set to its defined start value from the Preset value parameter.</td> </tr> <tr> <td>Reset + totalize</td> <td>The totalizer is reset to 0 and the totaling process is restarted.</td> </tr> <tr> <td>Preset+totalize</td> <td>The totalizer is set to the defined start value from the Preset value parameter and the totaling process is restarted.</td> </tr> <tr> <td>Hold</td> <td>Totalizing is stopped.</td> </tr> </tbody> </table>	Options	Description	Totalize	The totalizer is started or continues running.	Reset + hold	The totaling process is stopped and the totalizer is reset to 0.	Preset + hold	The totaling process is stopped and the totalizer is set to its defined start value from the Preset value parameter.	Reset + totalize	The totalizer is reset to 0 and the totaling process is restarted.	Preset+totalize	The totalizer is set to the defined start value from the Preset value parameter and the totaling process is restarted.	Hold	Totalizing is stopped.
Options	Description														
Totalize	The totalizer is started or continues running.														
Reset + hold	The totaling process is stopped and the totalizer is reset to 0.														
Preset + hold	The totaling process is stopped and the totalizer is set to its defined start value from the Preset value parameter.														
Reset + totalize	The totalizer is reset to 0 and the totaling process is restarted.														
Preset+totalize	The totalizer is set to the defined start value from the Preset value parameter and the totaling process is restarted.														
Hold	Totalizing is stopped.														

Preset value 1 to n

Navigation	  Expert → Application → Totalizer 1 to n → Preset value 1 to n (0913-1 to n)
Prerequisite	A process variable is selected in the Assign variable parameter (→  173) of the Totalizer 1 to n submenu.
Description	Use this function to enter a start value for the Totalizer 1 to n.
User entry	Signed floating-point number
Factory setting	Country-specific: <ul style="list-style-type: none">■ 0 kg■ 0 lb
Additional information	<i>User entry</i>  The unit of the selected process variable is specified for the totalizer in the Unit totalizer parameter (→  174).
	<i>Example</i> This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.

Failure mode

Navigation	  Expert → Application → Totalizer 1 to n → Failure mode (0901-1 to n)
Prerequisite	A process variable is selected in the Assign variable parameter (→  173) of the Totalizer 1 to n submenu.
Description	Use this function to select how a totalizer behaves in the event of a device alarm.
Selection	<ul style="list-style-type: none">■ Stop■ Actual value■ Last valid value
Factory setting	Stop

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
The totalizer is stopped in the event of a device alarm.
- Actual value
The totalizer continues to count based on the actual 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.

3.7.2 "Viscosity" submenu



Only available for Promass I.



For detailed information on the parameter descriptions for the **Viscosity** application package, refer to the Special Documentation for the device → 7

Navigation

Expert → Application → Viscosity

Viscosity

3.7.3 "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

3.7.4 "Petroleum" submenu



For detailed information on the parameter descriptions for the **Petroleum** application package, refer to the Special Documentation for the device → 7

Navigation

Expert → Application → Petroleum

Petroleum

3.8 "Diagnostics" submenu

Navigation

Expert → Diagnostics

► Diagnostics	
Actual diagnos. (0691)	→ 179
Prev.diagnostics (0690)	→ 180
Time fr. restart (0653)	→ 181
Operating time (0652)	→ 181
► Diagnostic list	
► Event logbook	→ 186
► Device info	→ 188
► Main elec.+I/O1	→ 192
► Sens. electronic	→ 193
► I/O module 2	→ 195
► I/O module 3	→ 196
► Display module	→ 197
► Min/max val.	→ 198
► Data logging	→ 209
► Heartbeat	→ 218
► Simulation	→ 218

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 (→ [182](#)).

 Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.

Example

For the display format:
F271 Main electronics

Timestamp**Navigation**

 Expert → Diagnostics → Timestamp

Description

Displays the operating time when the current diagnostic message occurred.

User interface

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

Additional information*Display*

 The diagnostic message can be viewed via the **Actual diagnos.** parameter (→ [179](#)).

Example

For the display format:
24d12h13m00s

Prev.diagnostics**Navigation**

  Expert → Diagnostics → Prev.diagnostics (0690)

Prerequisite

Two diagnostic events have already occurred.

Description

Displays the diagnostic message that occurred before the current message.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

 Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.

Example

For the display format:
F271 Main electronics

Timestamp

Navigation	  Expert → Diagnostics → Timestamp
Description	Displays the operating time when the last diagnostic message before the current message occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<i>Display</i>  The diagnostic message can be viewed via the Prev.diagnostics parameter (→  180).
	<i>Example</i> 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)

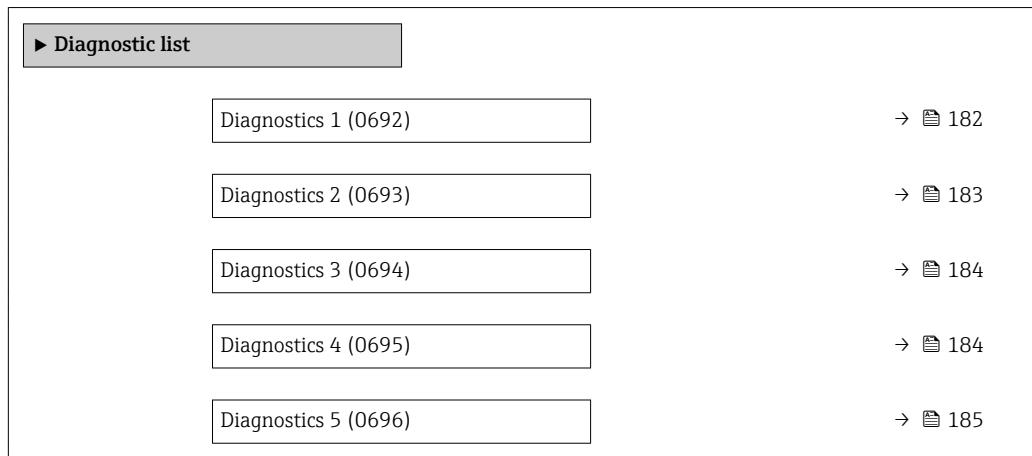
Operating time

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	<i>User interface</i> The maximum number of days is 9999, which is equivalent to 27 years.

3.8.1 "Diagnostic list" submenu

Navigation

Expert → Diagnostics → Diagnostic list



Diagnostics 1

Navigation

Expert → Diagnostics → Diagnostic list → Diagnostics 1 (0692)

Description

Displays the current diagnostics message with the highest priority.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information

Display

i Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the **E** key.

Examples

For the display format:

- **F271** Main electronics
- **F276** I/O module

Timestamp

Navigation

Expert → Diagnostics → Diagnostic list → Timestamp

Description

Displays the operating time when the diagnostic message with the highest priority occurred.

User interface

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

Additional information*Display*

The diagnostic message can be viewed via the **Diagnostics 1** parameter (→ 182).

Example

For the display format:

24d12h13m00s

Diagnostics 2

Navigation

Expert → Diagnostics → Diagnostic list → Diagnostics 2 (0693)

Description

Displays the current diagnostics message with the second-highest priority.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

Examples

For the display format:

- F271 Main electronics
- F276 I/O module

Timestamp

Navigation

Expert → Diagnostics → Diagnostic list → Timestamp

Description

Displays the operating time when the diagnostic message with the second-highest priority occurred.

User interface

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

Additional information*Display*

The diagnostic message can be viewed via the **Diagnostics 2** parameter (→ 183).

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	<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: <ul style="list-style-type: none">▪  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	<i>Display</i>  The diagnostic message can be viewed via the Diagnostics 3 parameter (→  184).
	<i>Example</i> 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 (→  184).

Example

For the display format:
24d12h13m00s

Diagnostics 5

Navigation

  Expert → Diagnostics → Diagnostic list → Diagnostics 5 (0696)

Description

Displays the current diagnostics message with the fifth-highest priority.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

 Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.

Examples

For the display format:

-  F271 Main electronics
-  F276 I/O module

Timestamp

Navigation

█ Expert → Diagnostics → Diagnostic list → Timestamp

Description

Displays the operating time when the diagnostic message with the fifth-highest priority occurred.

User interface

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

Additional information*Display*

i The diagnostic message can be viewed via the **Diagnostics 5** parameter (→ [185](#)).

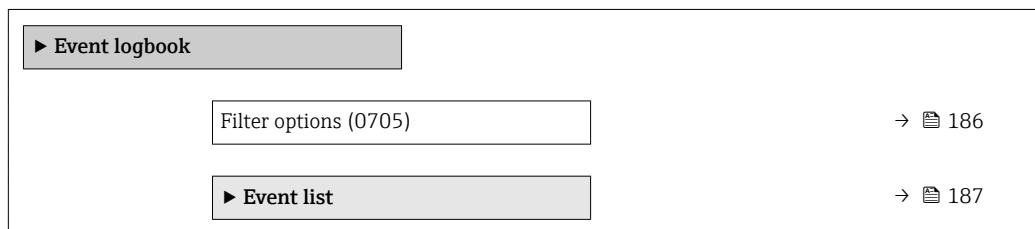
Example

For the display format:
24d12h13m00s

3.8.2 "Event logbook" submenu

Navigation

█ Expert → Diagnostics → Event logbook



Filter options**Navigation**

█ Expert → Diagnostics → Event logbook → Filter options (0705)

Description

Use this function to select the category whose event messages are displayed in the event list of the local display.

Selection

- All
- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- Information (I)

Factory setting

All

Additional information*Description*

The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:

- F = Failure
- C = Function Check
- S = Out of Specification
- M = Maintenance Required

Filter options**Navigation**

Expert → Diagnostics → Event logbook → Filter options

Description

Use this function to select the category whose event messages are displayed in the event list of the operating tool.

Selection

- All
- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- Information (I)

Factory setting

All

Additional information*Description*

The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:

- F = Failure
- C = Function Check
- S = Out of Specification
- M = Maintenance Required

"Event list" submenu

The **Event list** submenu is only displayed if operating via the local display.

If operating via the FieldCare operating tool, the event list can be read out with a separate FieldCare module.

If operating via the Web browser, the event messages can be found directly in the **Event logbook** submenu.

Navigation

Expert → Diagnostics → Event logbook → Event list



Event list**Navigation**

 Expert → Diagnostics → Event logbook → Event list

Description

Displays the history of event messages of the category selected in the **Filter options** parameter (→ [186](#)).

User interface

- For a "Category I" event message
Information event, short message, symbol for event recording and operating time when error occurred
- For a "Category F, C, S, M" event message (status signal)
Diagnostics code, short message, symbol for event recording and operating time when error occurred

Additional information*Description*

A maximum of 20 event messages are displayed in chronological order.

If the **Extended HistoROM** application package (order option) is enabled in the device, the event list can contain up to 100 entries .

The following symbols indicate whether an event has occurred or has ended:

-  Occurrence of the event
-  End of the event

Examples

For the display format:

- I1091 Configuration modified
 24d12h13m00s
-  F271 Main electronics
 01d04h12min30s

HistoROM

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

3.8.3 "Device info" submenu*Navigation*

  Expert → Diagnostics → Device info

 Device info	
Device tag (0011)	→ 189
Serial number (0009)	→ 189
Firmware version (0010)	→ 190
Device name (0020)	→ 190
Order code (0008)	→ 190

Ext. order cd. 1 (0023)	→ 191
Ext. order cd. 2 (0021)	→ 191
Ext. order cd. 3 (0022)	→ 191
Config. counter (2751)	→ 191
ENP version (0012)	→ 192

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

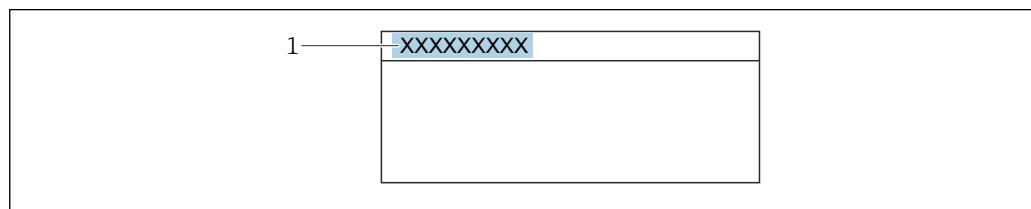
Max. 32 characters, such as letters, numbers or special characters (e.g. @, %, /).

Factory setting

Promass

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

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

Promass 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**Navigation**

Expert → Diagnostics → Device info → Ext. order cd. 2 (0021)

Description

Displays the second part of the extended order code.

User interface

Character string

Additional information

For additional information, see **Ext. order cd. 1** parameter (→ 191)

Ext. order cd. 3**Navigation**

Expert → Diagnostics → Device info → Ext. order cd. 3 (0022)

Description

Displays the third part of the extended order code.

User interface

Character string

Additional information

For additional information, see **Ext. order cd. 1** parameter (→ 191)

Config. counter**Navigation**

Expert → Diagnostics → Device info → Config. counter (2751)

Description

Displays the number of parameter modifications for the device. When the user changes a parameter setting, this counter is incremented.

User interface

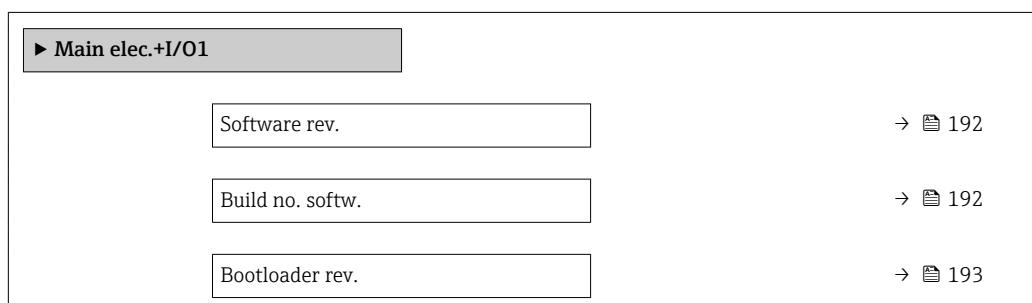
0 to 65 535

ENP version

Navigation	Expert → Diagnostics → Device info → ENP version (0012)
Description	Displays the version of the electronic nameplate.
User interface	Character string
Factory setting	2.02.00
Additional information	<i>Description</i> This electronic nameplate stores a data record for device identification that includes more data than the nameplates attached to the outside of the device.

3.8.4 "Mainboard module" submenu

Navigation Expert → Diagnostics → Main elec.+I/O1



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 Displays the software build number of the module.

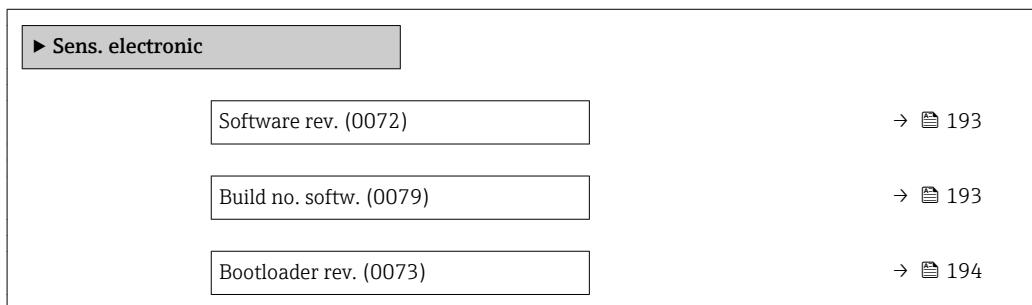
User interface Positive integer

Bootloader rev.

Navigation	  Expert → Diagnostics → Main elec.+I/O1 → Bootloader rev. (0073)
Description	Displays the bootloader revision of the software.
User interface	Positive integer

3.8.5 "Sens. electronic" submenu

Navigation   Expert → Diagnostics → Sens. electronic



Software rev.

Navigation	  Expert → Diagnostics → Sens. electronic → Software rev. (0072)
Description	Use this function to display the software revision of the module.
User interface	Positive integer

Build no. softw.

Navigation	  Expert → Diagnostics → Sens. electronic → Build no. softw. (0079)
Description	Displays the software build number of the module.
User interface	Positive integer

Bootloader rev.

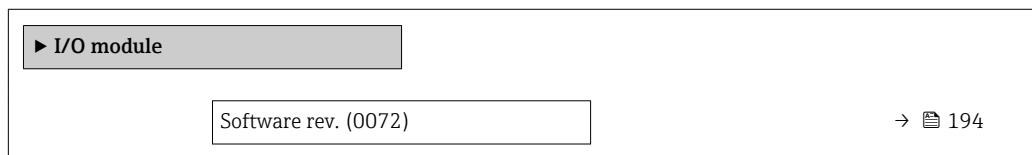
Navigation   Expert → Diagnostics → Sens. electronic → Bootloader rev. (0073)

Description Displays the bootloader revision of the software.

User interface Positive integer

3.8.6 "I/O module 1" submenu

Navigation   Expert → Diagnostics → I/O module 1



I/O 1 terminals

Navigation   Expert → Diagnostics → I/O module 1 → I/O 1 terminals (3902-1)

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

User interface

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

Software rev.

Navigation   Expert → Diagnostics → I/O module 2 → Software rev. (0072)

  Expert → Diagnostics → I/O module 3 → Software rev. (0072)

  Expert → Diagnostics → I/O module 4 → Software rev. (0072)

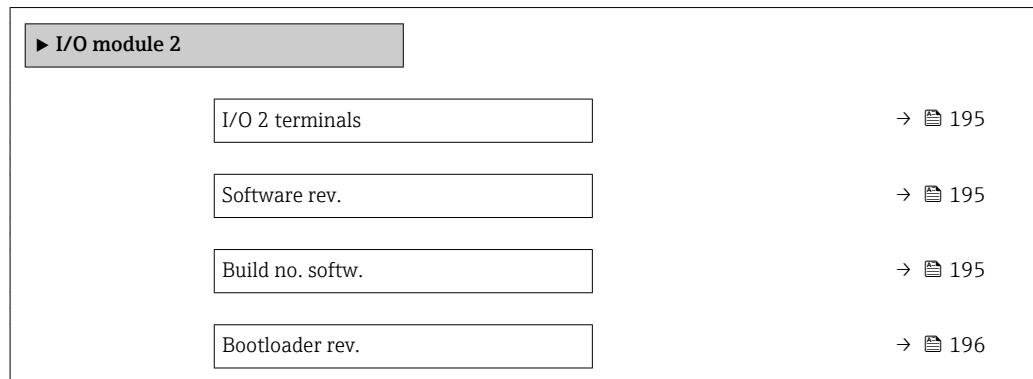
Description Use this function to display the software revision of the module.

User interface Positive integer

3.8.7 "I/O module 2" submenu

Navigation

Expert → Diagnostics → I/O module 2



I/O 1 terminals

Navigation

Expert → Diagnostics → I/O module 1 → I/O 1 terminals (3902-1)

Description

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

User interface

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

Software rev.

Navigation

Expert → Diagnostics → I/O module 2 → 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

Displays the software build number of the module.

User interface

Positive integer

Bootloader rev.

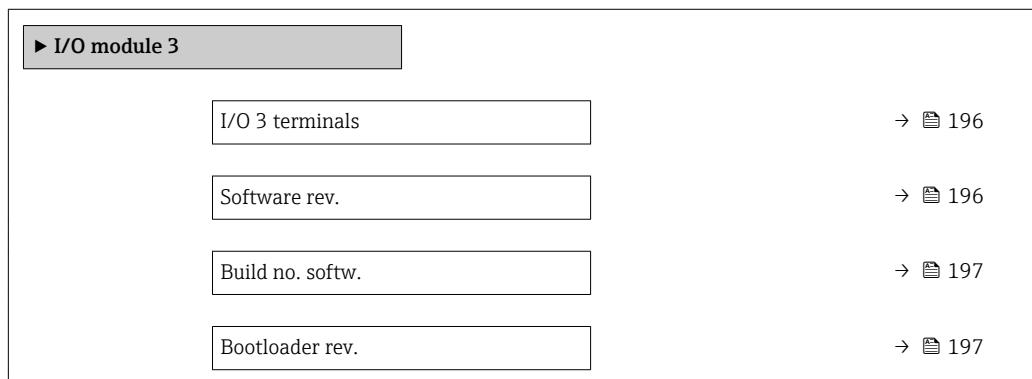
Navigation  Expert → Diagnostics → I/O module 2 → Bootloader rev. (0073)

Description Displays the bootloader revision of the software.

User interface Positive integer

3.8.8 "I/O module 3" submenu

Navigation  Expert → Diagnostics → I/O module 3



I/O 1 terminals

Navigation  Expert → Diagnostics → I/O module 1 → I/O 1 terminals (3902-1)

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

User interface

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

Software rev.

Navigation  Expert → Diagnostics → I/O module 3 → Software rev. (0072)

Description Use this function to display the software revision of the module.

User interface Positive integer

Build no. softw.

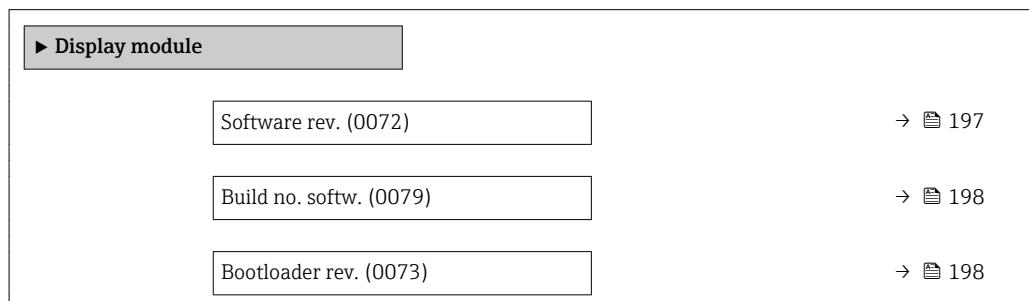
Navigation	  Expert → Diagnostics → I/O module 3 → Build no. softw. (0079)
Description	Displays the software build number of the module.
User interface	Positive integer

Bootloader rev.

Navigation	  Expert → Diagnostics → I/O module 3 → Bootloader rev. (0073)
Description	Displays the bootloader revision of the software.
User interface	Positive integer

3.8.9 "Display module" submenu

Navigation   Expert → Diagnostics → Display module



Software rev.

Navigation	  Expert → Diagnostics → Display module → Software rev. (0072)
Description	Use this function to display the software revision of the module.
User interface	Positive integer

Build no. softw.

Navigation   Expert → Diagnostics → Display module → Build no. softw. (0079)

Description Displays the software build number of the module.

User interface Positive integer

Bootloader rev.

Navigation   Expert → Diagnostics → Display module → Bootloader rev. (0073)

Description Displays the bootloader revision of the software.

User interface Positive integer

3.8.10 "Min/max val." submenu

Navigation   Expert → Diagnostics → Min/max val.

 Min/max val.	
Reset min/max (6151)	→  199
 Electronic temp.	→  199
 Medium temp.	→  200
 Carr. pipe temp.	→  201
 Oscil. frequency	→  202
 Tors.oscil.freq.	→  203
 Oscil. amplitude	→  204
 Tor. osc. amp.	→  205
 Oscil. damping	→  206
 Tors.oscil.damp.	→  206

▶ Signal asymmetry	→ 207
▶ Tors.sig.asymm.	→ 208

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
- Osc. ampl. 1 *
- Oscil. damping
- Tors.oscil.damp. *
- Oscil. frequency
- Tors.oscil.freq. *
- Signal asymmetry *
- Tors.sig.asymm.

Factory setting

Cancel

Additional information*Selection*

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

"Electronic temp." submenu*Navigation*

Expert → Diagnostics → Min/max val. → Electronic temp.

▶ Electronic temp.	
Minimum value	→ 200
Maximum value	→ 200

* Visibility depends on order options or device settings

Maximum value

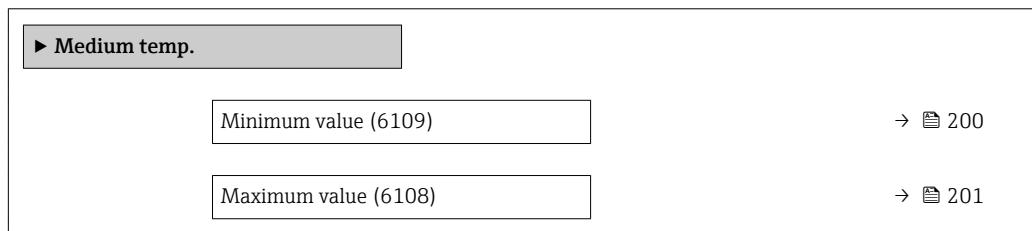
Navigation	  Expert → Diagnostics → Min/max val. → Electronic temp. → Maximum value (6051)
Description	Displays the highest previously measured temperature value of the main electronics module.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Temperature unit parameter (→ 69)

Minimum value

Navigation	  Expert → Diagnostics → Min/max val. → Electronic temp. → Minimum value (6052)
Description	Displays the lowest previously measured temperature value of the main electronics module.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Temperature unit parameter (→ 69)

"Medium temp." submenu

Navigation   Expert → Diagnostics → Min/max val. → Medium temp.



Minimum value

Navigation	  Expert → Diagnostics → Min/max val. → Medium temp. → Minimum value (6109)
Description	Displays the lowest previously measured medium temperature value.
User interface	Signed floating-point number

Additional information*Dependency*

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

Maximum value**Navigation**

Expert → Diagnostics → Min/max val. → Medium temp. → Maximum value (6108)

Description

Displays the highest previously measured medium temperature value.

User interface

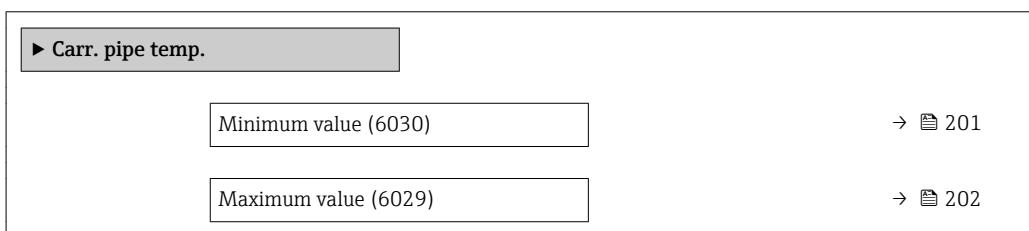
Signed floating-point number

Additional information*Dependency*

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

"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

Only available for:

- Promass A
- Promass F
- Promass H
- Promass I
- Promass O
- Promass P
- PromassQ
- Promass S
- Promass X

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 (→ [69](#))

Maximum value

Navigation  Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Maximum value (6029)

Prerequisite

 Only available for:

- Promass A
- Promass F
- Promass H
- Promass I
- Promass O
- Promass P
- PromassQ
- Promass S
- Promass X

For the following order code
"Application package", option **EB** "Heartbeat Verification + Monitoring"

Description Displays the highest previously measured temperature value of the carrier pipe.

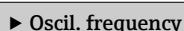
User interface Signed floating-point number

Additional information *Dependency*

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

"Oscil. frequency" submenu

Navigation  Expert → Diagnostics → Min/max val. → Oscil. frequency

 **Oscil. frequency**

Minimum value (6071)	→ 203
Maximum value (6070)	→ 203

Minimum value

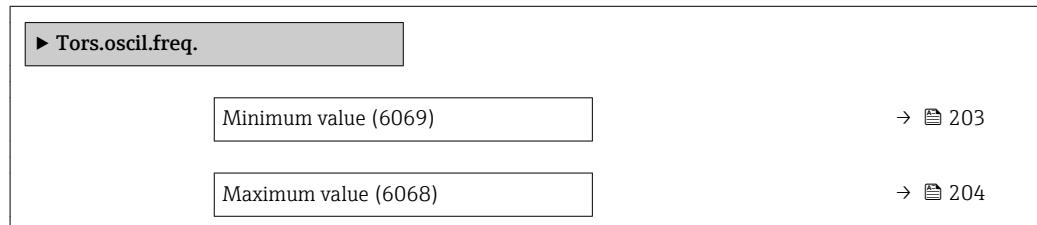
Navigation	  Expert → Diagnostics → Min/max val. → Oscil. frequency → Minimum value (6071)
Description	Displays the lowest previously measured oscillation frequency.
User interface	Signed floating-point number

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

"Tors.oscil.freq." submenu

Navigation   Expert → Diagnostics → Min/max val. → Tors.oscil.freq.

**Minimum value**

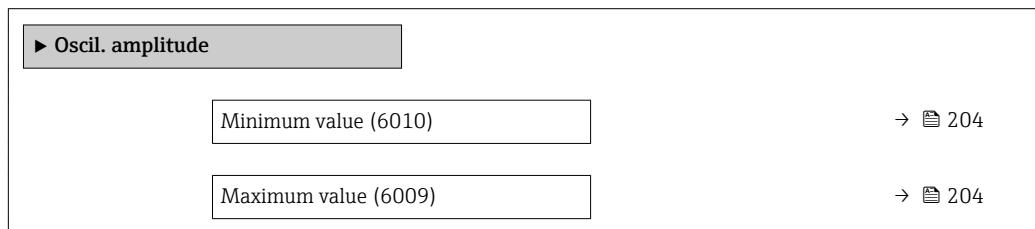
Navigation	  Expert → Diagnostics → Min/max val. → Tors.oscil.freq. → Minimum value (6069)
Prerequisite	 Only available for Promass I.
	For the following order code: "Application package", option EB "Heartbeat Verification + Monitoring"
Description	Displays the lowest previously measured torsion oscillation frequency.
User interface	Signed floating-point number

Maximum value

Navigation	 Expert → Diagnostics → Min/max val. → Tors.oscil.freq. → Maximum value (6068)
Prerequisite	 Only available for Promass I. For the following order code: "Application package", option EB "Heartbeat Verification + Monitoring"
Description	Displays the highest previously measured torsion oscillation frequency.
User interface	Signed floating-point number

"Oscil. amplitude" submenu

Navigation  Expert → Diagnostics → Min/max val. → Oscil. amplitude

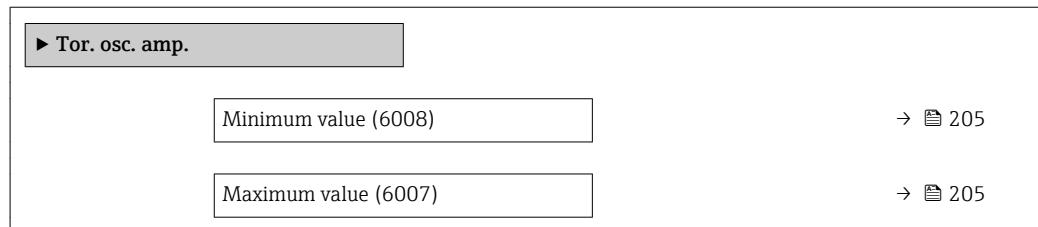


Minimum value

Navigation	 Expert → Diagnostics → Min/max val. → Oscil. amplitude → Minimum value (6010)
Description	Displays the lowest previously measured oscillation amplitude.
User interface	Signed floating-point number

Maximum value

Navigation	 Expert → Diagnostics → Min/max val. → Oscil. amplitude → Maximum value (6009)
Description	Displays the highest previously measured oscillation amplitude.
User interface	Signed floating-point number

"Tor. osc. amp." submenu**Navigation**  Expert → Diagnostics → Min/max val. → Tor. osc. amp.

Minimum value

Navigation  Expert → Diagnostics → Min/max val. → Tor. osc. amp. → Minimum value (6008)**Prerequisite** Only available for Promass I.

For the following order code:
"Application package", option **EB** "Heartbeat Verification + Monitoring"

Description

Displays the lowest previously measured torsion oscillation amplitude.

User interface

Signed floating-point number

Maximum value

Navigation  Expert → Diagnostics → Min/max val. → Tor. osc. amp. → Maximum value (6007)**Prerequisite** Only available for Promass I.

For the following order code:
"Application package", option **EB** "Heartbeat Verification + Monitoring"

Description

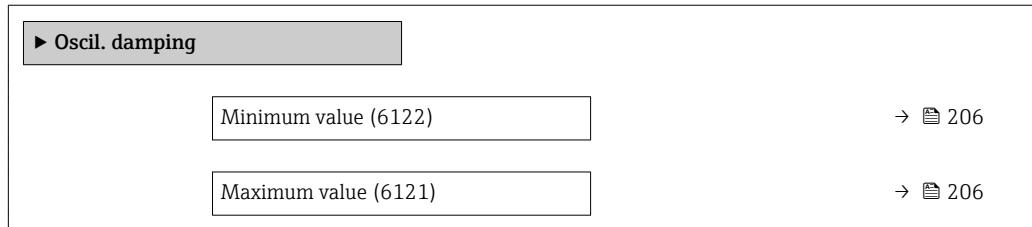
Displays the highest previously measured torsion oscillation amplitude.

User interface

Signed floating-point number

"Oscil. damping" submenu**Navigation**

Expert → Diagnostics → Min/max val. → Oscil. damping



Minimum value

Navigation

Expert → Diagnostics → Min/max val. → Oscil. damping → Minimum value (6122)

Description

Displays the lowest previously measured oscillation damping.

User interface

Signed floating-point number

Maximum value

Navigation

Expert → Diagnostics → Min/max val. → Oscil. damping → Maximum value (6121)

Description

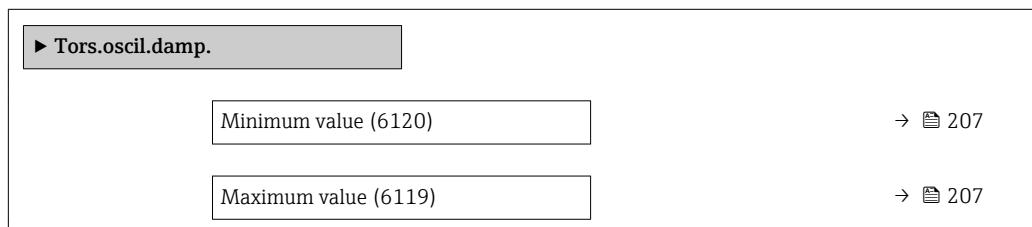
Displays the highest previously measured oscillation damping.

User interface

Signed floating-point number

"Tors.oscil.damp." submenu**Navigation**

Expert → Diagnostics → Min/max val. → Tors.oscil.damp.



Minimum value

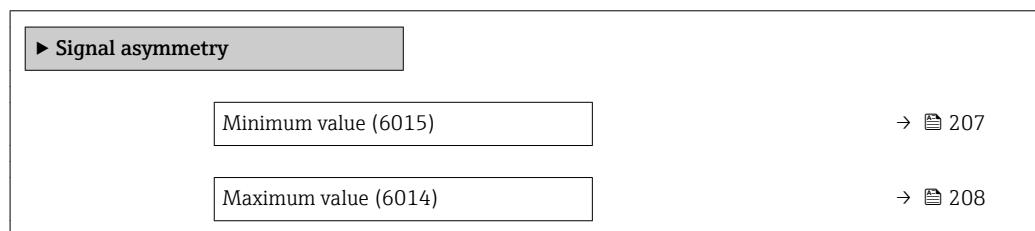
Navigation	Expert → Diagnostics → Min/max val. → Tors.oscil.damp. → Minimum value (6120)
Prerequisite	 Only available for Promass I. For the following order code: "Application package", option EB "Heartbeat Verification + Monitoring"
Description	Displays the lowest previously measured torsion oscillation damping.
User interface	Signed floating-point number

Maximum value

Navigation	Expert → Diagnostics → Min/max val. → Tors.oscil.damp. → Maximum value (6119)
Prerequisite	 Only available for Promass I. For the following order code: "Application package", option EB "Heartbeat Verification + Monitoring"
Description	Displays the highest previously measured torsion 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

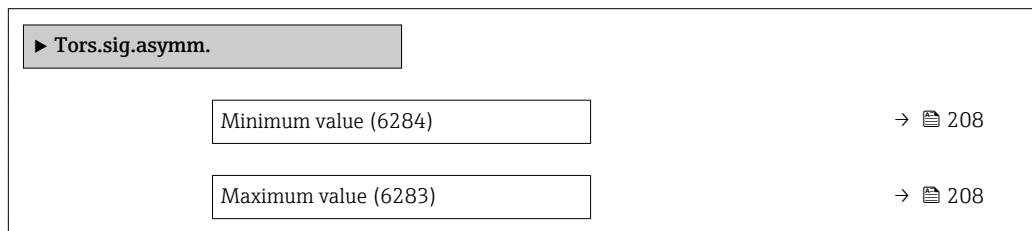
Navigation	  Expert → Diagnostics → Min/max val. → Signal asymmetry → Maximum value (6014)
------------	---

Description	Displays the highest previously measured signal asymmetry.
-------------	--

User interface	Signed floating-point number
----------------	------------------------------

"Torsion signal asymmetry" submenu

Navigation   Expert → Diagnostics → Min/max val. → Tors.sig.asymm.



Minimum value

Navigation	  Expert → Diagnostics → Min/max val. → Tors.sig.asymm. → Minimum value (6284)
------------	--

Prerequisite	 Only available for Promass I.
--------------	---

For the following order code:
"Application package", option **EB** "Heartbeat Verification + Monitoring"

Description	Displays the lowest previously measured torsion signal asymmetry.
-------------	---

User interface	Signed floating-point number
----------------	------------------------------

Maximum value

Navigation	  Expert → Diagnostics → Min/max val. → Tors.sig.asymm. → Maximum value (6283)
------------	--

Prerequisite	 Only available for Promass I.
--------------	---

For the following order code:
 "Application package", option **EB** "Heartbeat Verification + Monitoring"

Description	Displays the highest previously measured torsion signal asymmetry.
User interface	Signed floating-point number

3.8.11 "Data logging" submenu

Navigation

Expert → Diagnostics → Data logging

► Data logging	
Assign chan. 1	→ 210
Assign chan. 2	→ 211
Assign chan. 3	→ 211
Assign chan. 4	→ 212
Logging interval	→ 212
Clear logging	→ 213
Data logging	→ 213
Logging delay	→ 214
Data log.control	→ 214
Data log. status	→ 214
Logging duration	→ 215
► Displ.channel 1	→ 215
► Displ.channel 2	→ 217
► Displ.channel 3	→ 217
► Displ.channel 4	→ 217

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 (→ 45).

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
- 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 *
- Dynam. viscosity *
- Kinematic visc.
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp.*
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Oscil. amplitude *
- Osc. ampl. 1 *
- Freq. fluct. 0
- Osc. damping 0
- Osc. damping 1 *

* Visibility depends on order options or device settings

	<ul style="list-style-type: none"> ■ Osc.damp.fluct 0 ■ Osc.damp.fluct 1 * ■ Signal asymmetry ■ Exc. current 0 ■ Exc. current 1 * ■ HBSI ■ Curr.output 1 ■ Curr.output 2 * ■ Curr.output 3 * ■ Pressure
Factory setting	Off
Additional information	<p><i>Description</i></p> <p>A total of 1000 measured values can be logged. This means:</p> <ul style="list-style-type: none"> ■ 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 <p>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).</p> <p> The log contents are cleared if the option selected is changed.</p>

Assign chan. 2



Navigation	 Expert → Diagnostics → Data logging → Assign chan. 2 (0852)
Prerequisite	The Extended HistoROM application package is available.
	 The software options currently enabled are displayed in the SW option overv. parameter (→  45).
Description	Options for the assignment of a process variable to the data logging channel.
Selection	Picklist, see Assign channel 1 parameter (→  210)
Factory setting	Off

Assign chan. 3



Navigation	 Expert → Diagnostics → Data logging → Assign chan. 3 (0853)
Prerequisite	The Extended HistoROM application package is available.
	 The software options currently enabled are displayed in the SW option overv. parameter (→  45).

* Visibility depends on order options or device settings

Description	Options for the assignment of a process variable to the data logging channel.
Selection	Picklist, see Assign channel 1 parameter (→ 210)
Factory setting	Off

Assign chan. 4



Navigation Expert → Diagnostics → Data logging → Assign chan. 4 (0854)

Prerequisite The **Extended HistoROM** application package is available.

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

Description	Options for the assignment of a process variable to the data logging channel.
Selection	Picklist, see Assign channel 1 parameter (→ 210)
Factory setting	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 (→ 45).

Description	Use this function to enter the logging interval T_{log} for data logging.
User entry	0.1 to 3 600.0 s
Factory setting	1.0 s

Additional information *Description*

This defines the interval between the individual data points in the data log, and thus the maximum loggable process time T_{log} :

- If 1 logging channel is used: $T_{log} = 1000 \times t_{log}$
- If 2 logging channels are used: $T_{log} = 500 \times t_{log}$
- If 3 logging channels are used: $T_{log} = 333 \times t_{log}$
- If 4 logging channels are used: $T_{log} = 250 \times t_{log}$

Once this time elapses, the oldest data points in the data log are cyclically overwritten such that a time of T_{\log} always remains in the memory (ring memory principle).

 The log contents are cleared if the length of the logging interval is changed.

Example

If 1 logging channel is used:

- $T_{\log} = 1000 \times 1 \text{ s} = 1 \text{ 000 s} \approx 15 \text{ min}$
- $T_{\log} = 1000 \times 10 \text{ s} = 10 \text{ 000 s} \approx 3 \text{ h}$
- $T_{\log} = 1000 \times 80 \text{ s} = 80 \text{ 000 s} \approx 1 \text{ d}$
- $T_{\log} = 1000 \times 3 \text{ 600 s} = 3 \text{ 600 000 s} \approx 41 \text{ d}$

Clear logging



Navigation

  Expert → Diagnostics → Data logging → Clear logging (0855)

Prerequisite

The **Extended HistoROM** application package is available.

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

Description

Use this function to clear the entire logging data.

Selection

- Cancel
- Clear data

Factory setting

Cancel

Additional information

Selection

- Cancel
The data is not cleared. All the data is retained.
- Clear data
The logging data is cleared. The logging process starts from the beginning.

Data logging



Navigation

  Expert → Diagnostics → Data logging → Data logging (0860)

Description

Use this function to select the data logging method.

Selection

- Overwriting
- Not overwriting

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 (→ 213), 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 (→ 214), 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 (→ 213), the **Not overwriting** option is selected.

Description Use this function to start and stop measured value logging.

Selection

- None
- Delete + start
- Stop

Factory setting None

Additional information *Selection*

- None
Initial measured value logging status.
- Delete + start
All the measured values recorded for all the channels are deleted and measured value logging starts again.
- Stop
Measured value logging is stopped.

Data log. status

Navigation Expert → Diagnostics → Data logging → Data log. status (0858)

Prerequisite In the **Data logging** parameter (→ 213), the **Not overwriting** option is selected.

Description Displays the measured value logging status.

User interface	<ul style="list-style-type: none"> ■ Done ■ Delay active ■ Active ■ Stopped
Factory setting	Done
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Done Measured value logging has been performed and completed successfully. ■ Delay active Measured value logging has been started but the logging interval has not yet elapsed. ■ Active The logging interval has elapsed and measured value logging is active. ■ Stopped Measured value logging is stopped.

Logging duration

Navigation	  Expert → Diagnostics → Data logging → Logging duration (0861)
Prerequisite	In the Data logging parameter (→  213), the Not overwriting option is selected.
Description	Displays the total logging duration.
User interface	Positive floating-point number
Factory setting	0 s

"Displ.channel 1" submenu

Navigation  Expert → Diagnostics → Data logging → Displ.channel 1



Display channel 1

Navigation	 Expert → Diagnostics → Data logging → Displ.channel 1
Prerequisite	The Extended HistoROM application package is available.  The software options currently enabled are displayed in the SW option overv. parameter (→  45).

One of the following options is selected in the **Assign chan. 1** parameter (→ 210):

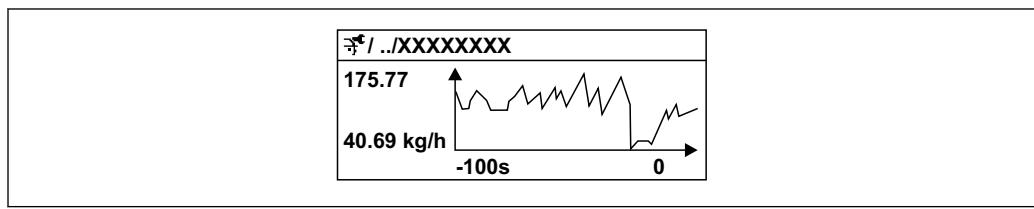
- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow^{*}
- Carrier mass fl.
- Density
- Ref.density
- Concentration^{*}
- Dynam. viscosity^{*}
- Kinematic visc.
- TempCompDynVisc^{*}
- TempCompKinVisc^{*}
- Carr. pipe temp.
- Electronic temp.
- Curr.output 1
- Osc. freq. 0
- Osc. freq. 1^{*}
- Freq. fluct. 0
- Freq. fluct. 1^{*}
- Oscil. amplitude^{*}
- Osc. ampl. 1^{*}
- Osc. damping 0
- Osc. damping 1^{*}
- Osc.damp.fluct 0
- Osc.damp.fluct 1^{*}
- Signal asymmetry
- Exc. current 0
- Exc. current 1^{*}

Description

Displays the measured value trend for the logging channel in the form of a chart.

Additional information

Description



A0016357

Fig. 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.

* Visibility depends on order options or device settings

"Displ.channel 2" submenu

Navigation

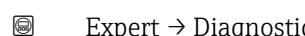


Expert → Diagnostics → Data logging → Displ.channel 2



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 → 215

"Displ.channel 3" submenu

Navigation

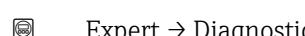


Expert → Diagnostics → Data logging → Displ.channel 3



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 → 215

"Displ.channel 4" submenu

Navigation



Expert → Diagnostics → Data logging → Displ.channel 4



Display channel 4

Navigation

 Expert → Diagnostics → Data logging → Displ.channel 4

Prerequisite

A process variable is defined in the **Assign chan. 4** parameter.

Description

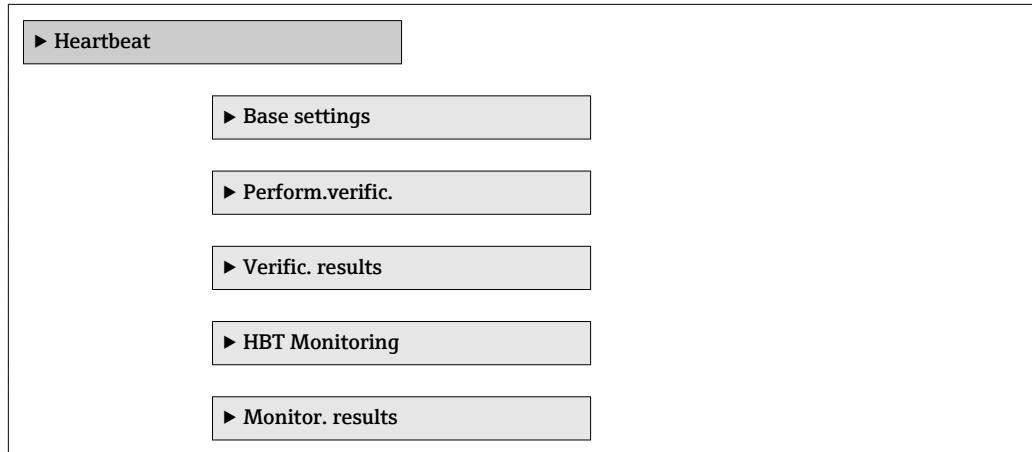
See the **Display channel 1** parameter →  215

3.8.12 "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

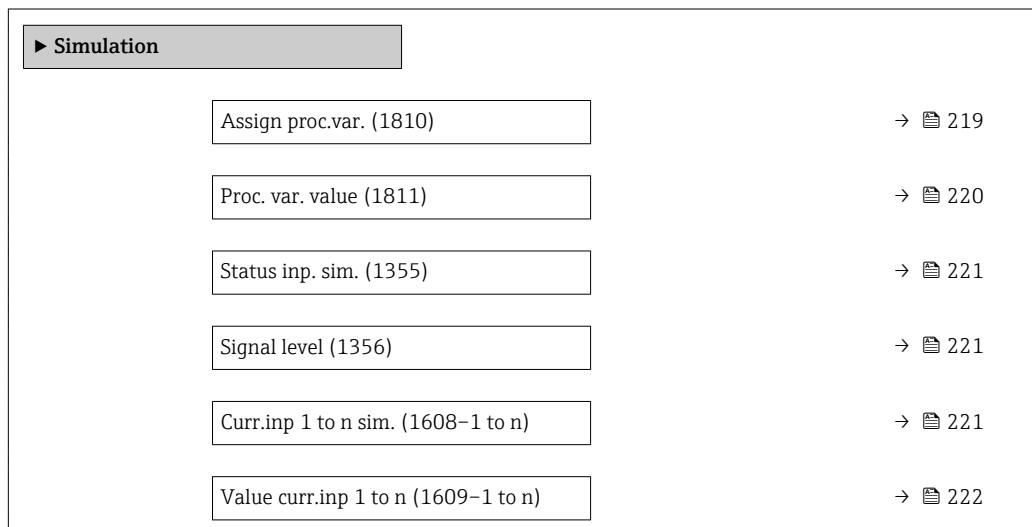
  Expert → Diagnostics → Heartbeat



3.8.13 "Simulation" submenu

Navigation

  Expert → Diagnostics → Simulation



Curr.out. 1 to n sim. (0354-1 to n)	→ 222
Value curr.out 1 to n (0355-1 to n)	→ 223
FreqOutputSim 1 to n (0472-1 to n)	→ 223
Freq value 1 to n (0473-1 to n)	→ 223
Puls.outp.sim. 1 to n (0458-1 to n)	→ 224
Pulse value 1 to n (0459-1 to n)	→ 224
Switch sim. 1 to n (0462-1 to n)	→ 225
Switch status 1 to n (0463-1 to n)	→ 225
Relay out. 1 to n sim (0802-1 to n)	→ 226
Switch status 1 to n (0803-1 to n)	→ 226
Dev. alarm sim. (0654)	→ 227
Event category (0738)	→ 227
Diag. event sim. (0737)	→ 227

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
- Dynam. viscosity *
- Kinematic visc.
- TempCompDynVisc *
- TempCompKinVisc *
- 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 (→ 220).

Proc. var. value



Navigation  Expert → Diagnostics → Simulation → Proc. var. value (1811)

Prerequisite A process variable is selected in the **Assign proc.var.** parameter (→ 219).

Description Use this function to enter a simulation value for the selected process variable. Subsequent measured value processing and the signal output use this simulation value. In this way, users can verify whether the measuring device has been configured correctly.

User entry Depends on the process variable selected

Factory setting 0

Additional information *User entry*

-  The unit of the displayed measured value is taken from the **System units** submenu (→ 61).

* Visibility depends on order options or device settings

Status inp. sim.**Navigation**

Expert → Diagnostics → Simulation → Status inp. sim. (1355)

Description

Use this function to switch simulation of the status input on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting

Off

Additional information*Description*

The desired simulation value is defined in the **Signal level** parameter (→ 221).

Selection

- Off
Simulation for the status input is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
Simulation for the status input is active.

Signal level**Navigation**

Expert → Diagnostics → Simulation → Signal level (1356)

Prerequisite

In the **Status inp. sim.** parameter (→ 221), the **On** option is selected.

Description

Use this function to select the signal level for the simulation of the status input. In this way, users can verify the correct configuration of the status input and the correct function of upstream feed-in units.

Selection

- High
- Low

Curr.inp 1 to n sim.**Navigation**

Expert → Diagnostics → Simulation → Curr.inp 1 to n sim. (1608–1 to n)

Description

Option for switching simulation of the current input on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

The desired simulation value is defined in the **Value curr.inp 1 to n** parameter.

Selection

- Off
- On

Factory setting	Off
Additional information	<i>Selection</i> <ul style="list-style-type: none">▪ 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	<p><i>Dependency</i></p> <p>The input range is dependent on the option selected in the Current span parameter (→ 114).</p>

FreqOutputSim 1 to n

Navigation	Expert → Diagnostics → Simulation → FreqOutputSim 1 to n (0472–1 to n)
Prerequisite	In the Operating mode parameter (→ 128), 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	<ul style="list-style-type: none"> ▪ Off ▪ On
Factory setting	Off
Additional information	<p><i>Description</i></p> <p> The desired simulation value is defined in the Freq value 1 to n parameter.</p> <p><i>Selection</i></p> <ul style="list-style-type: none"> ▪ 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	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 Expert → Diagnostics → Simulation → Puls.outp.sim. 1 to n (0458–1 to n)

Prerequisite In the **Operating mode** parameter (→ 128), 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	<ul style="list-style-type: none">▪ 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 (→ 131).
- Down-count. val.
The pulses specified in the **Pulse value** parameter (→ 224) 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 (→ 128), 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)

DescriptionUse this function to select the category of the diagnostic events that are displayed for the simulation in the **Diag. event sim.** parameter (→ 227).**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 (→ 227).

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
8	400
15	1300
15 FB	3600
25	3600
25 FB	9000
40	9000
40 FB	14000
50	14000
50 FB	36000
80	36000
100	60000
150	130 t/h
250	360 t/h
350	650 t/h

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
8	0.1
15	0.1
15 FB	1
25	1
25 FB	1
40	1
40 FB	10
50	10
50 FB	10
80	10
100	10
150	100
250	100
350	100

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
8	8
15	26
15 FB	72
25	72
25 FB	180
40	180
40 FB	300
50	300
50 FB	720
80	720
100	1200

Nominal diameter [mm]	On-value for liquid [kg/h]
150	2.6 t/h
250	7.2 t/h
350	13 t/h

Nominal diameter [mm]	Switch-on value for gas [kg/h]
1	0.02
2	0.1
4	0.45
8	2
15	6.5
15 FB	18
25	18
25 FB	45
40	45
40 FB	75
50	75
50 FB	180
80	180
100	300
150	650
250	1.8 t/h
350	3.25 t/h

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 ³
Corrected volume flow	Sft ³ /min
Density	lb/ft ³
Reference density	lb/Sft ³
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
3/8	15
1/2	50
1/2 FB	130
1	130
1 FB	330
1½	330
1½ FB	550
2	550
2 FB	1300
3	1300
4	2200
6	4800
10	13000
14	23500

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
3/8	0.2
1/2	0.2
1/2 FB	2
1	2
1 FB	2
1½	2
1½ FB	20
2	20
2 FB	20
3	20

Nominal diameter [in]	[lb/p]
4	20
6	200
10	200
14	200

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
3/8	0.3
1/2	1
1/2 FB	2.6
1	2.6
1 FB	6.6
1½	6.6
1½ FB	11
2	11
2 FB	26
3	26
4	44
6	95
10	260
14	470

Nominal diameter [in]	Switch-on value for gas [lb/min]
1/24	0.001
1/12	0.004
1/8	0.016
3/8	0.075
1/2	0.25
1/2 FB	0.65
1	0.65
1 FB	1.65
1½	1.65
1½ FB	2.75
2	2.75
2 FB	6.5

Nominal diameter [in]	Switch-on value for gas [lb/min]
3	6.5
4	11
6	23.75
10	65
14	117.5

5 Explanation of abbreviated units

5.1 SI units

Process variable	Units	Explanation
Density	g/cm ³ , g/m ³	Gram/volume unit
	kg/dm ³ , kg/l, kg/m ³	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 ³ , kg/Nl, g/Scm ³ , kg/Sm ³	Kilogram, gram/standard volume unit
Corrected volume	Nl, Nm ³ , Sm ³	Normal liter, normal cubic meter, standard cubic meter
Correct.vol.flow	Nl/s, Nl/min, Nl/h, Nl/d	Normal liter/time unit
	Nm ³ /s, Nm ³ /min, Nm ³ /h, Nm ³ /d	Normal cubic meter/time unit
	Sm ³ /s, Sm ³ /min, Sm ³ /h, Sm ³ /d	Standard cubic meter/time unit
Temperature	°C, K	Celsius, Kelvin
Volume	cm ³ , dm ³ , m ³	Cubic centimeter, cubic decimeter, cubic meter
	ml, l, hl, Ml Mega	Milliliter, liter, hectoliter, megaliter
Volume flow	cm ³ /s, cm ³ /min, cm ³ /h, cm ³ /d	Cubic centimeter/time unit
	dm ³ /s, dm ³ /min, dm ³ /h, dm ³ /d	Cubic decimeter/time unit
	m ³ /s, m ³ /min, m ³ /h, m ³ /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 ³ , 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 ³	Weight unit/standard volume unit
Corrected volume	Sft ³ , Sgal (us), Sbbl (us;liq.)	Standard cubic foot, standard gallon, standard barrel
Correct.vol.flow	Sft ³ /s, Sft ³ /min, Sft ³ /h, Sft ³ /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 ³	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 ³ /s, ft ³ /min, ft ³ /h, ft ³ /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
Time	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
	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)	Gallon, mega gallon
	bbl (imp;beer), bbl (imp;oil)	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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