

Description of Device Parameters

Proline Cubemass 300

PROFIBUS PA

Coriolis flowmeter

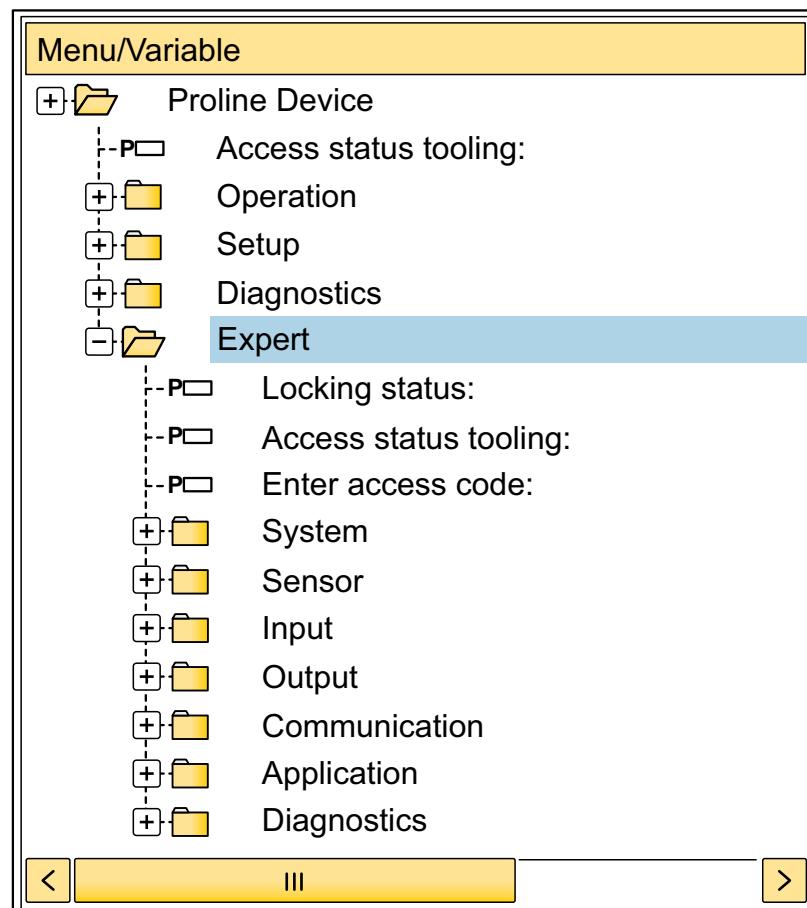


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1 About this document

1.1 Document function

The document is part of the Operating Instructions and serves as a reference for parameters, providing a detailed explanation of each individual parameter of the Expert operating menu.

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

- Commissioning measurements under difficult conditions
- Optimal adaptation of the measurement to difficult conditions
- Detailed configuration of the communication interface
- Error diagnostics in difficult cases

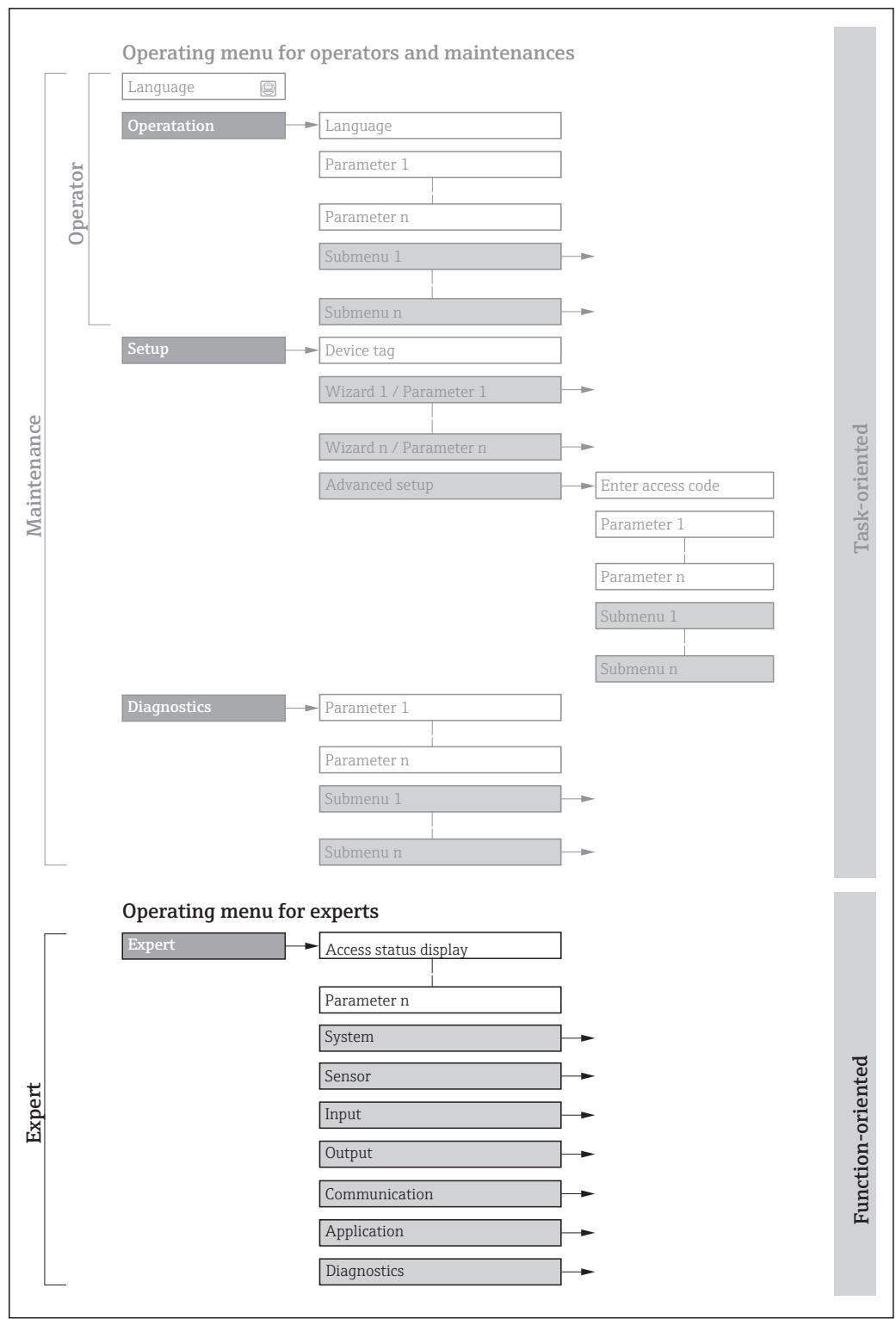
1.2 Target group

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

1.3 Using this document

1.3.1 Information on the document structure

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



1 Sample graphic for the schematic layout of the operating menu



Additional information regarding:

- The arrangement of the parameters according to the menu structure of the **Operation** menu, **Setup** menu, **Diagnostics** menu with a brief description: Operating Instructions → 7
- Operating concept of the operating menus: Operating Instructions → 7

1.3.2 Structure of a parameter description

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

Complete parameter name

Write-protected parameter = 

Navigation



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

Prerequisite

The parameter is only available under these specific conditions

Description

Description of the parameter function

Selection

List of the individual options for the parameter

- Option 1
- Option 2

User entry

Input range for the parameter

User interface

Display value/data for the parameter

Factory setting

Default setting ex works

Additional information

Additional explanations (e.g. in examples):

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

1.4 Symbols used

1.4.1 Symbols for certain types of information

| Symbol | Meaning |
|--------|---|
| | 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 |
|------------------|--------------------|
| Cubemass C 300 | BA01505D |

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 | SD01672D |
| Heartbeat Technology | SD01695D |
| Concentration measurement | SD01714D |

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 | → 27 |
| ▶ Diagn. handling | → 30 |
| ▶ Administration | → 40 |
| Sensor | → 45 |
| ▶ Measured val. | → 45 |
| ▶ System units | → 58 |
| ▶ Process param. | → 66 |
| ▶ Measurement mode | → 74 |
| ▶ External comp. | → 76 |
| ▶ Calculated value | → 79 |
| ▶ Sensor adjustm. | → 82 |
| ▶ Calibration | → 88 |
| I/O config. | → 90 |
| I/O 1 terminals (3902-1) | → 90 |
| I/O 1 info (3906-1) | → 90 |

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

| | |
|-------------------------|---------|
| ► Application | → ↗ 205 |
| ► Totalizer 1 to n | → ↗ 206 |
| ► Concentration | → ↗ 219 |
| ► Diagnostics | → ↗ 219 |
| Actual diagnos. (0691) | → ↗ 220 |
| Prev.diagnostics (0690) | → ↗ 221 |
| Time fr. restart (0653) | → ↗ 222 |
| Operating time (0652) | → ↗ 222 |
| ► Diagnostic list | → ↗ 222 |
| ► Event logbook | → ↗ 227 |
| ► Device info | → ↗ 229 |
| ► Mainboard module | → ↗ 232 |
| ► Sens. electronic | → ↗ 233 |
| ► I/O module 1 | → ↗ 234 |
| ► I/O module 2 | → ↗ 235 |
| ► Display module | → ↗ 236 |
| ► Min/max val. | → ↗ 237 |
| ► Data logging | → ↗ 243 |
| ► Heartbeat | → ↗ 252 |
| ► Simulation | → ↗ 253 |

3 Description of device parameters

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

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

Direct access



Navigation

Expert → Direct access (0106)

Description

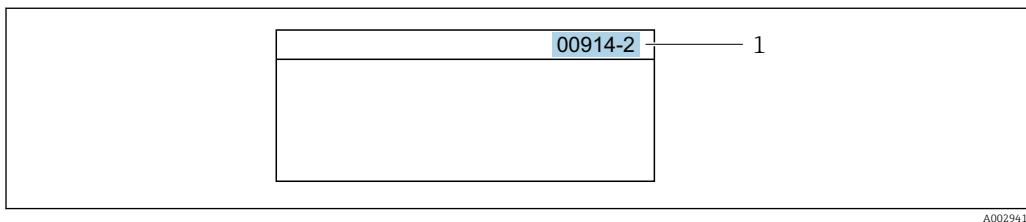
Use this function to enter the access code to enable direct access to the desired parameter via the local display. A parameter number is assigned to each parameter for this purpose.

User entry

0 to 65 535

Additional information*User entry*

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



1 *Direct access code*

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 (priority 2) | Write access to the parameters is temporarily locked on account of internal processes running in the device (e.g. data upload/download, reset etc.). Once the internal processing has been completed, the parameters can be changed once again. |

Access status

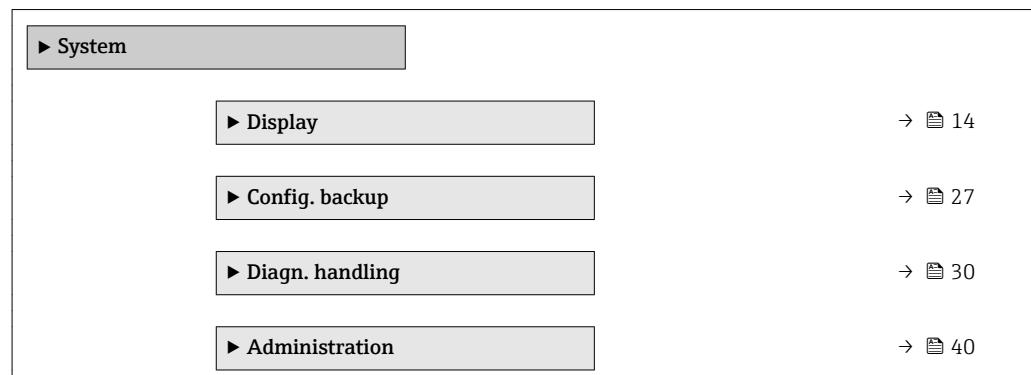
| | |
|-------------------------------|---|
| Navigation |   Expert → Access status (0005) |
| Description | Displays the access authorization to the parameters via the local display, Web browser or operating tool. |
| User interface | <ul style="list-style-type: none"> ▪ Operator ▪ Maintenance |
| Factory 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

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

Display language

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

Prerequisite A local display is provided.

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

Selection

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

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

Format display

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

Prerequisite A local display is provided.

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

Selection

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

Factory setting 1 value, max.

Additional information*Description*

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



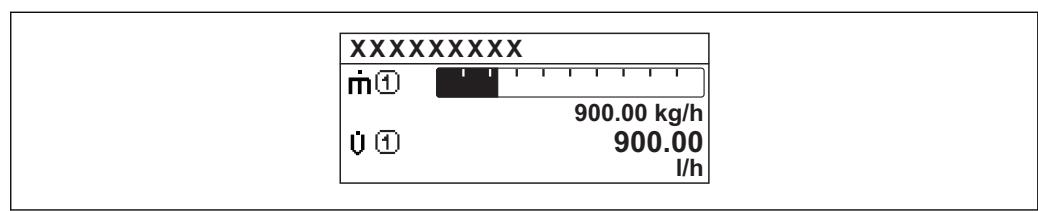
- The **Value 1 display** parameter (→ 18) to **Value 4 display** parameter (→ 23) are used to specify which measured values are shown on the local display and in what order.
- If more measured values are specified than the display mode selected permits, then the values alternate on the device display.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

Possible measured values shown on the local display:

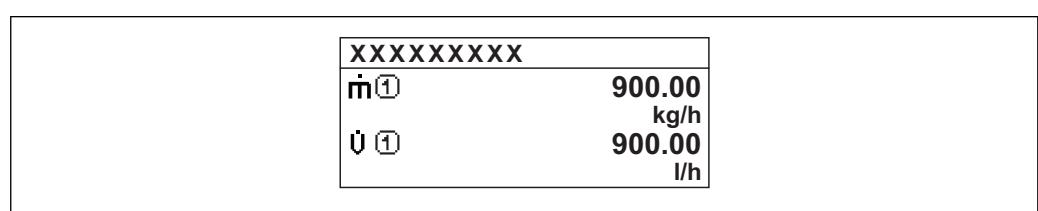
"1 value, max." option



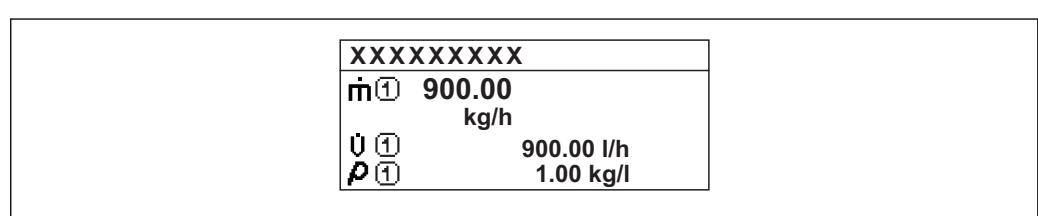
"Bagr. + 1 value" option



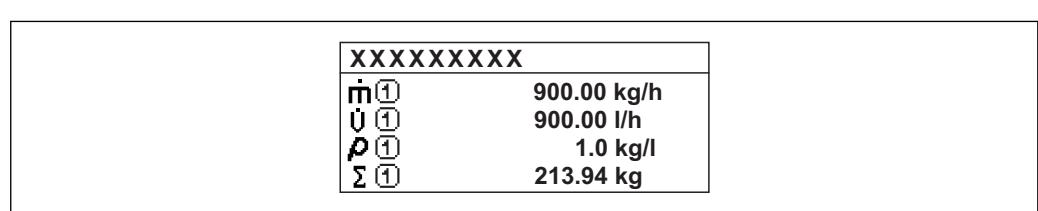
"2 values" option



"Val. large+2val." option



"4 values" option



Value 1 display

| | |
|------------------------|--|
| Navigation | Expert → System → Display → Value 1 display (0107) |
| Prerequisite | A local display is provided. |
| Description | Use this function to select one of the measured values to be shown on the local display. |
| Selection | <ul style="list-style-type: 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 *■ Concentration *■ Temperature■ Carr. pipe temp. *■ Electronic temp.■ Osc. freq. 0■ Osc. ampl. 0 *■ Freq. fluct. 0 *■ Osc. damping 0 *■ Osc.damp.fluct 0 *■ Signal asymmetry *■ Exc. current 0 *■ Totalizer 1■ Totalizer 2■ Totalizer 3■ Curr.output 1 *■ Pressure |
| Factory setting | Mass flow |

* Visibility depends on order options or device settings

Additional information*Description*

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



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

Dependency

The unit of the displayed measured value is taken from the **System units** submenu (→ 58).

Selection

- **Oscil. frequency** option

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

- **Oscil. amplitude** option

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

- **Oscil. damping** option

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

- **Signal asymmetry** option

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

0% bargraph 1**Navigation**

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

Prerequisite

A local display is provided.

Description

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

User entry

Signed floating-point number

Factory setting

Country-specific:

- 0 kg/h
- 0 lb/min

Additional information*Description*

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

User entry

The unit of the displayed measured value is taken from the **System units** submenu (→ 58).

100% bargraph 1



Navigation

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

Prerequisite

A local display is provided.

Description

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

User entry

Signed floating-point number

Factory setting

Depends on country and nominal diameter → [263](#)

Additional information

Description

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

User entry

The unit of the displayed measured value is taken from the **System units** submenu (→ [58](#)).

Decimal places 1



Navigation

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

Prerequisite

A measured value is specified in the **Value 1 display** parameter (→ [18](#)).

Description

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

Selection

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

Factory setting

X.XX

Additional information

Description

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

Value 2 display



Navigation

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

Prerequisite

A local display is provided.

| | |
|-------------------------------|---|
| Description | Use this function to select one of the measured values to be shown on the local display. |
| Selection | For the picklist, see the Value 1 display parameter (→ 18) |
| Factory setting | None |
| Additional information | <p><i>Description</i></p> <p>If several measured values are displayed at once, the measured value selected here will be the second value to be displayed. The value is only displayed during normal operation.</p> <p> The Format display parameter (→ 15) is used to specify how many measured values are displayed simultaneously and how.</p> <p><i>Dependency</i></p> <p> The unit of the displayed measured value is taken from the System units submenu (→ 58).</p> |

Decimal places 2



| | |
|-------------------------------|---|
| Navigation |  Expert → System → Display → Decimal places 2 (0117) |
| Prerequisite | A measured value is specified in the Value 2 display parameter (→ 20). |
| Description | Use this function to select the number of decimal places for measured value 2. |
| 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> |

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 1 display parameter (→ 18) |
| Factory setting | None |

Additional information*Description*

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

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

Selection

 The unit of the displayed measured value is taken from the **System units** submenu (→ 58).

0% bargraph 3**Navigation**

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

Prerequisite

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

Description

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

User entry

Signed floating-point number

Factory setting

Country-specific:

- 0 kg/h
- 0 lb/min

Additional information*Description*

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

User entry

 The unit of the displayed measured value is taken from the **System units** submenu (→ 58).

100% bargraph 3**Navigation**

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

Prerequisite

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

Description

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

User entry

Signed floating-point number

Factory setting

0

Additional information*Description*

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

User entry

The unit of the displayed measured value is taken from the **System units** submenu (→ 58).

Decimal places 3**Navigation**

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

Prerequisite

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

Description

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

Selection

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

Factory setting

X.XX

Additional information*Description*

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

Value 4 display**Navigation**

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

Prerequisite

A local display is provided.

Description

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

Selection

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

Factory setting

None

Additional information*Description*

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

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

Selection

 The unit of the displayed measured value is taken from the **System units** submenu (→ 58).

Decimal places 4**Navigation**

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

Prerequisite

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

Description

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

Selection

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

Factory setting

X.XX

Additional information*Description*

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

Display interval**Navigation**

 Expert → System → Display → Display interval (0096)

Prerequisite

A local display is provided.

Description

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

User entry

1 to 10 s

Factory setting

5 s

Additional information*Description*

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



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

Display damping**Navigation**

Expert → System → Display → Display damping (0094)

Prerequisite

A local display is provided.

Description

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

User entry

0.0 to 999.9 s

Factory setting

0.0 s

Additional information*User entry*

Use this function to enter a time constant (PT1 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

- Device tag
- Free text

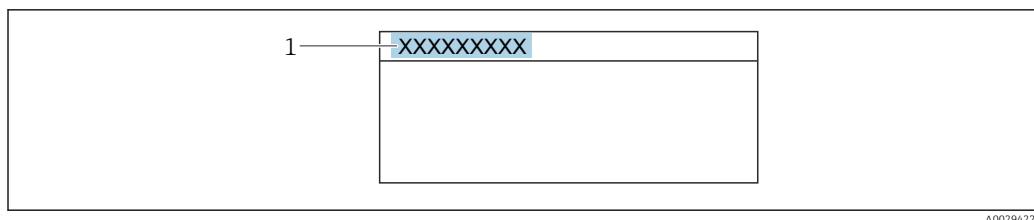
Factory setting

Device tag

Additional information*Description*

The header text only appears during normal operation.

1) proportional transmission behavior with first order delay



A0029422

1 Position of the header text on the display

Selection

- Device tag
Is defined in the **Device tag** parameter (→ 229).
- Free text
Is defined in the **Header text** parameter (→ 26).

Header text



Navigation

Expert → System → Display → Header text (0112)

Prerequisite

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

Description

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

User entry

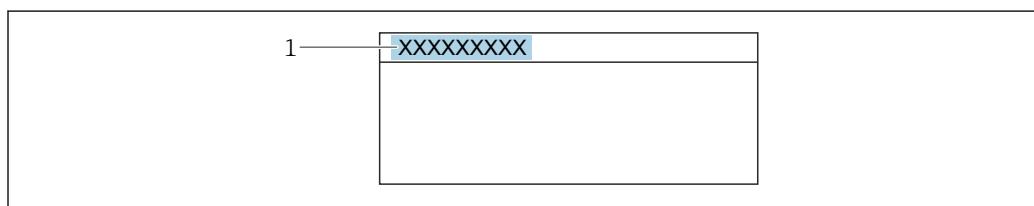
Max. 12 characters such as letters, numbers or special characters (e.g. @, %, /)

Factory setting

Additional information

Description

The header text only appears during normal operation.



A0029422

1 Position of the header text on the display

User entry

The number of characters displayed depends on the characters used.

Separator



Navigation

Expert → System → Display → Separator (0101)

Prerequisite

A local display is provided.

Description Use this function to select the decimal separator.

Selection

- . (point)
- , (comma)

Factory setting . (point)

Contrast display

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

Prerequisite A local display is provided.

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

User entry 20 to 80 %

Factory setting Depends on the display

Backlight

Navigation  Expert → System → Display → Backlight (0111)

Prerequisite One of the following conditions is met:

- Order code for "Display; operation", option **F** "4-line, illum.; touch control"
- Order code for "Display; operation", option **G** "4-line, illum.; touch control +WLAN"
- 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.

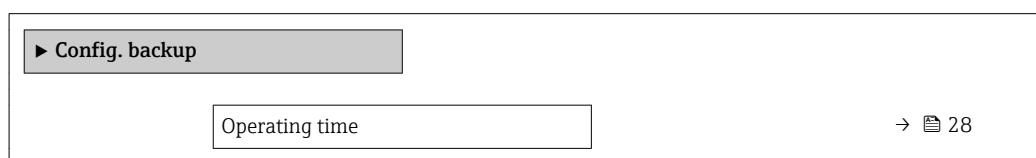
Selection

- Disable
- Enable

Factory setting Enable

3.1.2 "Configuration backup" submenu

Navigation  Expert → System → Config. backup



| | |
|------------------|-------|
| Last backup | → 28 |
| Config. managem. | → 28 |
| Backup state | → 29 |
| Compar. result | → 29 |

Operating time

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

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

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

Additional information *User interface*

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

Last backup

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

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

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

Config. managem.



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

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

Selection

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

Factory setting Cancel

* Visibility depends on order options or device settings

Additional information*Selection*

| 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 incomp.

Factory setting Check not done

Additional information *Description*

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

Selection

| Options | Description |
|-----------------|--|
| Set. identical | The current device configuration of the HistoROM is identical to the backup copy in the device memory. If the transmitter configuration of another device has been transmitted to the device via HistoROM in the 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 incomp. | The backup copy in the device memory is not compatible with the device. |

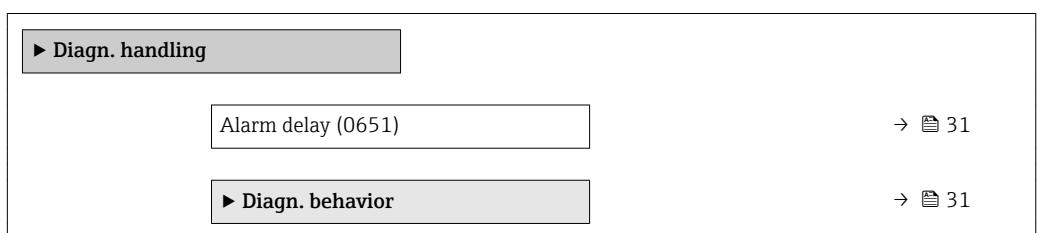
HistoROM

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

3.1.3 "Diagn. handling" submenu

Navigation

Expert → System → Diagn. handling



Alarm delay**Navigation**

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

Description

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



The diagnostic message is reset without a time delay.

User entry

0 to 60 s

Factory setting

0 s

Additional information*Result*

This setting affects the following diagnostic messages:

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

"Diagn. behavior" submenu

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

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

| Diagnostic behavior | Description |
|---------------------|---|
| Alarm | The device stops measurement. The totalizers assume the defined alarm condition. A diagnostic message is generated. |
| Warning | The device continues to measure. The measured value output via PROFIBUS and the totalizers are not affected. A diagnostic message is generated. |
| Logbook only | The device continues to measure. The diagnostic message is displayed only in the Event logbook submenu (→ 227) (Event list submenu (→ 228)) and not in alternation with the operational display. |
| Off | The diagnostic event is ignored, and no diagnostic message is generated or entered. |



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

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

| ► Diagn. behavior | |
|---------------------------|--|
| Diagnostic no. 046 (0709) | →  33 |
| Diagnostic no. 140 (0708) | →  33 |
| Diagnostic no. 144 (0731) | →  33 |
| Diagnostic no. 374 (0710) | →  34 |
| Diagnostic no. 302 (0739) | →  34 |
| Diagnostic no. 441 (0657) | →  34 |
| Diagnostic no. 442 (0658) | →  35 |
| Diagnostic no. 443 (0659) | →  35 |
| Diagnostic no. 444 (0740) | →  35 |
| Diagnostic no. 830 (0800) | →  36 |
| Diagnostic no. 831 (0641) | →  36 |
| Diagnostic no. 832 (0681) | →  36 |
| Diagnostic no. 833 (0682) | →  37 |
| Diagnostic no. 834 (0700) | →  37 |
| Diagnostic no. 835 (0702) | →  37 |
| Diagnostic no. 842 (0638) | →  38 |
| Diagnostic no. 862 (0679) | →  38 |
| Diagnostic no. 912 (0703) | →  38 |
| Diagnostic no. 913 (0712) | →  39 |
| Diagnostic no. 944 (0732) | →  39 |
| Diagnostic no. 948 (0744) | →  40 |

Diagnostic no. 046 (Sensor limit)

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

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

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: |

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

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

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

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

Additional information

Detailed description of the options available for selection:

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

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

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

- Alarm
- Warning

Factory setting

Warning

Additional information

Detailed description of the options available for selection:

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

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

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

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

Additional information

Detailed description of the options available for selection:

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

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

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

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:**Diagnostic no. 830 (Sensor temp.)****Navigation**  Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 830 (0800)**Description**Option for changing the diagnostic behavior of the diagnostic message **830 Sensor temp..****Selection**

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

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

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

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

| | |
|------------------|--|
| 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: |
|-------------------------------|--|

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: |
|-------------------------------|--|

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: |
|-------------------------------|--|

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

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

Additional information

Detailed description of the options available for selection:

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

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

DescriptionOption for changing the diagnostic behavior of the diagnostic message **Process limit**.**Selection**

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Off

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

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

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

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

Additional information

Detailed description of the options available for selection:

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

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

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

| | |
|------------------|--|
| 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: |
|-------------------------------|--|

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 | <ul style="list-style-type: none">■ Off■ Alarm■ Warning■ Logbook only |
|------------------|--|

| | |
|------------------------|---------|
| Factory setting | Warning |
|------------------------|---------|

| | |
|-------------------------------|--|
| Additional information |  Detailed description of the options available for selection: |
|-------------------------------|--|

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 | <ul style="list-style-type: none">■ Off■ Alarm■ Warning■ Logbook only |
|------------------|--|

| | |
|------------------------|---------|
| Factory setting | Warning |
|------------------------|---------|

| | |
|-------------------------------|--|
| Additional information |  Detailed description of the options available for selection: |
|-------------------------------|--|

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

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

Description

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

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

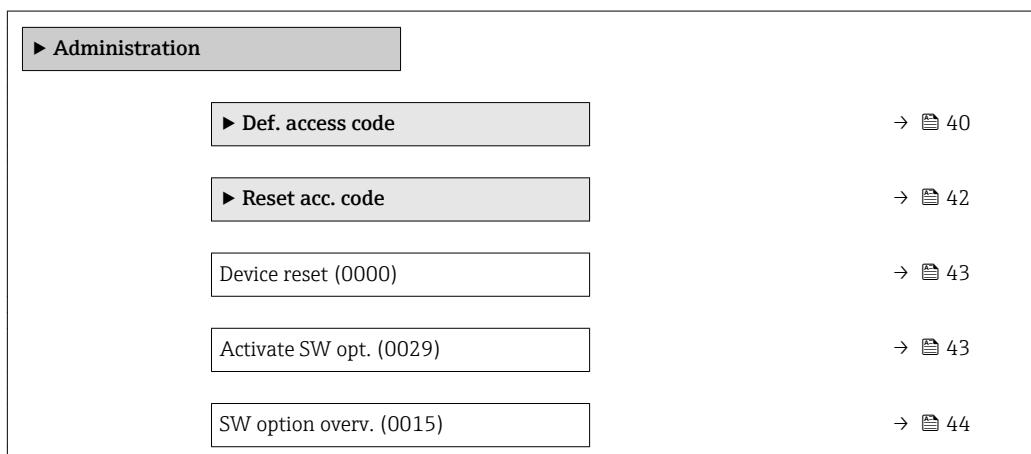
Additional information

Detailed description of the options available for selection:

3.1.4 "Administration" submenu

Navigation

Expert → System → Administration



"Def. access code" wizard

The **Def. access code** wizard (→ 40) is only available when operating via the local display or Web browser.

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

Navigation

Expert → System → Administration → Def. access code

► Def. access code

Def. access code

→ 41

Confirm code

→ 41

Def. access code**Navigation**

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

Description

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

User entry

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

Additional information*Description*

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

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

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

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

User entry

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

Factory setting

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

Confirm code**Navigation**

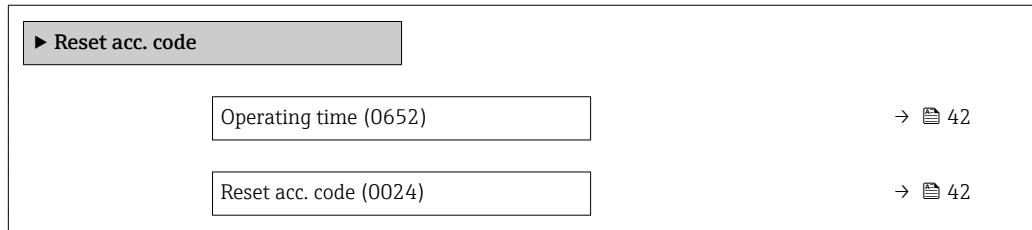
Expert → System → Administration → Def. access code → Confirm code

Description

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

User entry

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

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

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

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

User interface

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

Additional information*User interface*

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

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

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

User entry

Character string comprising numbers, letters and special characters

Factory setting

0x00

Additional information*Description*

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

User entry

The reset code can only be entered via:

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

Additional parameters in the "Administration" submenu

Device reset**Navigation**

Expert → System → Administration → Device reset (0000)

Description

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

Selection

- Cancel
- To delivery set.
- Restart device
- Rest.S-DATBackup *

Factory setting

Cancel

Additional information

Selection

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

Activate SW opt.**Navigation**

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

Description

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

User entry

Max. 10-digit string consisting of numbers.

Factory setting

Depends on the software option ordered

* Visibility depends on order options or device settings

Additional information**Description**

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

User entry

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

NOTE!

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

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

- Before you enter a new activation code, make a note of the current activation code .
- Enter the new activation code provided by Endress+Hauser when the new software option was ordered.
- Once the activation code has been entered, check if the new software option is displayed in the **SW option overv.** parameter (→  44).
- ↳ The new software option is active if it is displayed.
- ↳ If the new software option is not displayed or all software options have been deleted, the code entered was either incorrect or invalid.
- If the code entered is incorrect or invalid, enter the old activation code .
- Have your Endress+Hauser sales organization check the new activation code remembering to specify the serial number or ask for the code again.

Example for a software option

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

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

Web browser

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

SW option overv.**Navigation**

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

Description

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

User interface

- Extend. HistoROM *
- HBT Monitoring *
- HBT Verification *
- Concentration *

* Visibility depends on order options or device settings

Additional information*Description*

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

"Extend. HistoROM" option

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

"HBT Verification" option and "HBT Monitoring" option

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

"Concentration" option

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

3.2 "Sensor" submenu

Navigation
 Expert → Sensor

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

3.2.1 "Measured val." submenu

Navigation
 Expert → Sensor → Measured val.

| | |
|--------------------------|--|
| ► Measured val. | |
| ► Process variab. | →  46 |
| ► Totalizer | →  52 |

| | |
|------------------------|-------|
| ► Input values | → 53 |
| ► Output values | → 54 |

"Process variab." submenu*Navigation*

Expert → Sensor → Measured val. → Process variab.

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

Mass flow

Navigation

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

Description

Displays the mass flow that is currently measured.

User interface

Signed floating-point number

Additional information*Dependency*

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

Volume flow

Navigation

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

Description

Displays the volume flow currently calculated.

User interface

Signed floating-point number

Additional information*Description*

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

Dependency

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

Correct.vol.flow

Navigation

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

Description

Displays the corrected volume flow currently measured.

User interface

Signed floating-point number

Additional information*Dependency*

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

Density

Navigation

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

Description

Displays the density currently measured.

User interface

Signed floating-point number

Additional information*Dependency*

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

Ref.density

| | |
|-------------------------------|--|
| 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 | <i>Dependency</i>  The unit is taken from the Ref. dens. unit parameter (→ 64) |

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 | <i>Dependency</i>  The unit is taken from the Temperature unit parameter (→ 64) |

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 (→ 65) |

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 (→ 44). |

Description Displays the concentration currently calculated.

User interface Signed floating-point number

Additional information *Dependency*

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

Target mass flow

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

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

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

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

User interface Signed floating-point number

Additional information *Dependency*

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

Carrier mass fl.

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

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

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

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

User interface Signed floating-point number

Additional information *Dependency*

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

Targ.corr.vol.fl

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

Prerequisite

With the following conditions:

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

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

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

User interface Signed floating-point number

Additional information *Dependency*

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

Carr.corr.vol.fl

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

Prerequisite

With the following conditions:

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

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

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

User interface Signed floating-point number

Additional information *Dependency*

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

Target vol. flow

| | |
|-------------------------------|--|
| Navigation |   Expert → Sensor → Measured val. → Process variab. → Target vol. flow (1895) |
| Prerequisite | With the following conditions: <ul style="list-style-type: none">▪ 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. <p> The software options currently enabled are displayed in the SW option overv. parameter (→  44).</p> |
| Description | Displays the volume flow currently measured for the target medium. |
| User interface | Signed floating-point number |
| Additional information | <i>Dependency</i>  The unit is taken from the Volume flow unit parameter (→  60) |

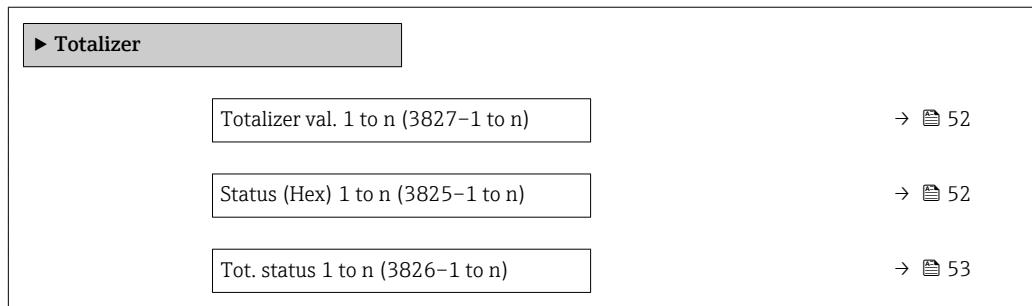
Carrier vol. fl.

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

"Totalizer" submenu

Navigation

Expert → Sensor → Measured val. → Totalizer



Totalizer val. 1 to n

Navigation

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

Prerequisite

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

Description

Displays the current reading for totalizer 1-3.

User interface

Signed floating-point number

Additional information

Description

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

User interface

The value of the process variable totalized since measuring began can be positive or negative. This depends on the settings in the **Operation mode** parameter (→ 209).

Dependency

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

Status (Hex) 1 to n

Navigation

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

Prerequisite

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

Description

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

User interface

0 to 0xFF

Tot. status 1 to n

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

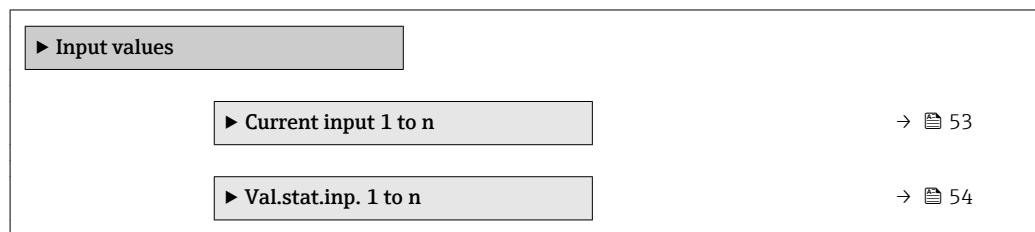
Description Displays the status of the particular totalizer.

User interface

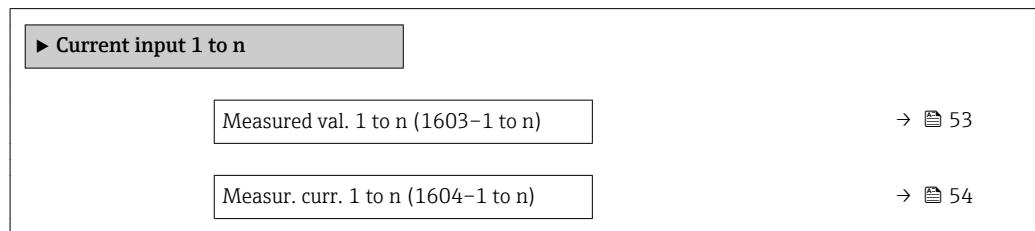
- Good
- Uncertain
- Bad

"Input values" submenu

Navigation Expert → Sensor → Measured val. → Input values

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

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

**Measured val. 1 to n**

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

Description Displays the current input value.

User interface Signed floating-point number

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

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

Description

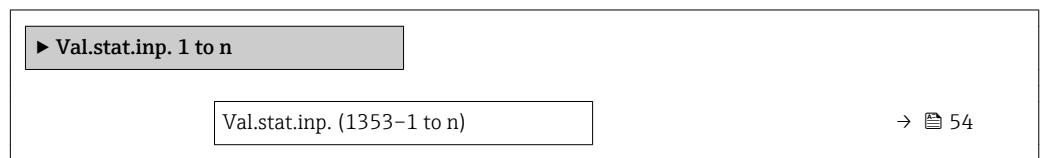
Displays the current value of the current input.

User interface

0 to 22.5 mA

*"Value status input 1 to n" submenu**Navigation*

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

**Val.stat.inp.****Navigation**

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

Description

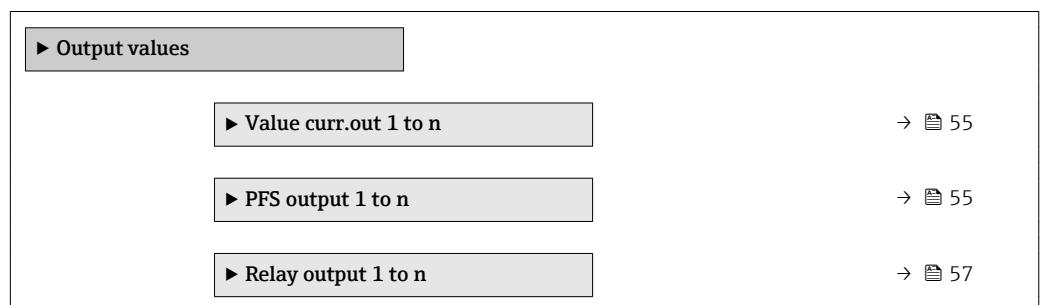
Displays the current input signal level.

User interface

- High
- Low

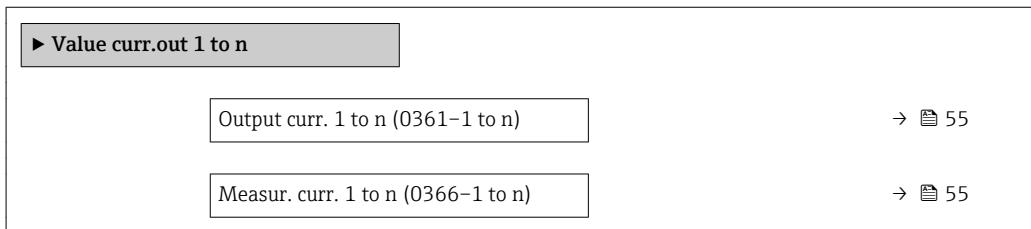
*"Output values" submenu**Navigation*

Expert → Sensor → Measured val. → Output values



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

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

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

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

Description

Displays the current value currently calculated for the current output.

User interface

0 to 22.5 mA

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

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

Description

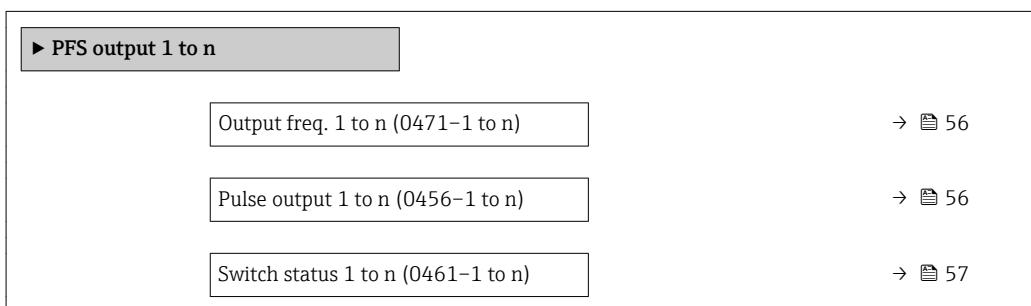
Use this function to display the actual measured value of the output current.

User interface

0 to 30 mA

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

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

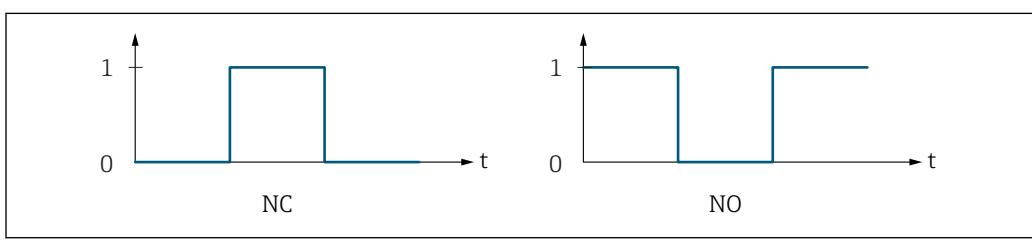


Output freq. 1 to n

| | |
|-----------------------|---|
| 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 (→ 114), 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 (→ 114) 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. |



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

The output behavior can be reversed via the **Invert outp.sig.** parameter (→ 132) i.e. the transistor does not conduct for the duration of the pulse.

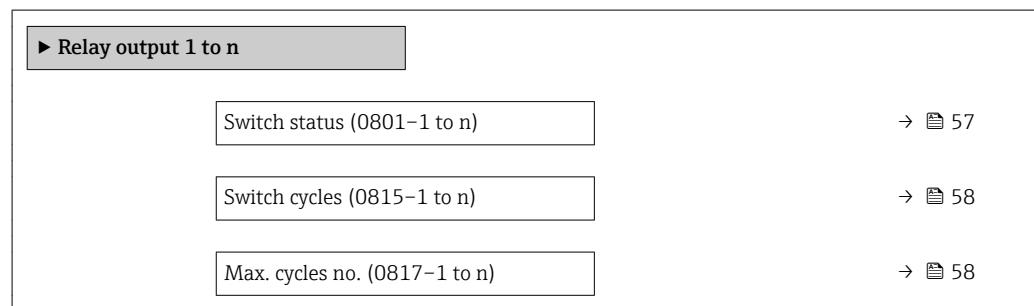
In addition, the behavior of the output in the event of a device alarm (**Failure mode** parameter (→ 118)) can be configured.

Switch status 1 to n

| | |
|-------------------------------|---|
| 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 (→ 114). |
| 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

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

| | |
|-------------------------|----------------------|
| Pressure unit (0564) | → 65 |
| Date/time format (2812) | → 66 |

Mass flow unit



Navigation

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

Description

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

Selection

SI units

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

US units

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

Factory setting

Country-specific:

- kg/h
- lb/min

Additional information

Result

The selected unit applies for:

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

Selection

For an explanation of the abbreviated units: → [266](#)

Mass unit



Navigation

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

Description

Use this function to select the unit for the mass.

Selection

SI units

- g
- kg
- t

US units

- oz
- lb
- STon

Factory setting

Country-specific:

- kg
- lb

Additional information*Selection*

For an explanation of the abbreviated units: → 266

Volume flow unit**Navigation**

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

Description

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

Selection*SI units*

- cm³/s
- cm³/min
- cm³/h
- cm³/d
- dm³/s
- dm³/min
- dm³/h
- dm³/d
- m³/s
- m³/min
- m³/h
- m³/d
- ml/s
- ml/min
- ml/h
- ml/d
- l/s
- l/min
- l/h
- l/d
- hl/s
- hl/min
- hl/h
- hl/d
- Ml/s
- Ml/min
- Ml/h
- Ml/d

US units

- af/s
- af/min
- af/h
- af/d
- ft³/s
- ft³/min
- ft³/h
- ft³/d
- fl oz/s (us)
- fl oz/min (us)
- fl oz/h (us)
- fl oz/d (us)
- gal/s (us)
- gal/min (us)
- gal/h (us)
- gal/d (us)
- kgal/s (us)
- kgal/min (us)
- kgal/h (us)
- kgal/d (us)
- Mgal/s (us)
- Mgal/min (us)
- Mgal/h (us)
- Mgal/d (us)
- bbl/s (us;oil)
- bbl/min (us;oil)
- bbl/h (us;oil)
- bbl/d (us;oil)
- bbl/s (us;tank)
- bbl/min (us;tank)
- bbl/h (us;tank)
- bbl/d (us;tank)

Imperial units

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

or

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

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

* Visibility depends on order options or device settings

Factory setting

Country-specific:

- l/h
- gal/min (us)

Additional information

Result

The selected unit applies for:

Volume flow parameter (→  47)

Selection

 For an explanation of the abbreviated units: →  266

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) *

* Visibility depends on order options or device settings

Factory setting

Country-specific:

- l
- gal (us)

Additional information*Selection*

For an explanation of the abbreviated units: → [266](#)

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
- Sft³/min

Additional information*Result*

The selected unit applies for:

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

Selection

For an explanation of the abbreviated units: → [266](#)

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
- Sft³

Additional information*Selection*

For an explanation of the abbreviated units: → [266](#)

**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 *

* Visibility depends on order options or device settings

or

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

* Visibility depends on order options or device settings

Factory setting

Country-specific:

- kg/l
- lb/ft³

Additional information*Result*

The selected unit applies for:

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

Selection

- SD = specific density

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

- SG = specific gravity

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

 For an explanation of the abbreviated units: → [266](#)

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

Selection

 For an explanation of the abbreviated units: → [266](#)

Temperature unit**Navigation**

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

Description

Use this function to select the unit for the temperature.

| Selection | <i>SI units</i> | <i>US units</i> |
|-----------------|---|--|
| | <ul style="list-style-type: none"> ■ °C ■ K | <ul style="list-style-type: none"> ■ °F ■ °R |
| Factory setting | Country-specific: | |

| | |
|-----------------|--|
| Factory setting | Country-specific: |
| | <ul style="list-style-type: none"> ■ °C ■ °F |

| Additional information | <i>Result</i> |
|------------------------|---|
| | The selected unit applies for: |
| | <ul style="list-style-type: none"> ■ Maximum value parameter (→ 239) ■ Minimum value parameter (→ 238) ■ Maximum value parameter (→ 239) ■ Minimum value parameter (→ 239) ■ Maximum value parameter (→ 240) ■ Minimum value parameter (→ 240) ■ External temp. parameter (→ 78) ■ Temperature parameter (→ 48) ■ Ref. temperature parameter (→ 80) |

Selection

 For an explanation of the abbreviated units: → 266

Pressure unit

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

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

| Selection | <i>SI units</i> | <i>US units</i> |
|-----------------|--|--|
| | <ul style="list-style-type: none"> ■ Pa a ■ kPa a ■ MPa a ■ bar ■ Pa g ■ kPa g ■ MPa g ■ bar g | <ul style="list-style-type: none"> ■ psi a ■ psi g |
| Factory setting | Country-specific: | |
| | <ul style="list-style-type: none"> ■ bar a ■ psi a | |

| Factory setting | Country-specific: |
|-----------------|--|
| | <ul style="list-style-type: none"> ■ bar a ■ psi a |

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

Selection

 For an explanation of the abbreviated units: → 266

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: → [266](#)

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

Expert → Sensor → Process param.

| ► Process param. | |
|------------------------|----------------------|
| Flow damping (1802) | → 66 |
| Density damping (1803) | → 67 |
| Temp. damping (1822) | → 67 |
| Flow override (1839) | → 68 |
| ► Low flow cut off | → 68 |
| ► Partial pipe det | → 71 |

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
- Low flow cut off →  68
- Totalizers →  206

Density damping



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

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

User entry 0 to 999.9 s

Factory setting 0 s

Additional information *Description*

 The damping is performed by a PT1 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.

2) Proportional behavior with first-order lag

3) Proportional behavior with first-order lag

User entry 0 to 999.9 s

Factory setting 0 s

Additional information *Description*

i The damping is performed by a PT1 element⁴⁾.

User entry

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

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

Flow override



Navigation

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

Description

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

Selection

- Off
- On

Factory setting

Off

Additional information *Description*

Flow override is active

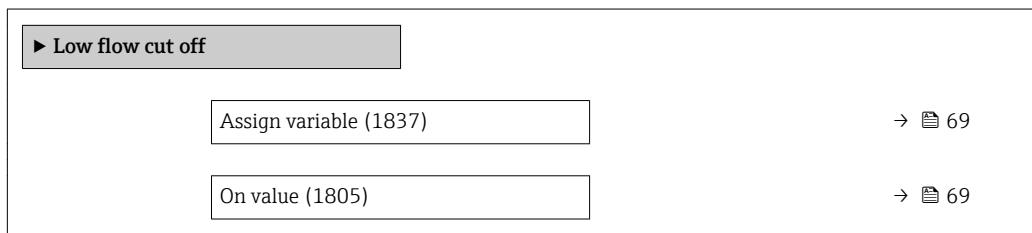
- The diagnostic message diagnostic message **△C453 Flow override** is displayed.
- Output values
 - Temperature: continues to be output
 - Totalizers 1-3: stop being totalized

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

"Low flow cut off" submenu

Navigation

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



4) Proportional behavior with first-order lag

| | |
|-------------------------|----------------------|
| Off value (1804) | → 69 |
| Pres. shock sup. (1806) | → 70 |

Assign variable

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

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

Selection

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

Factory setting Mass flow

On value

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

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

Description Use this function to enter a switch-on value for low flow cut off. Low flow cut off is activated if the value entered is not equal to 0 → [69](#).

User entry Positive floating-point number

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

Additional information

Dependency

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

Off value

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

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

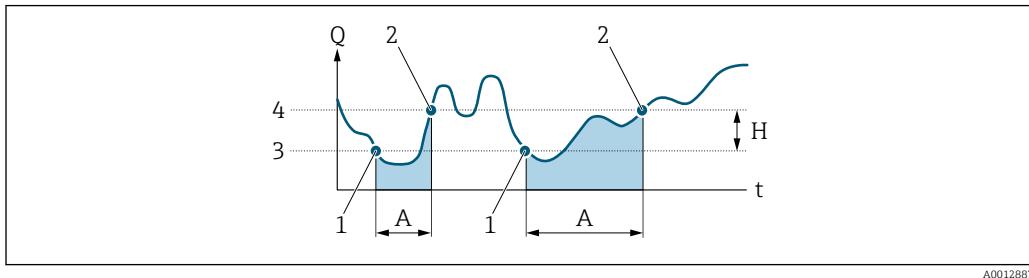
Description Use this function to enter a switch-off value for low flow cut off. The off value is entered as a positive hysteresis from the on value → [69](#).

* Visibility depends on order options or device settings

User entry 0 to 100.0 %

Factory setting 50 %

Additional information *Example*



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

Pres. shock sup.



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

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

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

User entry 0 to 100 s

Factory setting 0 s

Additional information *Description*

Pressure shock suppression is enabled

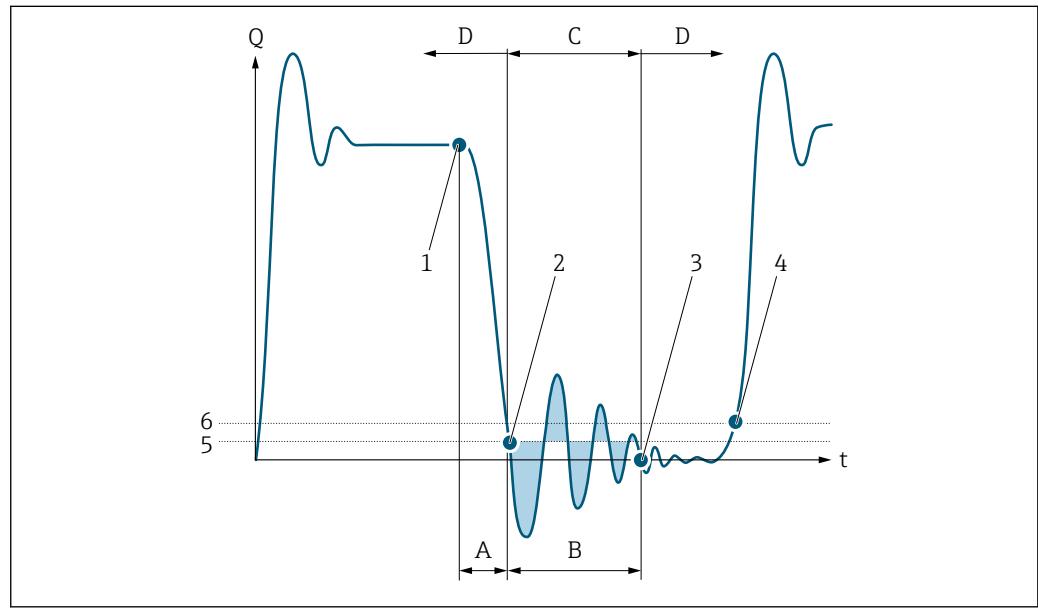
- Prerequisite:
 - Flow rate < on-value of low flow cut off
 - or
 - Changing the flow direction
- Output values
 - Flow displayed: 0
 - Totalizer: the totalizers are pegged at the last correct value

Pressure shock suppression is disabled

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

Example

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



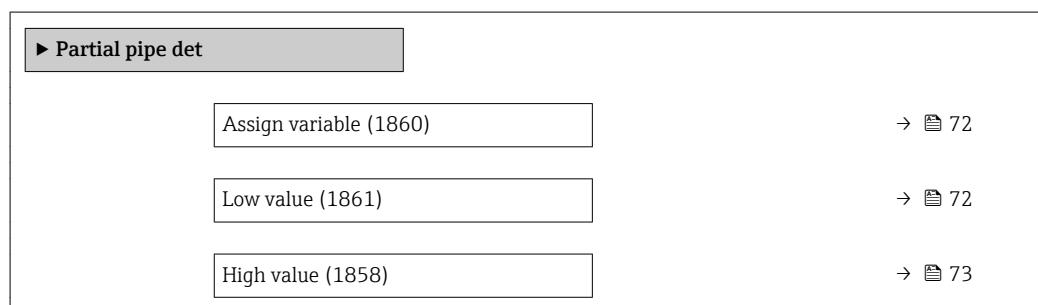
A0012888

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

"Partial pipe det" submenu

Navigation

Expert → Sensor → Process param. → Partial pipe det



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

Assign variable



Navigation

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

Description

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

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

Selection

- Off
- Density
- Ref.density

Factory setting

Off

Low value



Navigation

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

Prerequisite

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

Description

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

User entry

Signed floating-point number

Factory setting

200

Additional information

User entry

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

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

Limit value

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

High value

| | |
|-------------------------------|--|
| Navigation | Expert → Sensor → Process param. → Partial pipe det → High value (1858) |
| Prerequisite | A process variable is selected in the Assign variable parameter (→ 72). |
| Description | Use this function to enter an upper limit value to enable detection of empty or partially filled measuring tubes. If the measured density exceeds this value, detection is enabled. |
| User entry | Signed floating-point number |
| Factory setting | 6 000 |
| Additional information | <p><i>User entry</i></p> <p>The upper limit value must be greater than the lower limit value defined in the Low value parameter (→ 72).</p> <p> The unit depends on the process variable selected in the Assign variable parameter (→ 72).</p> <p><i>Limit value</i></p> <p> If the displayed value is outside the limit value, the measuring device displays the diagnostic message △S862 Partly filled.</p> |

Response time

| | |
|------------------------|--|
| Navigation | Expert → Sensor → Process param. → Partial pipe det → Response time (1859) |
| Prerequisite | A process variable is selected in the Assign variable parameter (→ 72). |
| Description | Use this function to enter the minimum length of time (debouncing time) the signal must be present for the diagnostic message △S862 Partly filled to be triggered if the measuring pipe is empty or partially full. |
| User entry | 0 to 100 s |
| Factory setting | 1 s |

Max. damping

| | |
|------------------------|--|
| Navigation | Expert → Sensor → Process param. → Partial pipe det → Max. damping (6040) |
| Description | Use this function to enter a damping value to enable detection of empty or partially filled measuring tubes. |
| User entry | Positive floating-point number |
| Factory setting | 0 |

Additional information**Description**

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

User entry

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

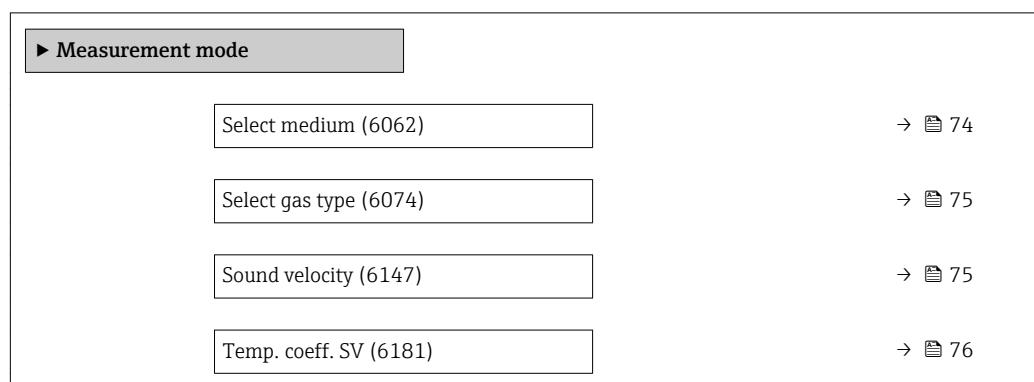
Example

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

3.2.4 "Measurement mode" submenu

Navigation

Expert → Sensor → Measurement mode



Select medium

**Navigation**

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

Description

Use this function to select the type of medium.

Selection

- Liquid
- Gas

Factory setting

Liquid

Select gas type

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

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

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

Selection

- Air
- Ammonia NH₃
- Argon Ar
- Sulf. hex.fl.SF₆
- Oxygen O₂
- Ozone O₃
- Nitrog. ox. NO_x
- 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 (→ 75), the **Others** option is selected.

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

User entry 1 to 99 999.9999 m/s

Factory setting 415.0 m/s

Temp. coeff. SV**Navigation**

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

Prerequisite

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

Description

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

User entry

Positive floating-point number

Factory setting

0 (m/s)/K

3.2.5 "External comp." submenu*Navigation*

Expert → Sensor → External comp.

| External comp. | |
|-------------------------|----------------------|
| Pressure compen. (6130) | → 76 |
| Pressure value (6059) | → 77 |
| External press. (6209) | → 77 |
| Temp.corr.source (6184) | → 78 |
| External temp. (6080) | → 78 |

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 *

Factory setting

Off

* Visibility depends on order options or device settings

Additional information*Selection*

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



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

Pressure value**Navigation**

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

Prerequisite

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

Description

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

User entry

Positive floating-point number

Factory setting

0 bar

Additional information*User entry*

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

External press.**Navigation**

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

Prerequisite

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

Description

Use this function to enter an external pressure value.

User interface

Positive floating-point number

Factory setting

0 bar

Additional information*User entry*

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

Temp.corr.source

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

Description Use this function to select the temperature mode.

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

Factory setting Internal value

Additional information *Description*
Use this function to select the type of temperature compensation.

Selection

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

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

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

External temp.

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

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

Description Use this function to enter the external temperature.

User interface -273.15 to 99 999 °C

Factory setting Country-specific:

- 0 °C
- +32 °F

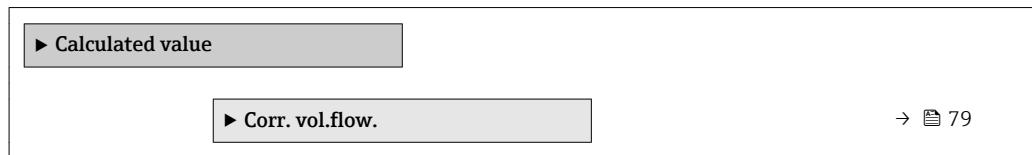
Additional information *Description*
 The unit is taken from the **Temperature unit** parameter (→ 64)

* Visibility depends on order options or device settings

3.2.6 "Calculated value" submenu

Navigation

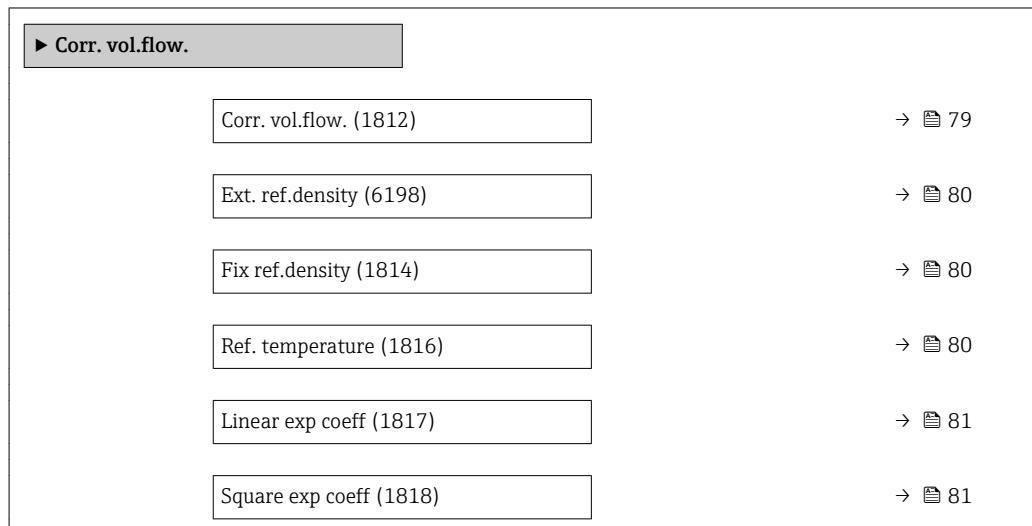
Expert → Sensor → Calculated value



"Corr. vol.flow." submenu

Navigation

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



Corr. vol.flow.



Navigation

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

Description

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

Selection

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

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 internally or read into the device from an external source → 76 → 76) and density

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

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) |
| 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 (→  64) |

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 (→  79) 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 (→  64) |

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 (→  79) 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 | <i>Dependency</i> |
|-------------------------------|-------------------|

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

Reference density calculation

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

A0023403

- 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 (→ 79) parameter. |
| Description | Use this function to enter a linear, fluid-specific expansion coefficient for calculating the reference density. |
| User entry | Signed floating-point number |
| Factory setting | 0.0 1/K |

Square exp coeff

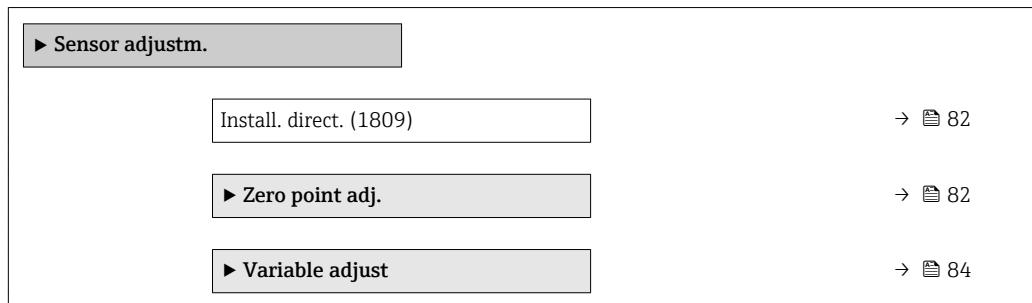


| | |
|------------------------|--|
| Navigation |  Expert → Sensor → Calculated value → Corr. vol.flow. → Square exp coeff (1818) |
| Prerequisite | The Calc ref density option is selected in the Corr. vol.flow. parameter (→ 79) parameter. |
| Description | For fluid with a non-linear expansion pattern: use this function to enter a quadratic, fluid-specific expansion coefficient for calculating the reference density. |
| User entry | Signed floating-point number |
| Factory setting | 0.0 1/K ² |

3.2.7 "Sensor adjustment" submenu

Navigation

Expert → Sensor → Sensor adjustm.



Install. direct.



Navigation

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

Description

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

Selection

- In arrow direct.
- Against arrow

Factory setting

In arrow direct.

Additional information

Description

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

"Zero point adj." submenu



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

Navigation

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

 ▶ Zero point adj.

Zero point adj. (6196)

→  83

Progress (2808)

→  83

Zero point adj.**Navigation**

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

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

Description

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

 Observe conditions →  82.

Selection

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

Factory setting

Cancel

Additional information*Description*

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

Progress**Navigation**

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

Description

The progress of the process is indicated.

User interface

0 to 100 %

* Visibility depends on order options or device settings

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

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

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

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

User entry

Signed floating-point number

Factory setting

0 kg/s

Additional information*Description*

 Corrected value = (factor × value) + offset

Mass flow factor

| | |
|-------------------------------|--|
| 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 | <i>Description</i> 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 m ³ /s. |
| User entry | Signed floating-point number |
| Factory setting | 0 m ³ /s |
| Additional information | <i>Description</i> 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 | <i>Description</i> Corrected value = (factor × value) + offset |

Density offset

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

Description Use this function to enter the zero point shift for the density trim. The density unit on which the shift is based is kg/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/Nm³.

User entry Signed floating-point number

Factory setting 0 kg/Nm³

Additional information *Description*

Corrected value = (factor × value) + offset

Ref.dens. factor

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

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

User entry Positive floating-point number

Factory setting 1

Additional information *Description*

Corrected value = (factor × value) + offset

Temp. offset**Navigation**

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

Description

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

User entry

Signed floating-point number

Factory setting

0 K

Additional information*Description*

Corrected value = (factor × value) + offset

Temp. factor**Navigation**

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

Description

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

User entry

Positive floating-point number

Factory setting

1

Additional information*Description*

Corrected value = (factor × value) + offset

3.2.8 "Calibration" submenu

Navigation

Expert → Sensor → Calibration

► Calibration

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

Cal. factor

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

Description Displays the current calibration factor for the sensor.

User interface Signed floating-point number

Factory setting Depends on nominal diameter and calibration.

Zero point



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

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

User entry Signed floating-point number

Factory setting Depends on nominal diameter and calibration.

Nominal diameter

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

Description Displays the nominal diameter of the sensor.

User interface DNxx / x"

Factory setting Depends on the size of the sensor

Additional information *Description*

 The value is also specified on the sensor nameplate.

C0 to 5

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

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

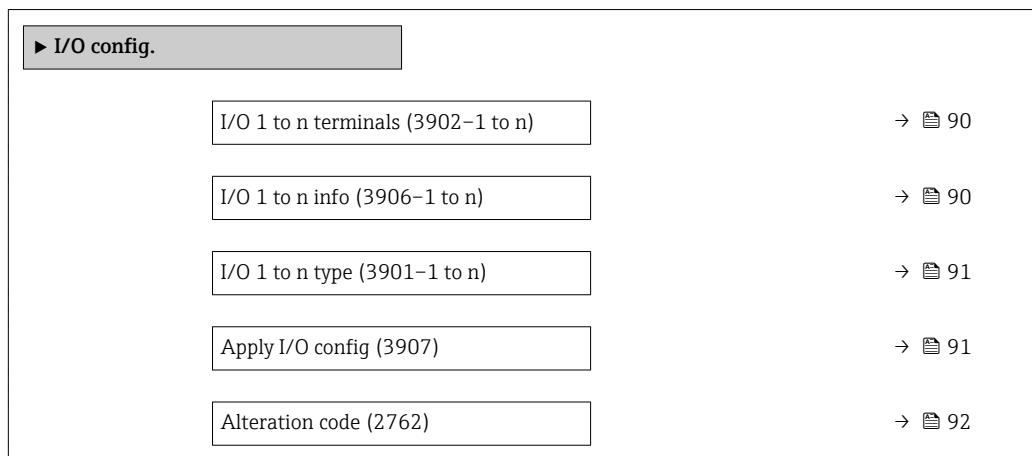
User interface Signed floating-point number

Factory setting 0

3.3 "I/O configuration" submenu

Navigation

Expert → I/O config.



I/O 1 to n terminals

Navigation

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

Description

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

User interface

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

I/O 1 to n info

Navigation

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

Description

Displays information about the plugged in I/O module.

User interface

- Not plugged
- Invalid
- Not configurable
- Configurable
- Profibus PA

| | |
|-------------------------------|---|
| Additional information | <p><i>"Not plugged"</i> option The I/O module is not plugged in.</p> <p><i>"Invalid"</i> option The I/O module is not plugged correctly.</p> <p><i>"Not configurable"</i> option The I/O module is not configurable.</p> <p><i>"Configurable"</i> option The I/O module is configurable.</p> <p><i>"Profibus PA"</i> option The I/O module is configured for PROFIBUS PA.</p> |
|-------------------------------|---|

I/O 1 to n type

| | |
|------------------------|---|
| 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 | <ul style="list-style-type: none"> ■ 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 | <ul style="list-style-type: none"> ■ No ■ Yes |
| Factory setting | No |

* Visibility depends on order options or device settings

Alteration code**Navigation**

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

Description

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

User entry

Positive integer

Factory setting

0

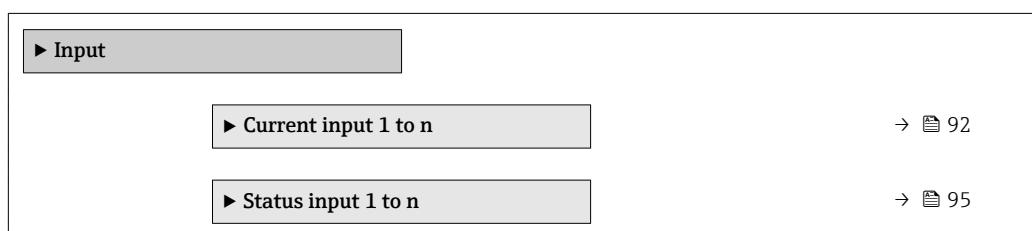
Additional information*Description*

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

3.4 "Input" submenu

Navigation

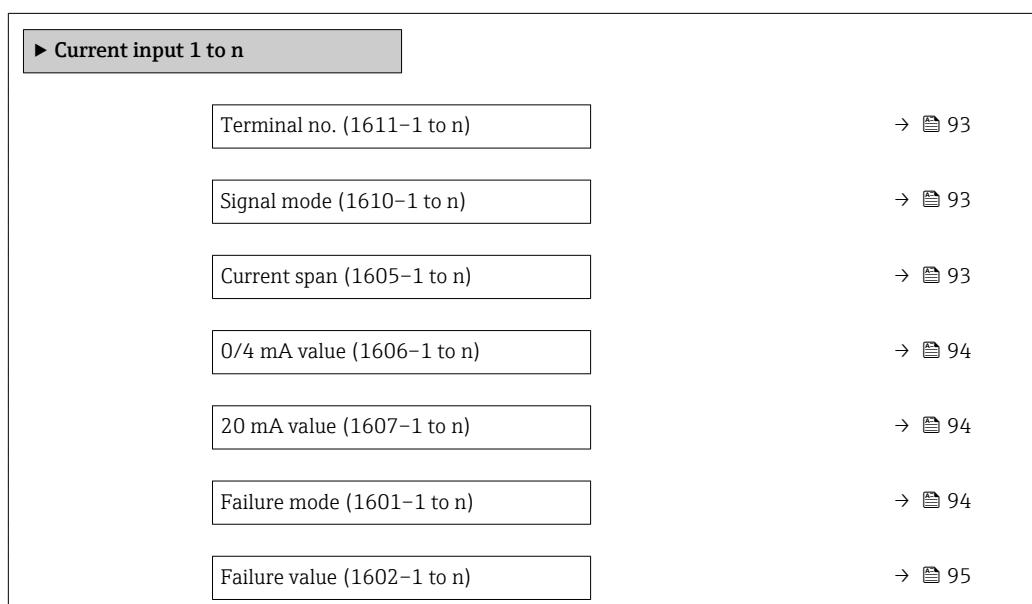
Expert → Input



3.4.1 "Current input 1 to n" submenu

Navigation

Expert → Input → Current input 1 to n



Terminal no.

| | |
|-------------------------------|--|
| 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 | <ul style="list-style-type: none"> ■ Not used ■ 24-25 (I/O 2) |
| Additional information | <p><i>"Not used" option</i></p> <p>The current input module does not use any terminal numbers.</p> |

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 | <ul style="list-style-type: none"> ■ 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 | <ul style="list-style-type: none"> ■ 4...20 mA ■ 4...20 mA NAMUR ■ 4...20 mA US ■ 0...20 mA |
| Factory setting | Country-specific: <ul style="list-style-type: none"> ■ 4...20 mA NAMUR ■ 4...20 mA US |
| Additional information | <p><i>Examples</i></p> <p> Sample values for the current range: Current span parameter (→  100)</p> |

* Visibility depends on order options or device settings

0/4 mA value



Navigation

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

Description

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

User entry

Signed floating-point number

Factory setting

0

Additional information

Current input behavior

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

- Current span (→ 93)
- Failure mode (→ 94)

Configuration examples

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

20 mA value



Navigation

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

Description

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

User entry

Signed floating-point number

Factory setting

Depends on country and nominal diameter

Additional information

Configuration examples

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

Failure mode



Navigation

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

Description

Use this function to select the input behavior when measuring a current outside the configured **Current span** parameter (→ 93).

Selection

- Alarm
- Last valid value
- Defined value

Factory setting

Alarm

Additional information*Options*

- Alarm
An error message is set.
- Last valid value
The last valid measured value is used.
- Defined value
A user-defined measured value is used (**Failure value** parameter (→ 95)).

Failure value**Navigation**

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

Prerequisite

In the **Failure mode** parameter (→ 94), the **Defined value** option is selected.

Description

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

User entry

Signed floating-point number

Factory setting

0

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

Expert → Input → Status input 1 to n

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

Terminal no.**Navigation**

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

Description

Displays the terminal numbers used by the status input module.

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

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

Assign stat.inp.



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

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

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

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

| | |
|------------------------|--|
| Additional information | <p><i>Selection</i></p> <ul style="list-style-type: none">■ 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 (→ 68) is activated. |
|------------------------|--|

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

Val.stat.inp.

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

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

| | |
|----------------|--|
| User interface | <ul style="list-style-type: none">■ 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.

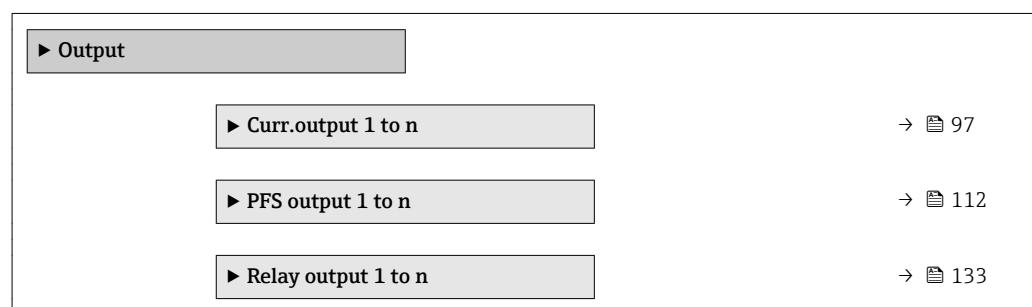
User entry 5 to 200 ms

Factory setting 50 ms

3.5 "Output" submenu

Navigation

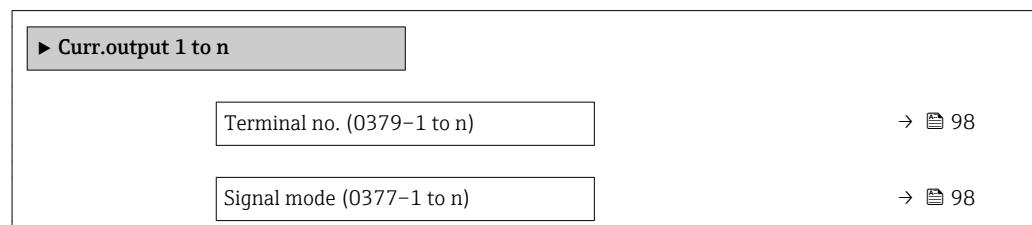
Expert → Output



3.5.1 "Current output 1 to n" submenu

Navigation

Expert → Output → Curr.output 1 to n



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

Terminal no.

Navigation

Expert → Output → Curr.output 1 to n → Terminal no. (0379-1 to n)

Description

Displays the terminal numbers used by the current output module.

User interface

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

Additional information

"Not used" option

The current output module does not use any terminal numbers.

Signal mode

**Navigation**

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

Description

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

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

* Visibility depends on order options or device settings

Factory setting Mass flow

Current span



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

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

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

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

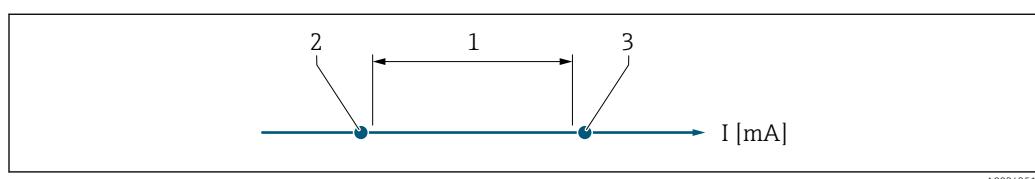
- Additional information** *Description*
- In the event of a device alarm, the current output adopts the value specified in the **Failure mode** parameter (→ 110).
 ▪ If the measured value is outside the measuring range, the diagnostic message **△S441 Curr.output 1 to n** is displayed.
 ▪ The measuring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

"Fixed current" option

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

Example

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



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

Selection

| Options | 1 | 2 | 3 |
|-----------------|-------------------|----------|------------|
| 4...20 mA NAMUR | 3.8 to 20.5 mA | < 3.6 mA | > 21.95 mA |
| 4...20 mA US | 3.9 to 20.8 mA US | < 3.6 mA | > 21.95 mA |

| Options | 1 | 2 | 3 |
|-----------|--------------|----------|------------|
| 4...20 mA | 4 to 20.5 mA | < 3.6 mA | > 21.95 mA |
| 0...20 mA | 0 to 20.5 mA | < 0 mA | > 21.95 mA |

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

Fixed current



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

Prerequisite The **Fixed current** option is selected in the **Current span** parameter (→  100).

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

User entry 0 to 22.5 mA

Factory setting 22.5 mA

0/4 mA value



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

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

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

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

User entry Signed floating-point number

Factory setting Country-specific:

- 0 kg/h
- 0 lb/min

Additional information *Description*

Positive and negative values are permitted depending on the process variable assigned in the **Assign curr.** parameter (→  99). In addition, the value can be greater than or

smaller than the value assigned for the 20 mA current in the **20 mA value** parameter (→ [103](#)).

Dependency

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

Current output behavior

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

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

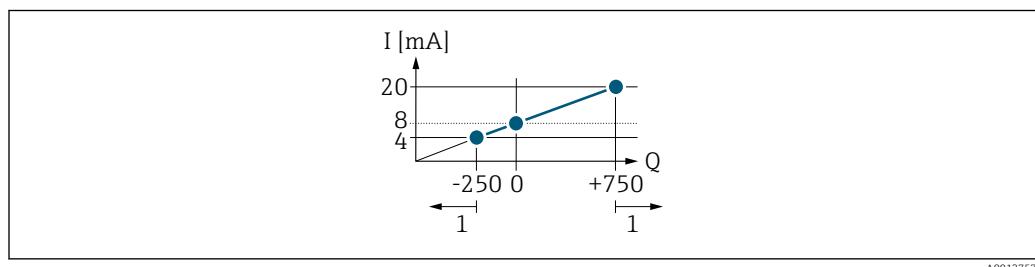
Configuration examples

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

Configuration example A

Measuring mode with **Forward flow** option

- **0/4 mA value** parameter (→ [101](#)) = not equal to zero flow (e.g. -250 m³/h)
- **20 mA value** parameter (→ [103](#)) = not equal to zero flow (e.g. +750 m³/h)
- Calculated current value = 8 mA at zero flow

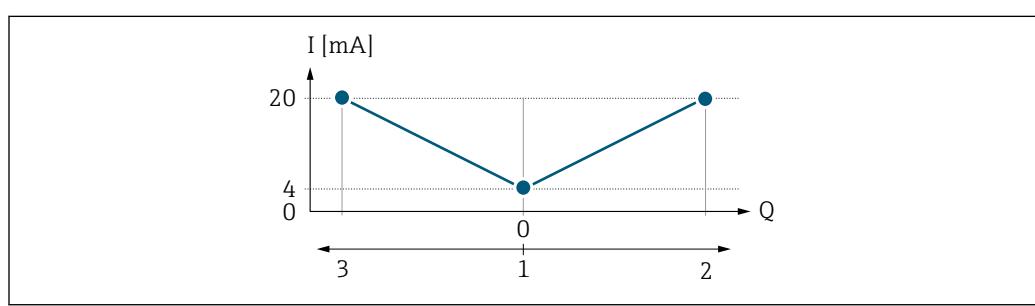


Q Flow
 I Current
 1 Measuring range is exceeded or undershot

The operational range of the measuring device is defined by the values entered for the **0/4 mA value** parameter (→ [101](#)) and **20 mA value** parameter (→ [103](#)). If the effective flow exceeds or falls below this operational range, the diagnostic message **△S441 Curr.output 1 to n** is displayed.

Configuration example B

Measuring mode with **Forward/Reverse** option



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

The current output signal is independent of the direction of flow (absolute amount of the measured variable). The values for the **0/4 mA value** parameter (→ 101) and **20 mA value** parameter (→ 103) must have the same sign. The value for the **20 mA value** parameter (→ 103) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (→ 103) (e.g. forward flow).

Configuration example C

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

If flow is characterized by severe fluctuations (e.g. when using reciprocating pumps), flow components outside the measuring range are buffered, balanced and output after a maximum delay of 60 s → 104.

20 mA value



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

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

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

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

User entry Signed floating-point number

Factory setting Depends on country and nominal diameter → 263

Additional information

Description
Positive and negative values are permitted depending on the process variable assigned in the **Assign curr.** parameter (→ 99). In addition, the value can be greater than or smaller than the value assigned for the 0/4 mA current in the **0/4 mA value** parameter (→ 101).

Dependency

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

Example

- Value assigned to 0/4 mA = -250 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 (→ 104), different signs cannot be entered for the values of the **0/4 mA value** parameter (→ 101) and **20 mA value** parameter (→ 103). The diagnostic message **△S441 Curr.output 1 to n** is displayed.

Configuration examples

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

Measuring mode**Navigation**

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

Prerequisite

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

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

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

In the **Current span** parameter (→ 100), one of the following options is selected:

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

Description

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

Selection

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

Factory setting

Forward flow

Additional information*Description*

The process variable that is assigned to the current output via the **Assign curr.** parameter (→ 99) is displayed below the parameter.

"Forward flow" option

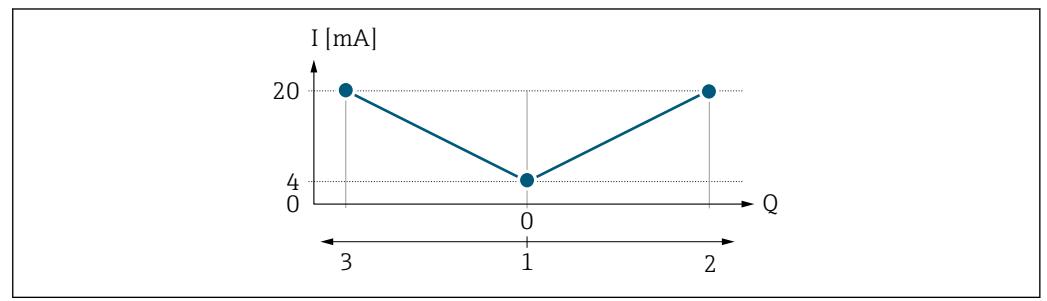
The current output signal is proportional to the process variable assigned. The measuring range is defined by the values that are assigned to the 0/4 mA and 20 mA current value.

* Visibility depends on order options or device settings

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

- Both values are defined such that they are not equal to zero flow e.g.:
 - 0/4 mA current value = $-5 \text{ m}^3/\text{h}$
 - 20 mA current value = $10 \text{ m}^3/\text{h}$
- If the effective flow exceeds or falls below this measuring range, the diagnostic message **△S441 Curr.output 1 to n** is displayed.

"Forward/Reverse" option



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

- The current output signal is independent of the direction of flow (absolute amount of the measured variable). The values for the **0/4 mA value** parameter (→ 101) and **20 mA value** parameter (→ 103) must have the same sign.
- The value for the **20 mA value** parameter (→ 103) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (→ 103) (e.g. forward flow).

"Rev. flow comp." option

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

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

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

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

Examples of how the current output behaves

Example 1

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

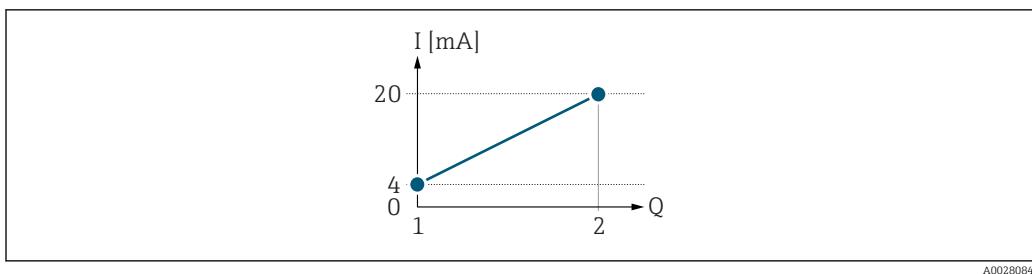


Fig 2 Measuring range

I Current

Q Flow

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

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

With the following flow response:

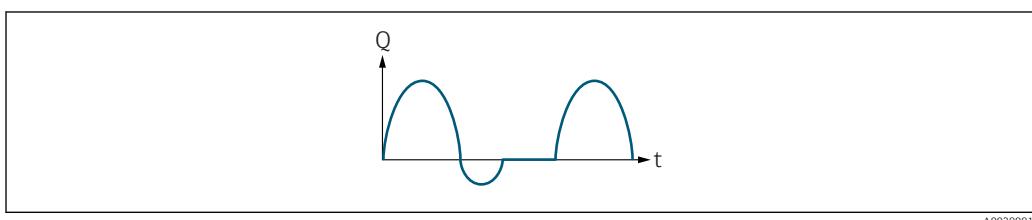


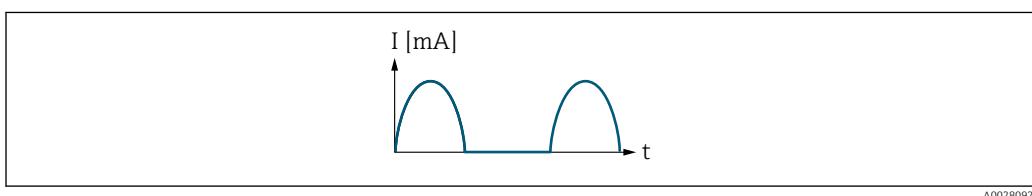
Fig 3 Flow response

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:.

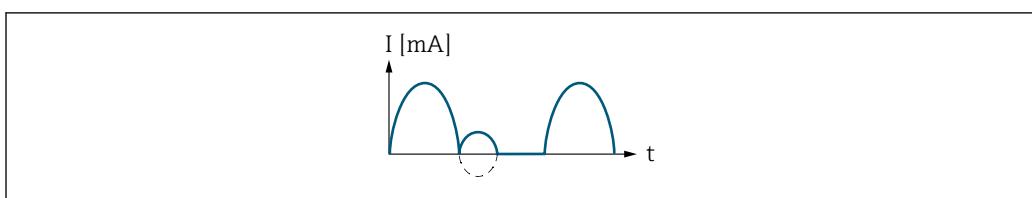


I Current

t Time

With **Forward/Reverse** option

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

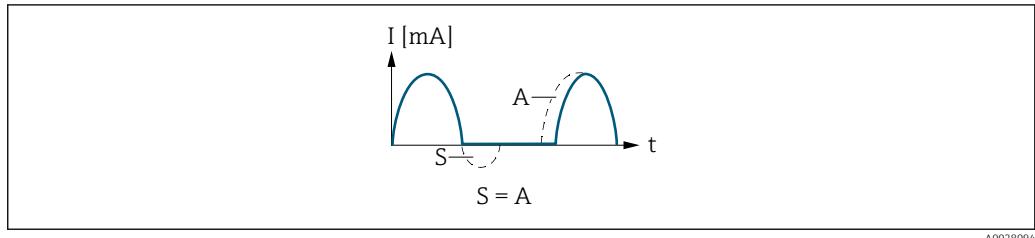


I Current

t Time

With **Rev. flow comp.** option

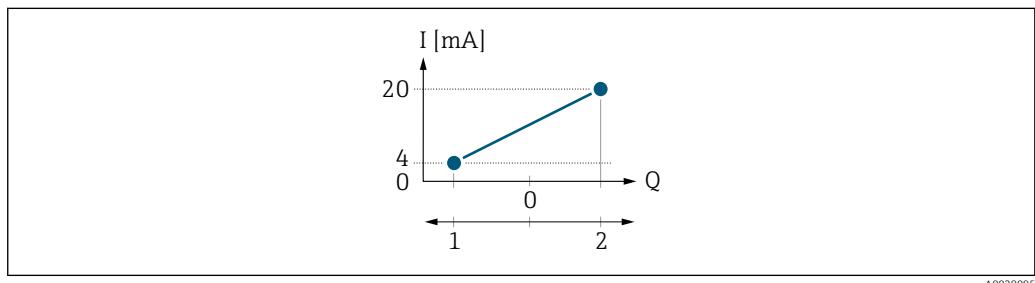
Flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.



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

Example 2

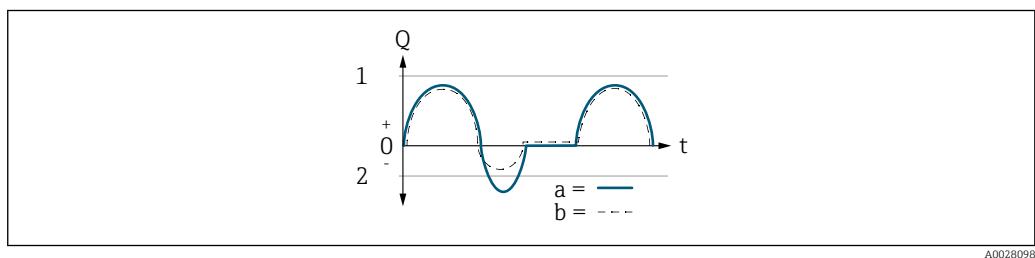
Defined measuring range: lower range value and upper range value with **different** signs



■ 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)

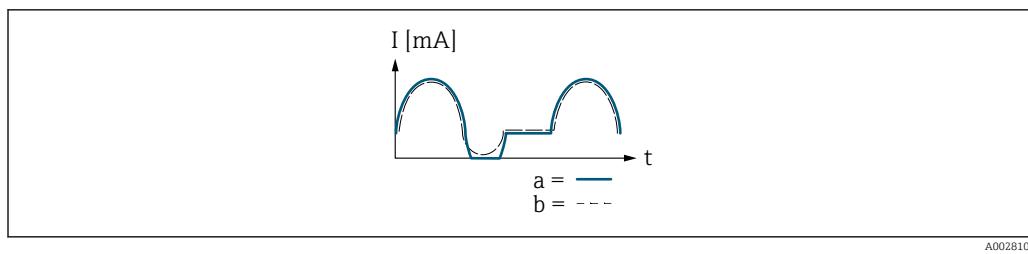
With flow a (–) outside, b (--) inside the measuring range



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

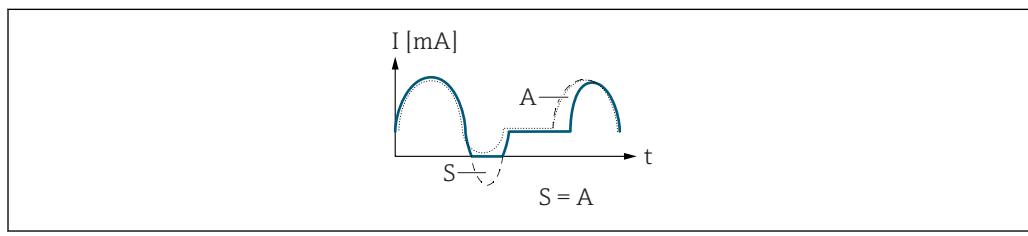
A0028100

With Forward/Reverse option

This option is not possible in this case as the values for the **0/4 mA value** parameter (\rightarrow 101) and **20 mA value** parameter (\rightarrow 103) have different signs.

With Rev. flow comp. option

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



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

A0028101

Damping out. 1 to n



Navigation

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

Prerequisite

A process variable is selected in the **Assign curr.** parameter (\rightarrow 99) and one of the following options is selected in the **Current span** parameter (\rightarrow 100):

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

Description

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

User entry

0.0 to 999.9 s

Factory setting

1.0 s

Additional information*User entry*

Use this function to enter a time constant (PT1 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**

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

Prerequisite

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

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



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

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

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

Description

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

User interface

Positive floating-point number

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

Additional information*Description*

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

- Current output damping → [108](#)
and
- Depending on the measured variable assigned to the output.
 - Flow damping
or
 - Density damping
or
 - Temperature damping

Failure mode**Navigation**

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

Prerequisite

A process variable is selected in the **Assign curr.** parameter (→ [99](#)) and one of the following options is selected in the **Current span** parameter (→ [100](#)):

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

Description

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

Selection

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

Factory setting

Max.

Additional information*Description*

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

"Min." option

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

 The signal on alarm level is defined via the **Current span** parameter (→ 100).

"Max." option

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

 The signal on alarm level is defined via the **Current span** parameter (→ 100).

"Last valid value" option

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

"Actual value" option

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

"Defined value" option

The current output adopts a defined measured value.

 The measured value is defined via the **Failure current** parameter (→ 111).

Failure current**Navigation**

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

Prerequisite

The **Defined value** option is selected in the **Failure mode** parameter (→ 110).

Description

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

User entry

0 to 22.5 mA

Factory setting

22.5 mA

Output curr. 1 to n**Navigation**

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

Description

Displays the current value currently calculated for the current output.

User interface

3.59 to 22.5 mA

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

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

Description

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

User interface

0 to 30 mA

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

Expert → Output → PFS output 1 to n

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

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

Terminal no.

Navigation

Expert → Output → PFS output 1 to n → Terminal no. (0492-1 to n)

Description

Displays the terminal numbers used by the pulse/frequency/switch output module.

User interface

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

Additional information

"Not used" option

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

Signal mode**Navigation**

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

Description

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

Selection

- Passive
- Active

Factory setting

Passive

Operating mode**Navigation**

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

Description

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

Selection

- Pulse
- Frequency
- Switch

Factory setting

Pulse

Additional information*"Pulse" option*

Quantity-dependent pulse with configurable pulse width

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

Example

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

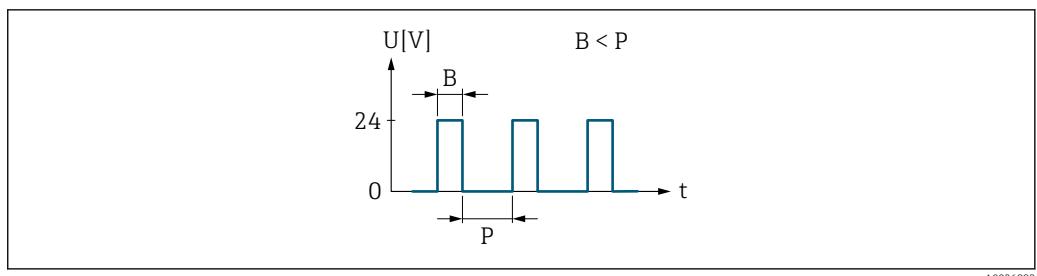


Fig 5 Quantity-proportional pulse (pulse value) with pulse width to be configured

B Pulse width entered

P Pauses between the individual pulses

"Frequency" option

Flow-proportional frequency output with 1:1 on/off ratio

An output frequency is output that is proportional to the value of a process variable, such as mass flow, volume flow, corrected volume flow, target mass flow, carrier mass flow, density, reference density, concentration, temperature, carrier tube temperature, electronic temperature, vibration frequency, frequency fluctuation, oscillation amplitude, oscillation damping, oscillation damping fluctuation, signal asymmetry or excitation current.

Example

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

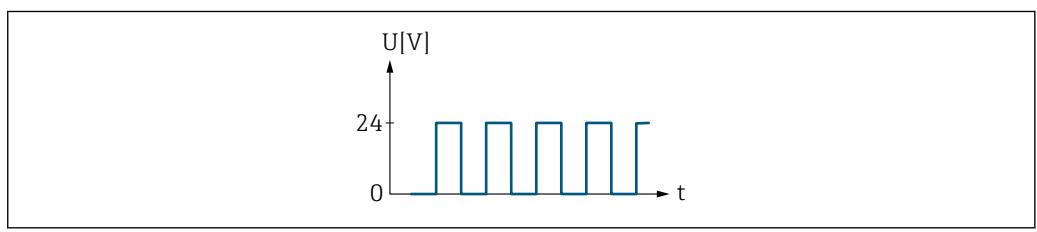


Fig 6 Flow-proportional frequency output

"Switch" option

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

Example

Alarm response without alarm

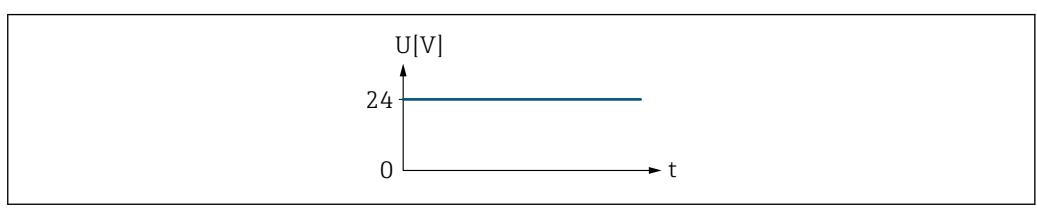
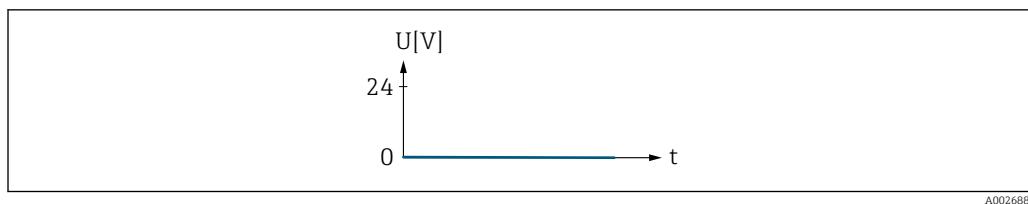


Fig 7 No alarm, high level

Example

Alarm response in case of alarm



8 Alarm, low level

Assign pulse 1 to n



Navigation

Expert → Output → PFS output 1 to n → Assign pulse 1 to n (0460–1 to n)

Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (→ 114) parameter.

Description

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

Selection

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

Factory setting

Off

Value per pulse



Navigation

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

Prerequisite

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

Description

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

User entry

Signed floating-point number

Factory setting

Depends on country and nominal diameter → 263

Additional information

User entry

Weighting of the pulse output with a quantity.

The lower the pulse value, the

- better the resolution.
- the higher the frequency of the pulse response.

* Visibility depends on order options or device settings

Pulse width**Navigation**

Expert → Output → PFS output 1 to n → Pulse width (0452–1 to n)

Prerequisite

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

Description

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

User entry

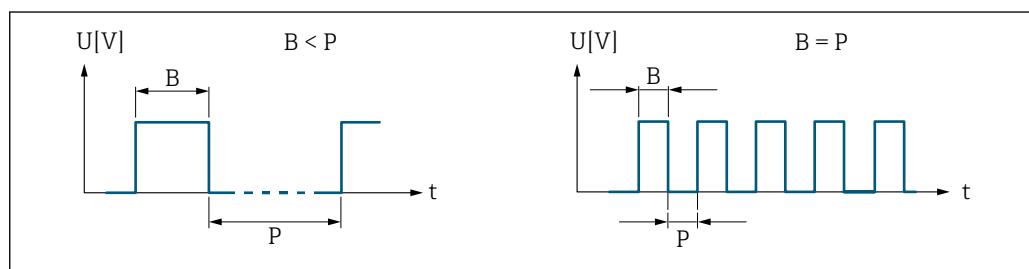
0.05 to 2 000 ms

Factory setting

100 ms

Additional information*Description*

- Define how long a pulse is (duration).
- The maximum pulse rate is defined by $f_{\max} = 1 / (2 \times \text{pulse width})$.
- The interval between two pulses lasts at least as long as the set pulse width.
- The maximum flow is defined by $Q_{\max} = f_{\max} \times \text{pulse value}$.
- If the flow exceeds these limit values, the measuring device displays the diagnostic message **△S443 Pulse output 1 to n**.



B Pulse width entered

P Pauses between the individual pulses

Example

- Pulse value: 0.1 g
- Pulse width: 0.1 ms
- $f_{\max}: 1 / (2 \times 0.1 \text{ ms}) = 5 \text{ kHz}$
- $Q_{\max}: 5 \text{ kHz} \times 0.1 \text{ g} = 0.5 \text{ kg/s}$

Measuring mode**Navigation**

Expert → Output → PFS output 1 to n → Measuring mode (0457–1 to n)

Prerequisite

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

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

* Visibility depends on order options or device settings

Description Use this function to select the measuring mode for the pulse output.

Selection

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

Factory setting Forward flow

Additional information *Selection*

- Forward flow
Positive flow is output, negative flow is not output.
- Forward/Reverse
Positive and negative flow are output (absolute value), but a distinction is not made between positive and negative flow.
- Reverse flow
Negative flow is output, positive flow is not output.
- Rev. flow comp.
The flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.

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

Examples

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

Failure mode



Navigation  Expert → Output → PFS output 1 to n → Failure mode (0480-1 to n)

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

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

Selection

- Actual value
- No pulses

Factory setting No pulses

Additional information *Description*

The dictates of safety render it advisable to ensure that the pulse output shows a predefined behavior in the event of a device alarm.

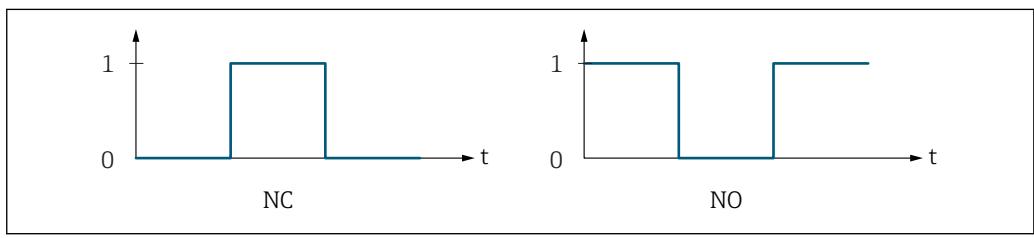
Selection

- Actual value
In the event of a device alarm, the pulse output continues on the basis of the current flow measurement. The fault is ignored.
- No pulses
In the event of a device alarm, the pulse output is "switched off".

NOTICE! A device alarm is a measuring device error that must be taken seriously. It can affect the measurement quality such that the quality can no longer be guaranteed. The **Actual value** option is only recommended if it can be guaranteed that all possible alarm conditions will not affect the measurement quality.

Pulse output 1 to n

| | |
|-------------------------------|---|
| 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 (→ 114) 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. |



A0028726

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

The output behavior can be reversed via the **Invert outp.sig.** parameter (→ [132](#)) i.e. the transistor does not conduct for the duration of the pulse.

In addition, the behavior of the output in the event of a device alarm (**Failure mode** parameter (→ [118](#))) can be configured.

Assign freq.

| | |
|---------------------|--|
| 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 (→ 114) 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
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. ampl. 0 *
- Freq. fluct. 0 *
- Osc. damping 0 *
- Osc.damp.fluct 0 *
- Signal asymmetry *
- Exc. current 0 *
- HBSI *
- Pressure

Factory setting

Off

Min. freq. value**Navigation**

Expert → Output → PFS output 1 to n → Min. freq. value (0453–1 to n)

Prerequisite

The **Frequency** option is selected in the **Operating mode** parameter (→ 114) and a process variable is selected in the **Assign freq.** parameter (→ 119).

Description

Use this function to enter the start value frequency.

* Visibility depends on order options or device settings

User entry 0.0 to 10 000.0 Hz

Factory setting 0.0 Hz

Max. freq. value



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

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (→ 114) and a process variable is selected in the **Assign freq.** parameter (→ 119).

Description Use this function to enter the end value frequency.

User entry 0.0 to 10 000.0 Hz

Factory setting 10 000.0 Hz

Val. at min.freq



Navigation Expert → Output → PFS output 1 to n → Val. at min.freq (0476–1 to n)

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (→ 114) and a process variable is selected in the **Assign freq.** parameter (→ 119).

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

User entry Signed floating-point number

Factory setting Depends on country and nominal diameter

Additional information *Dependency*

The entry depends on the process variable selected in the **Assign freq.** parameter (→ 119).

Val. at max.freq



Navigation Expert → Output → PFS output 1 to n → Val. at max.freq (0475–1 to n)

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (→ 114) and a process variable is selected in the **Assign freq.** parameter (→ 119).

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

User entry Signed floating-point number

Factory setting Depends on country and nominal diameter

Additional information*Description*

Use this function to enter the maximum measured value at the maximum frequency. The selected process variable is output as a proportional frequency.

Dependency

 The entry depends on the process variable selected in the **Assign freq.** parameter (→ 119).

Measuring mode**Navigation**

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

Prerequisite

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

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

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

Description

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

Selection

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

Factory setting

Forward flow

Additional information*Selection*

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

Examples

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

* Visibility depends on order options or device settings

Damping out. 1 to n**Navigation**

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

Prerequisite

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

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

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

Description

Use this function to enter a time constant for the reaction time of the output signal to fluctuations in the measured value.

User entry

0 to 999.9 s

Factory setting

0.0 s

Additional information

User entry

Use this function to enter a time constant (PT1 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.

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

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

* Visibility depends on order options or device settings

7) proportional transmission behavior with first order delay

Response time

Navigation

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

Prerequisite

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

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

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

Description

Displays the response time. This specifies how quickly the pulse/frequency/switch output reaches the measured value change of 63 % of 100 % of the measured value change.

User interface

Positive floating-point number

Additional information

Description

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

- Damping of pulse/frequency/switch output → 108
and
- Depending on the measured variable assigned to the output.
 - Flow damping
 - or
 - Density damping
 - or
 - Temperature damping

Failure mode



Navigation

  Expert → Output → PFS output 1 to n → Failure mode (0451–1 to n)

Prerequisite

The **Frequency** option is selected in the **Operating mode** parameter (→ 114) and a process variable is selected in the **Assign freq.** parameter (→ 119).

* Visibility depends on order options or device settings

| | |
|-------------------------------|--|
| Description | Use this function to select the failure mode of the frequency output in the event of a device alarm. |
| 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. (→ 125) replaces the current measured value, making it possible to bypass the device alarm. The actual measurement is switched off for the duration of the device alarm. ■ 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 (→ 114) and a process variable is selected in the Assign freq. parameter (→ 119). |
| 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 (→ 114), 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 (→ [114](#)).

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

Selection

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

Factory setting Off

Additional information Selection

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

Assign diag. beh



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

Prerequisite

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

Description Use this function to select the diagnostic event category that is displayed for the switch output.

Selection

- Alarm
- Alarm or warning
- Warning

Factory setting Alarm

Additional information*Description*

If no diagnostic event is pending, the switch output is closed and conductive.

Selection

- Alarm
The switch output signals only diagnostic events in the alarm category.
- Alarm or warning
The switch output signals diagnostic events in the alarm and warning category.
- Warning
The switch output signals only diagnostic events in the warning category.

Assign limit**Navigation**

Expert → Output → PFS output 1 to n → Assign limit (0483–1 to n)

Prerequisite

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

Description

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

Selection

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

* Visibility depends on order options or device settings

- Totalizer 1
- Totalizer 2
- Totalizer 3

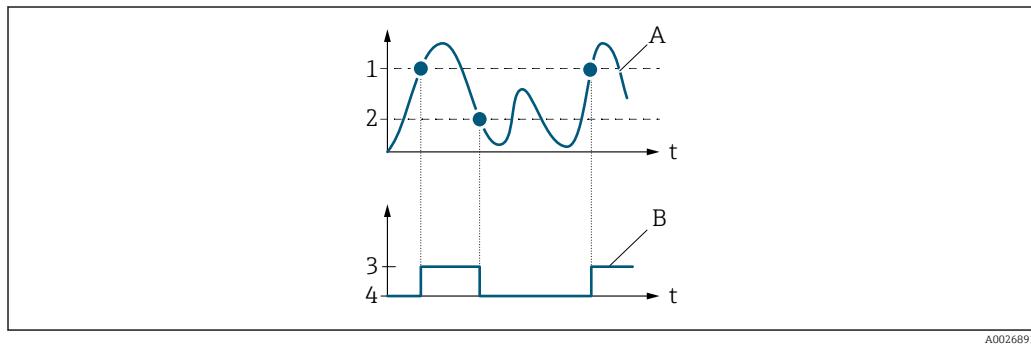
Factory setting

Mass flow

Additional information*Description*

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

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

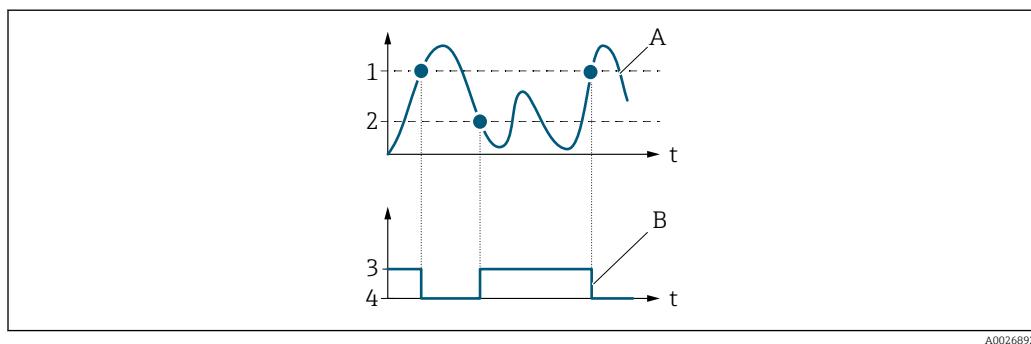


A0026891

- | | |
|---|------------------|
| 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

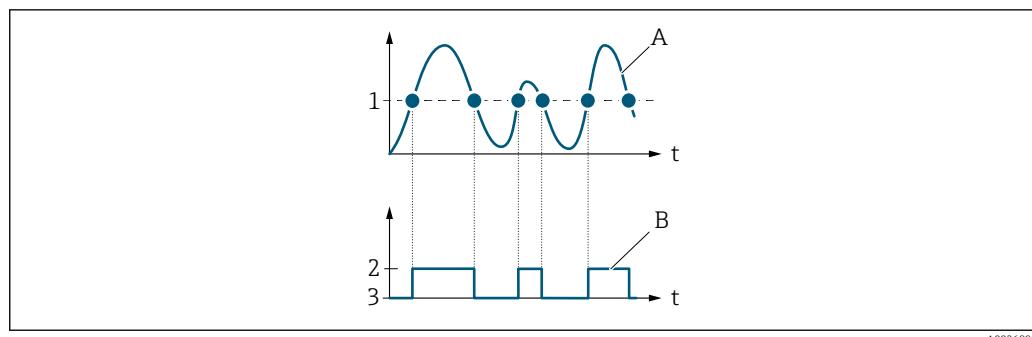


A0026892

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

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

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



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

Switch-on value



Navigation

Expert → Output → PFS output 1 to n → Switch-on value (0466-1 to n)

Prerequisite

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

Description

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

User entry

Signed floating-point number

Factory setting

Country-specific:

- 0 kg/h
- 0 lb/min

Additional information

Description

Use this function to enter the limit value for the switch-on value (process variable > switch-on value = closed, conductive).

When using a hysteresis: Switch-on value > Switch-off value.

Dependency

The unit depends on the process variable selected in the **Assign limit** parameter (→ 127).

Switch-off value



Navigation

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

Prerequisite

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

Description

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

| | |
|-------------------------------|--|
| 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 (→ 127).</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 (→ 114). ■ The Fl. direct.check option is selected in the Switch out funct parameter (→ 126). |
| 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 (→ 114). ■ The Status option is selected in the Switch out funct parameter (→ 126). |
| 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 ■ Digital outp. 4 * |
| Factory setting | Partial pipe det |

* Visibility depends on order options or device settings

Additional information*Options*

If empty pipe detection or low flow cut off are enabled, the output is conductive. Otherwise, the switch output is non-conductive.

Switch-on delay**Navigation**

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

Prerequisite

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

Description

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

User entry

0.0 to 100.0 s

Factory setting

0.0 s

Switch-off delay**Navigation**

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

Prerequisite

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

Description

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

User entry

0.0 to 100.0 s

Factory setting

0.0 s

Failure mode**Navigation**

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

Description

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

Selection

- Actual status
- Open
- Closed

Factory setting

Open

Additional information*Options*

■ Actual status

In the event of a device alarm, faults are ignored and the current behavior of the input value is output by the switch output. The **Actual status** option behaves in the same way as the current input value.

■ Open

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

■ Closed

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

Switch status 1 to n**Navigation**

Expert → Output → PFS output 1 to n → Switch status 1 to n (0461-1 to n)

Prerequisite

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

Description

Displays the current switch status of the status output.

User interface

- Open
- Closed

Additional information*User interface*

■ Open

The switch output is not conductive.

■ Closed

The switch output is conductive.

Invert outp.sig.**Navigation**

Expert → Output → PFS output 1 to n → Invert outp.sig. (0470-1 to n)

Description

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

Selection

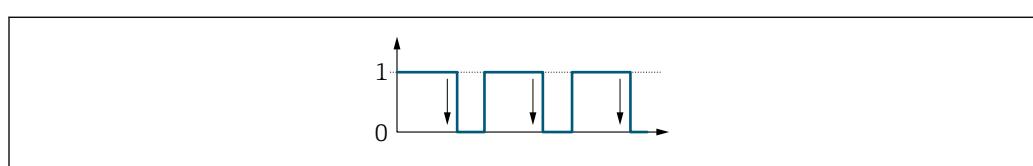
- No
- Yes

Factory setting

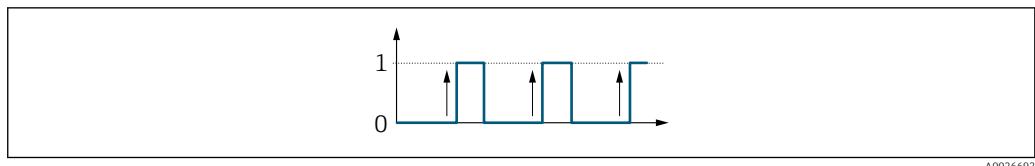
No

Additional information*Selection*

No option (passive - negative)



Yes option (passive - positive)



3.5.3 "Relay output 1 to n" submenu

Navigation

Expert → Output → Relay output 1 to n

| ► Relay output 1 to n | |
|-----------------------|-------|
| Terminal no. | → 133 |
| Relay outp.func. | → 134 |
| Assign dir.check | → 134 |
| Assign limit | → 135 |
| Assign diag. beh | → 136 |
| Assign status | → 136 |
| Switch-off value | → 136 |
| Switch-off delay | → 137 |
| Switch-on value | → 137 |
| Switch-on delay | → 138 |
| Failure mode | → 138 |
| Switch status | → 139 |
| Powerless relay | → 139 |

Terminal no.

Navigation

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

Description

Displays the terminal numbers used by the relay output module.

User interface

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

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 (→ 134), the **Fl. direct.check** option is selected.

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 limit

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

Prerequisite The **Limit** option is selected in the **Relay outp.func.** parameter (→ 134) parameter.

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

| | |
|------------------|---|
| Selection | <ul style="list-style-type: 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 vol. flow * ■ Oil corr.vol.fl. * ■ Water corr.v.fl. * ■ Concentration ■ Temperature ■ Oscil. damping ■ Pressure ■ Totalizer 1 ■ Totalizer 2 ■ Totalizer 3 |
|------------------|---|

| | |
|------------------------|-----------|
| 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 (→ 134), the **Diag. behavior** option is selected.

Description

Use this function to select the category of the diagnostic events that are displayed for the relay output.

Selection

- Alarm
- Alarm or warning
- Warning

Factory setting

Alarm

Additional information

Description

If no diagnostic event is pending, the relay output is closed and conductive.

Selection

- Alarm
The relay output signals only diagnostic events in the alarm category.
- Alarm or warning
The relay output signals diagnostic events in the alarm and warning category.
- Warning
The relay output signals only diagnostic events in the warning category.

Assign status



Navigation

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

Prerequisite

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

Description

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

Selection

- Partial pipe det
- Low flow cut off
- Digital outp. 4^{*}

Factory setting

Partial pipe det

Switch-off value



Navigation

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

Prerequisite

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

* Visibility depends on order options or device settings

| | |
|-------------------------------|---|
| 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 is dependent on the process variable selected in the Assign limit parameter (→ 135).</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 (→ 134), 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 (→ 134), 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 is dependent on the process variable selected in the **Assign limit** parameter (→ 135).

Switch-on delay**Navigation**

Expert → Output → Relay output 1 to n → Switch-on delay (0814-1 to n)

Prerequisite

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

Description

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

User entry

0.0 to 100.0 s

Factory setting

0.0 s

Failure mode**Navigation**

Expert → Output → Relay output 1 to n → Failure mode (0811-1 to n)

Description

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

Selection

- Actual status
- Open
- Closed

Factory setting

Open

Additional information*Selection*

- Actual status

In the event of a device alarm, faults are ignored and the current behavior of the input value is output by the relay output. The **Actual status** option behaves in the same way as the current input value.

- Open

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

- Closed

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

Switch status

Navigation   Expert → Output → Relay output 1 to n → Switch status (0801–1 to n)

Description Displays the current status of the relay output.

User interface

- Open
- Closed

Additional information *User interface*

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

Powerless relay 

Navigation   Expert → Output → Relay output 1 to n → Powerless relay (0816–1 to n)

Description Use this function to select the quiescent state for the relay output.

Selection

- Open
- Closed

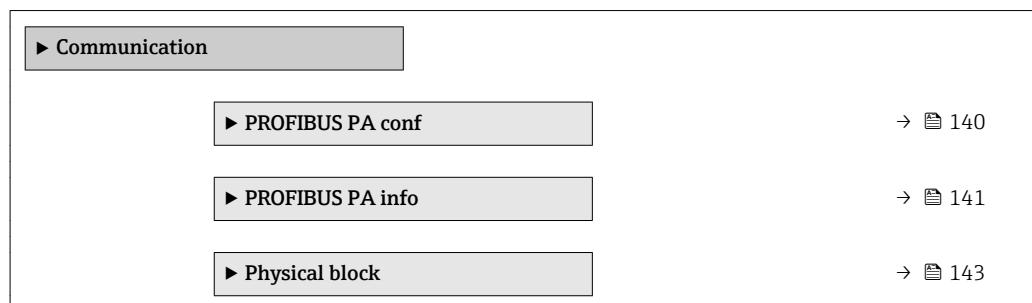
Factory setting Open

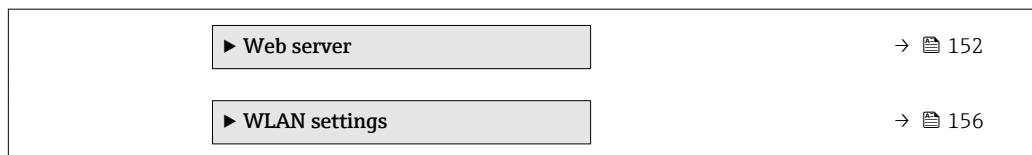
Additional information *Selection*

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

3.6 "Communication" submenu

Navigation   Expert → Communication

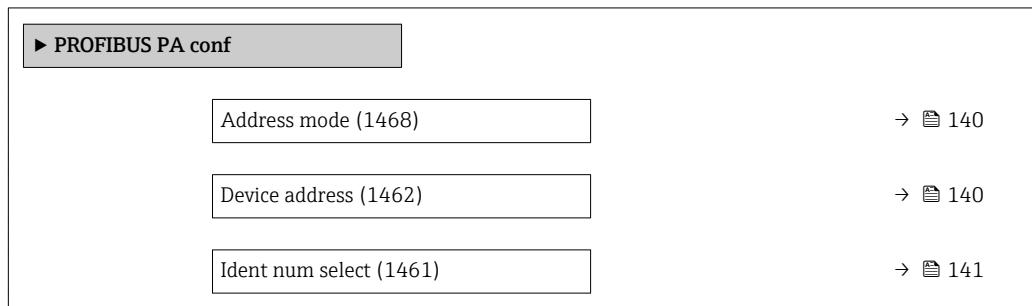




3.6.1 "PROFIBUS PA conf" submenu

Navigation

Expert → Communication → PROFIBUS PA conf



Address mode

Navigation

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

Description

Displays the configured address mode.

User interface

- Hardware
- Software

Factory setting

Software

Additional information

Description

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

Device address



Navigation

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

Description

Use this function to enter the device address.

User entry

0 to 126

Factory setting

126

Additional information

Description

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

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

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

Ident num select



Navigation

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

Description

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

Selection

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

Factory setting

Automatic mode

Additional information

Description

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

3.6.2 "PROFIBUS PA info" submenu

Navigation

 Expert → Communication → PROFIBUS PA info

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

Stat Master Conf

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

Ident number

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

Profile version

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

Baudrate

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

Master avail.

| | |
|------------------------|--|
| Navigation |   Expert → Communication → PROFIBUS PA info → Master avail. (1517) |
| Description | Displays whether or not a PROFIBUS master is present in the network. |
| User interface | <ul style="list-style-type: none"> ■ No ■ Yes |
| Factory setting | No |

3.6.3 "Physical block" submenu

Navigation   Expert → Communication → Physical block

| ► Physical block | |
|------------------------|---|
| Device tag (1496) | →  144 |
| Static revision (1495) | →  144 |
| Strategy (1494) | →  145 |
| Alert key (1473) | →  145 |
| Target mode (1497) | →  145 |
| Mode block act (1472) | →  145 |
| Mode block perm (1493) | →  146 |
| Mode blk norm (1492) | →  146 |
| Alarm summary (1474) | →  146 |
| Software rev. (1478) | →  147 |
| Hardware rev. (1479) | →  147 |
| Manufacturer ID (1502) | →  147 |
| Device ID (1480) | →  148 |
| Serial number (1481) | →  148 |
| Diagnostics (1482) | →  148 |

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

Device tag



Navigation

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

Description

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

User entry

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

Factory setting

Cubemass 300 PA

Static revision

Navigation

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

Description

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

User interface

0 to FFFF

Additional information

Description

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

Strategy**Navigation**

Expert → Communication → Physical block → Strategy (1494)

Description

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

User entry

0 to FFFF

Factory setting

0

Alert key**Navigation**

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

Description

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

User entry

0 to 0xFF

Factory setting

0

Target mode**Navigation**

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

Description

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

User interface

- Auto
- Out of service

Mode block act**Navigation**

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

Description

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

User interface

- Auto
- Out of service

Additional information*Description*

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

Mode block perm

Navigation

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

Description

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

User interface

0 to 255

Mode blk norm

Navigation

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

Description

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

User interface

- Auto
- Out of service

Alarm summary

Navigation

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

Description

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

User interface

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

Additional information*Description*

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

User interface

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

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

Software rev.**Navigation**

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

Description

Displays the firmware version of the measuring device.

User interface

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

Hardware rev.**Navigation**

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

Description

Displays the hardware revision of the measuring device.

User interface

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

Manufacturer ID**Navigation**

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

Description

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

User interface 0 to FFFF

Factory setting 0x11

Device ID

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

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

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

Factory setting Promass300/500PA

Serial number

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

Description Displays the serial number of the measuring device. It can also be found on the nameplate of the sensor and transmitter.

User interface Max. 11-digit character string comprising letters and numbers.

Additional information *Description*

 **Uses of the serial number**

- To identify the measuring device quickly, e.g. when contacting Endress+Hauser.
- To obtain specific information on the measuring device using the Device Viewer:
www.endress.com/deviceviewer

Diagnostics

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

Description Displays the diagnostic messages.

User interface

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

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

Diagnostics mask

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

Description Displays the diagnostic messages supported by the measuring device.

User interface

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

Device certific.

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

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

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

Factory reset

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

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

Selection

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

Factory setting Cancel

Descriptor

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

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

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

Device message

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

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

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

Device inst.date

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

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

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

* Visibility depends on order options or device settings

Ident num select

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

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

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

Factory setting Automatic mode

Additional information *Description*

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

Hardware lock

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

Description Displays the hardware write protection.

- User interface**
- Unprotected
 - Protected

Additional information *Description*

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

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

User interface

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

Feature support

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

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

User interface

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

Feature enabled

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

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

User interface

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

Condensed status



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

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

Selection

- Off
- On

Factory setting On

3.6.4 "Web server" submenu

Navigation  Expert → Communication → Web server

 **Web server**

Webserv.language (7221) →  153

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

Webserv.language

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

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

Factory setting English

MAC Address

Navigation Expert → Communication → Web server → MAC Address (7214)**Description** Displays the MAC⁸⁾ address of the measuring device.

8) Media Access Control

User interface Unique 12-digit character string comprising letters and numbers

Factory setting Each measuring device is given an individual address.

Additional information *Example*

For the display format

00:07:05:10:01:5F

DHCP client



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

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

Selection
▪ Off
▪ On

Factory setting Off

Additional information *Result*

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

Identification is via the MAC address of the measuring device.

IP address



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

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

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

Factory setting 192.168.1.212

Additional information

Subnet mask



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

Description Display or enter the subnet mask.

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

Factory setting 255.255.255.0



Default gateway

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

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

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

Factory setting 0.0.0.0



Webserver funct.

Navigation Expert → Communication → Web server → Webserver funct. (7222)

Description Use this function to switch the Web server on and off.

Selection

- Off
- HTML Off
- On

Factory setting On

Additional information *Description*

Once disabled, the Webserver funct. can only be re-enabled via or the operating tool FieldCare.

Selection

| Option | Description |
|----------|--|
| Off | <ul style="list-style-type: none"> ▪ The web server is completely disabled. ▪ Port 80 is locked. |
| HTML Off | The HTML version of the web server is not available. |
| 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 → Web server → Login page (7273)

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

Selection

- Without header
- With header

Factory setting

With header

3.6.5 "WLAN settings" submenu

Navigation

Expert → Communication → WLAN settings

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

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

WLAN**Navigation**

Expert → Communication → WLAN settings → WLAN (2702)

Description

Use this function to enable and disable the WLAN connection.

Selection

- Disable
- Enable

Factory setting

Enable

WLAN mode**Navigation**

Expert → Communication → WLAN settings → WLAN mode (2717)

Description

Use this function to select the WLAN mode.

Selection

- Access point
- WLAN Client

Factory setting

Access point

SSID name**Navigation**

Expert → Communication → WLAN settings → SSID name (2714)

Prerequisite

The client is activated.

Description

Use this function to enter the user-defined SSID name (max. 32 characters) of the WLAN network.

User entry

–

Factory setting

–

Network security

Navigation Expert → Communication → WLAN settings → Network security (2705)

Description Use this function to select the type of security for the WLAN interface.

Selection

- Unsecured
- WPA2-PSK
- EAP-PEAP MSCHAP2 *
- EAP-PEAP NoAuth.*
- EAP-TLS*

Factory setting WPA2-PSK

Additional information *Selection*

- Unsecured
Access the WLAN connection without identification.
- WPA2-PSK
Access the WLAN connection with a network key.

Sec. identific.

Navigation Expert → Communication → WLAN settings → Sec. identific. (2718)

Description Use this function to select the security settings (download via the menu: Data Management > Security > Download WLAN).

User interface

- Trust. iss.cert.
- Device certific.
- Dev. private key

User name

Navigation Expert → Communication → WLAN settings → User name (2715)

Description Use this function to enter the username of the WLAN network.

User entry

–

Factory setting

–

* Visibility depends on order options or device settings

WLAN password

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

Description Use this function to enter the WLAN password for the WLAN network.

User entry –

Factory setting –

WLAN IP address

Navigation Expert → Communication → WLAN settings → WLAN IP address (2711)

Description Use this function to enter the IP address of the measuring device's WLAN connection.

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

Factory setting 192.168.1.212

WLAN MAC address

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

Description Displays the 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 (→ 158). |
| Description | Use this function to enter the network key. |
| User entry | 8 to 32-digit character string comprising numbers, letters and special characters |
| Factory setting | Serial number of the measuring device (e.g. L100A802000) |

Assign SSID name



| | |
|-------------------------------|--|
| Navigation | Expert → Communication → WLAN settings → Assign SSID name (2708) |
| Description | Use this function to select which name is used for the SSID ¹⁰⁾ . |
| Selection | <ul style="list-style-type: none">■ Device tag■ User-defined |
| Factory setting | User-defined |
| Additional information | <i>Selection</i> <ul style="list-style-type: none">■ 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 | <ul style="list-style-type: none">■ The User-defined option is selected in the Assign SSID name parameter (→ 160) parameter.■ The Access point option is selected in the WLAN mode parameter (→ 157) parameter. |
| Description | Use this function to enter a user-defined SSID name. |
| User entry | Max. 32-digit character string comprising numbers, letters and special characters |

10) Service Set Identifier

| | |
|------------------------|--|
| Factory setting | EH_device designation_last 7 digits of the serial number (e.g. EH_Cubemass_300_A802000) |
|------------------------|--|

WLAN channel



Navigation Expert → Communication → WLAN settings → WLAN channel (2704)

Description Use this function to enter the WLAN channel.

User entry 1 to 11

Factory setting 6

Additional information *Description*



- It is only necessary to enter a WLAN channel if multiple WLAN devices are in use.
- If just one measuring device is in use, it is recommended to keep the factory setting.

Select antenna



Navigation Expert → Communication → WLAN settings → Select antenna (2713)

Description Use this function to select whether the external or internal antenna is used for reception.

Selection

- External antenna
- Internal antenna

Factory setting Internal antenna

Connection state

Navigation Expert → Communication → WLAN settings → Connection state (2722)

Description The connection status is displayed.

User interface

- Connected
- Not connected

Factory setting Not connected

Rec.sig.strength

| | |
|------------------------|--|
| Navigation |   Expert → Communication → WLAN settings → Rec.sig.strength (2721) |
| Description | Displays the signal strength received. |
| User interface | <ul style="list-style-type: none">■ Low■ Medium■ High |
| Factory setting | High |

Gateway IP addr.

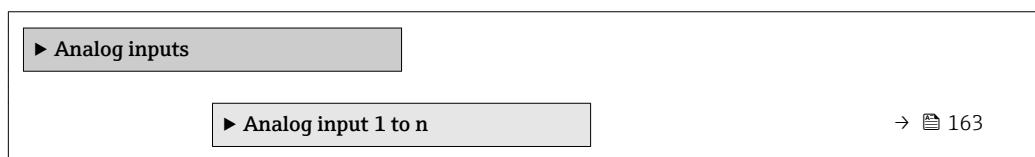
| | |
|------------------------|--|
| Navigation |   Expert → Communication → WLAN settings → Gateway IP addr. (2719) |
| Description | Use this function to enter the IP address of the gateway. |
| Factory setting | 192.168.1.212 |

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 "Analog inputs" submenu

Navigation   Expert → Analog inputs



3.7.1 "Analog input 1 to n" submenu

Navigation



Expert → Analog inputs → Analog input 1 to n

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

Channel



Navigation

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

Description

For selecting the process variable.

Selection

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

* Visibility depends on order options or device settings

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

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

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

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

User entry Positive floating-point number

Factory setting 0

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

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

Description Use this function to select the failure mode.

Selection

- Fail-safe value
- Fallback value
- Off

Factory setting Off

Additional information *Selection*

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

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

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

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

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

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

User entry Signed floating-point number

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

Out value

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

Out status

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

Out status

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

Tag description

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

Static revision

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

Strategy

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

Alert key

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

Target mode

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

Mode block act

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

Mode block perm

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

Mode blk norm

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

Alarm summary

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

User interface

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

Additional information*Description*

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

Batch ID**Navigation**

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

Description

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

User entry

Positive integer

Batch operation**Navigation**

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

Description

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

User entry

0 to 65 535

Factory setting

0

Batch phase**Navigation**

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

Description

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

User entry

0 to 65 535

Factory setting

0

Batch Recipe

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

PVscale lo range

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

PVscale up range

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

Out scale low

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

User entry Signed floating-point number

Factory setting 0

Out scale up



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

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

User entry Signed floating-point number

Factory setting 100.0

Lin type



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

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

Selection Off

Factory setting Off

Out unit



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

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

User entry 0 to 65 535

Factory setting 1997

Out dec_point



Navigation ☐ Expert → Analog inputs → Analog input 1 to n → Out dec_point (1547–1 to n)

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

User entry 0 to 7

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

Alarm hysteresis



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

Hi Hi Lim



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

Hi Lim



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

Additional information*Description*

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

User entry

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

Lo Lim**Navigation**

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

Description

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

User entry

Signed floating-point number

Factory setting

Negative floating-point number

Additional information*Description*

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

User entry

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

Lo Lo Lim**Navigation**

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

Description

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

User entry

Signed floating-point number

Factory setting

Negative floating-point number

Additional information*Description*

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

User entry

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

HiHi alarm value

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

HiHi alarm state

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

Hi alarm value

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

Hi alarm state

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

Lo alarm value

| | |
|-----------------------|---|
| Navigation |  Expert → Analog inputs → Analog input 1 to n → Lo alarm value (1543–1 to n) |
| Description | Displays the alarm value for the lower warning limit value (Lo Lim parameter (→ 172)). |
| User interface | Signed floating-point number |

Lo alarm state

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

LoLo alarm value

| | |
|-----------------------|---|
| Navigation |  Expert → Analog inputs → Analog input 1 to n → LoLo alarm value (1545–1 to n) |
| Description | Displays the alarm value for the lower alarm limit value (Lo Lo Lim parameter (→ 172)). |
| User interface | Signed floating-point number |

LoLo alarm state

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

Simulate enabled

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

Simulate value

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

Simulate status

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

Out unit text**Navigation**

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

Description

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

User entry

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

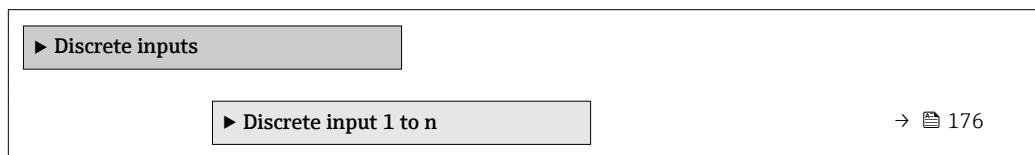
Factory setting

NoUnit

3.8 "Discrete inputs" submenu

Navigation

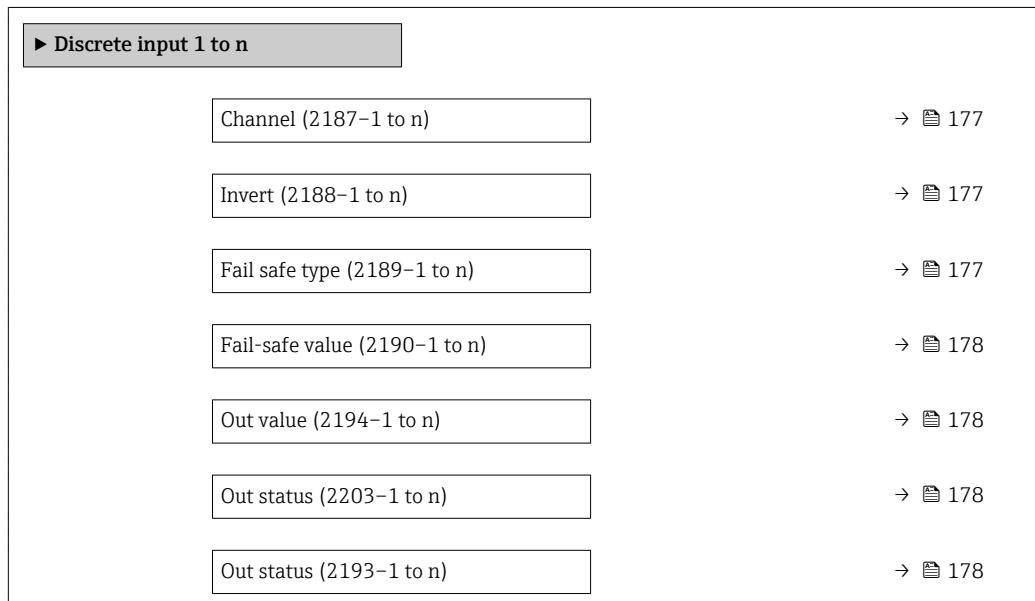
█ █ Expert → Discrete inputs



3.8.1 "Discrete input 1 to n" submenu

Navigation

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



Channel

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

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

Selection

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

Factory setting Empty pipe det.

Invert

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

Description Use this function to invert the input signal.

Selection

- Off
- On

Factory setting Off

Fail safe type

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

Description Use this function to select the failure mode.

Selection

- Fail-safe value
- Fallback value
- Off

Factory setting Off

Additional information *Selection*

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

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

* Visibility depends on order options or device settings

Fail-safe value

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

Out value

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

Out status

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

Out status

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

Tag description

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

Static revision

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

Strategy

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

Alert key

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

Target mode



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

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

User interface

- Auto
- Man
- Out of service

Mode block act

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

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

User interface

- Auto
- Man
- Out of service

Additional information

Description

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

Mode block perm

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

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

User interface

0 to 255

Mode blk norm

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

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

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

Alarm summary

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

Batch ID

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

Batch operation

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

Batch phase

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

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

User entry 0 to 65 535

Factory setting 0

Batch Recipe

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

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

User entry 0 to 65 535

Factory setting 0

Additional information *Description*

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

Simulate enabled

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

Description Use this function to enable or disable block simulation.

Selection

- Disable
- Enable

Factory setting Disable

Additional information *Description*

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

Simulate value

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

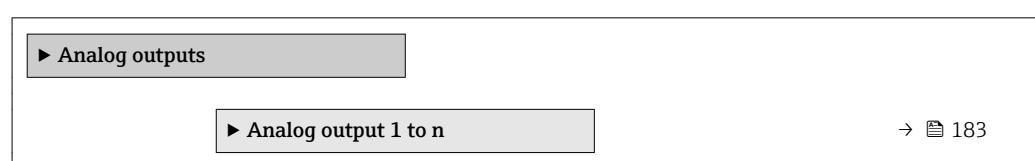
Simulate status

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

3.9 "Analog outputs" submenu

Navigation

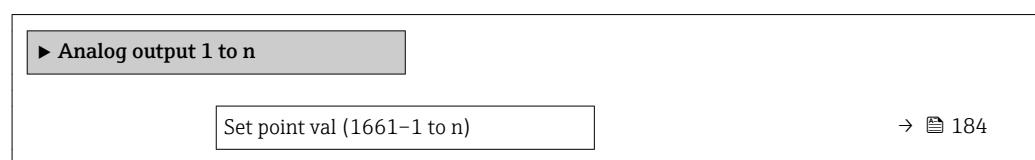
☒ ☒ Expert → Analog outputs



3.9.1 "Analog output 1 to n" submenu

Navigation

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



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

Set point val

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

Description Use this function to enter an analog set point.

User entry Signed floating-point number

Factory setting 0

Set point status

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

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

User entry 0 to 255

Factory setting 0

Fail safe time

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

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

User entry 0 to 999.0

Factory setting 0

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

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

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

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

Use this function to select the failure mode.

Selection

- Fail-safe value
- Fallback value
- Off

Factory setting

Fallback value

Additional information

Selection

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

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

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

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

Description

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

User entry

Signed floating-point number

Factory setting

0

Out value

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

Out status

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

Out status

| | |
|-----------------------|---|
| Navigation |   Expert → Analog outputs → Analog output 1 to n → Out status (1645–1 to n) |
| Prerequisite | In Target mode parameter (→ 187), the Auto option is selected. |
| Description | Displays the current output status (hex value). |
| User interface | 0 to 0xFF |

Tag description



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

Static revision

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

Strategy



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

Alert key



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

Target mode



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

User interface

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

Mode block act

Navigation

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

Description

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

User interface

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

Additional information**Description**

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

Mode block perm

Navigation

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

Description

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

User interface

0 to 255

Mode blk norm

Navigation

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

Description

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

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

Alarm summary

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

Batch ID

| | |
|--------------------|---|
| Navigation |  Expert → Analog outputs → Analog output 1 to n → Batch ID (1633–1 to n) |
| Description | Use this function to enter the batch ID: identification of a specific batch to make it possible to assign device-specific information (e.g. errors, alarm conditions etc.) to the batching process. |
| User entry | Positive integer |

Batch operation

| | |
|------------------------|--|
| Navigation |  Expert → Analog outputs → Analog output 1 to n → Batch operation (1639–1 to n) |
| Description | Use this function to enter the batch operation: control recipe operation number to identify the active control recipe operation. |
| User entry | 0 to 65 535 |
| Factory setting | 0 |

Batch phase

| | |
|------------------------|--|
| Navigation | Expert → Analog outputs → Analog output 1 to n → Batch phase (1640–1 to n) |
| Description | Use this function to enter the batch phase: control recipe phase number to identify the active control recipe operation. |
| User entry | 0 to 65 535 |
| Factory setting | 0 |

Batch Recipe

| | |
|-------------------------------|--|
| Navigation | Expert → Analog outputs → Analog output 1 to n → Batch Recipe (1641–1 to n) |
| Description | Use this function to enter the batch recipe unit procedure (RUP): identification of the active control recipe unit procedure or the associated unit (e.g. inductor, centrifuge, drying agent). |
| User entry | 0 to 65 535 |
| Factory setting | 0 |
| Additional information | Description The unit is defined in IEC61512 Part1/ISA S88 but its meaning is different to that of the parameter unit, such as system units. |

PVscl lo range

| | |
|------------------------|--|
| Navigation | Expert → Analog outputs → Analog output 1 to n → PVscale lo range (1651–1 to n) |
| Description | Use this function to enter the lower value range for the input value (Process Value Scale) in system units. The process value scale normalizes the input value to a user-specific range. |
| User entry | Signed floating-point number |
| Factory setting | 0 |

PVscale up range

| | |
|------------------------|--|
| Navigation | Expert → Analog outputs → Analog output 1 to n → PVscale up range (1652–1 to n) |
| Description | Use this function to enter the upper value range for the input value (Process Value Scale) in system units. The process value scale normalizes the input value to a user-specific range. |
| User entry | Signed floating-point number |
| Factory setting | 100.0 |

Readback value

| | |
|-----------------------|--|
| Navigation | Expert → Analog outputs → Analog output 1 to n → Readback value (1659–1 to n) |
| Description | Displays the readback value. The readback value indicates the current position of the control element within the travel range (between the open and close position) in PV scale units. |
| User interface | Signed floating-point number |

Readback status

| | |
|-----------------------|---|
| Navigation | Expert → Analog outputs → Analog output 1 to n → Readback status (1658–1 to n) |
| Description | Displays the readback status. The readback status contains the status information of the slave. |
| User interface | 0 to 255 |

RCAS in value

| | |
|------------------------|---|
| Navigation | Expert → Analog outputs → Analog output 1 to n → RCAS in value (1655–1 to n) |
| Description | Use this function to enter the RCAS (Remote Cascade) in value. The block set point is set by a control application via the remote cascade RCAS in value parameter (→ 191). The normal algorithm calculates the output value of the block on the basis of this set point. |
| User entry | Signed floating-point number |
| Factory setting | 0 |

RCAS in status

| | |
|------------------------|--|
| Navigation | Expert → Analog outputs → Analog output 1 to n → RCAS in status (1654-1 to n) |
| Description | Use this function to enter the RCAS (Remote Cascade) in status. Defines the status for the RCAS in value (→ 191). |
| User entry | 0 to 255 |
| Factory setting | 0 |

Input channel

| | |
|------------------------|--|
| Navigation | Expert → Analog outputs → Analog output 1 to n → Input channel (1670-1 to n) |
| Description | Use this function to select the input channel. The number of logical hardware channels from the converter that is connected to this I/O block. |
| Selection | None |
| Factory setting | None |

Output channel

| | |
|------------------------|---|
| Navigation | Expert → Analog outputs → Analog output 1 to n → Output channel (1671-1 to n) |
| Description | Use this function to select the output channel. The number of logical hardware channels to the converter that is connected to this I/O block. |
| Selection | <ul style="list-style-type: none">■ External temp.■ Ext. ref.density■ External press.■ S&W■ Water cut |
| Factory setting | External press. |

RCAS out value

| | |
|--------------------|---|
| Navigation | Expert → Analog outputs → Analog output 1 to n → RCAS out value (1657-1 to n) |
| Description | Displays the RCAS out value. Displays the set point of the block which is made available to the higher-level host for monitoring/back calculation and which makes it possible to take action under certain conditions or in a different mode. |

| | |
|----------------|------------------------------|
| User interface | Signed floating-point number |
|----------------|------------------------------|

RCAS out status

| | |
|----------------|--|
| Navigation |  Expert → Analog outputs → Analog output 1 to n → RCAS out status (1656–1 to n) |
| Description | Displays the RCAS out status. Displays the status of the set point. |
| User interface | 0 to 0xFF |

Pos value

| | |
|----------------|--|
| Navigation |  Expert → Analog outputs → Analog output 1 to n → Pos value (1650–1 to n) |
| Description | Displays the current value of the positioner. |
| User interface | 0 to 255 |

Position status

| | |
|----------------|--|
| Navigation |  Expert → Analog outputs → Analog output 1 to n → Position status (1649–1 to n) |
| Description | Displays the current status of the positioner. |
| User interface | 0 to 255 |

Setp. deviation

| | |
|----------------|---|
| Navigation |  Expert → Analog outputs → Analog output 1 to n → Setp. deviation (1653–1 to n) |
| Description | Displays the deviation between the set point (Set point val parameter (→  184)) and the actual value (Readback value parameter (→  191)). |
| User interface | Signed floating-point number |

Simulate enabled

| | |
|-------------|---|
| Navigation |  Expert → Analog outputs → Analog output 1 to n → Simulate enabled (1662–1 to n) |
| Description | Use this function to enable or disable block simulation. |

| | |
|-------------------------------|--|
| Selection | <ul style="list-style-type: none">■ Disable■ Enable |
| Factory setting | Disable |
| Additional information | <i>Description</i> The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated discrete I/O channel during operation. |

Simulate value █

| | |
|-------------------------------|---|
| Navigation |  Expert → Analog outputs → Analog output 1 to n → Simulate value (1664–1 to n) |
| Description | Use this function to enter a simulation value. |
| User entry | Signed floating-point number |
| Factory setting | 0 |
| Additional information | <i>Description</i> The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated value during operation. |

Simulate status █

| | |
|-------------------------------|--|
| Navigation |  Expert → Analog outputs → Analog output 1 to n → Simulate status (1663–1 to n) |
| Description | Use this function to enter a simulation status for the block. |
| User entry | 0 to 255 |
| Factory setting | 0 |
| Additional information | <i>Description</i> The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated status during operation. |

Increase close █

| | |
|--------------------|---|
| Navigation |  Expert → Analog outputs → Analog output 1 to n → Increase close (1638–1 to n) |
| Description | Use this function to enter the effective direction of the positioner in automatic mode. |
| User entry | 0 to 255 |

Factory setting 0

Out scale up

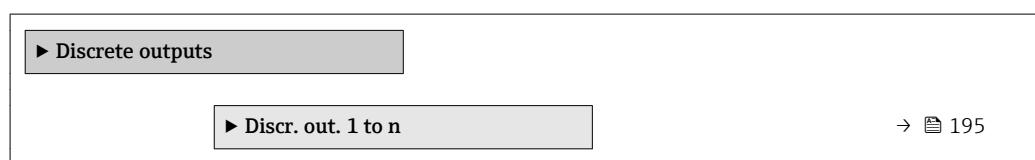
| | |
|------------------------|--|
| Navigation | Expert → Analog outputs → Analog output 1 to n → Out scale up (1646–1 to n) |
| Description | Use this function to enter the upper value range for the output value in system units. |
| User entry | Signed floating-point number |
| Factory setting | 100.0 |

Out scale low

| | |
|------------------------|--|
| Navigation | Expert → Analog outputs → Analog output 1 to n → Out scale low (1644–1 to n) |
| Description | Use this function to enter the lower value range for the output value in system units. |
| User entry | Signed floating-point number |
| Factory setting | 0 |

3.10 "Discrete outputs" submenu

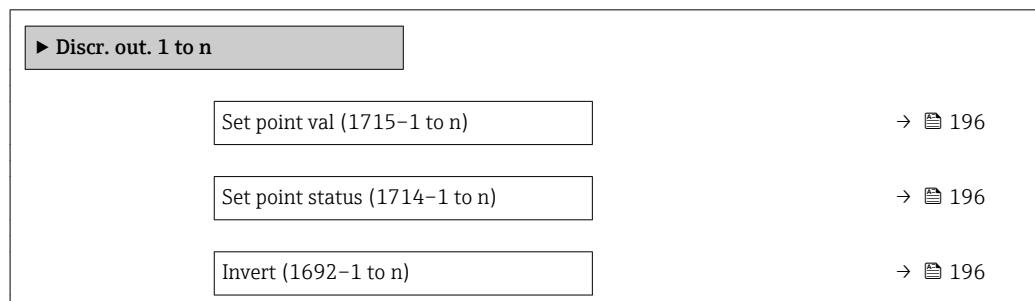
Navigation Expert → Discrete outputs



→ 195

3.10.1 "Discrete output 1 to n" submenu

Navigation Expert → Discrete outputs → Discr. out. 1 to n



| | |
|-------------------------------|--------|
| Fail safe time (1697–1 to n) | → 197 |
| Fail safe type (1696–1 to n) | → 197 |
| Fail-safe value (1693–1 to n) | → 198 |
| Out value (1704–1 to n) | → 198 |
| Out status (1723–1 to n) | → 198 |
| Out status (1703–1 to n) | → 198 |

Set point val

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Set point val (1715–1 to n)

Description Use this function to enter an analog set point.

User entry 0 to 255

Factory setting 0

Set point status

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Set point status (1714–1 to n)

Description Use this function to enter a status for the analog set point.

User entry 0 to 255

Factory setting 0

Invert

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Invert (1692–1 to n)

Description Use this function to switch inversion on and off. Specifies whether the set point should be inverted before the value is set as the output value or the RCAS value (in the automatic mode).

Selection

- Off
- On

Factory setting Off

Fail safe time

| | |
|-------------------------------|---|
| Navigation | Expert → Discrete outputs → Discr. out. 1 to n → Fail safe time (1697–1 to n) |
| Description | Use this function to enter a time span within which the criteria for an error must be met continuously before an error message or notice message is generated. |
| User entry | Signed floating-point number |
| Factory setting | 0 |
| Additional information | <i>User entry</i> NOTE! If this parameter is used, error messages and notice messages are delayed by the set time before being relayed to the higher-level controller (DCS, etc.). <ul style="list-style-type: none">▶ Check in advance to ensure that the safety-specific requirements of the process would permit this.▶ If the error and notice messages may not be suppressed, a value of 0 seconds must be configured here. |

Fail safe type

| | |
|-------------------------------|--|
| Navigation | Expert → Discrete outputs → Discr. out. 1 to n → Fail safe type (1696–1 to n) |
| Description | Use this function to select the failure mode. |
| Selection | <ul style="list-style-type: none">■ Fail-safe value■ Fallback value■ Off |
| Factory setting | Fallback value |
| Additional information | <i>Selection</i> If an input or simulation value has the status BAD, the function block uses this predefined failure value: <ul style="list-style-type: none">■ Fail-safe value A substitute value is used. This is specified in the Fail-safe value parameter (→ 198).■ Fallback value If the value was good at one point, then this last valid value is used.■ Off The system continues to use the bad value. |

Fail-safe value

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Fail-safe value (1693–1 to n)

Prerequisite In **Fail safe type** parameter (→ 197), the **Fail-safe value** option is selected.

Description Use this function to enter a failure value. The value entered is displayed as the output value (**Out value** parameter (→ 198)) in the event of an error.

User entry 0 to 255

Factory setting 0

Out value

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Out value (1704–1 to n)

Prerequisite In **Target mode** parameter (→ 200), the **Auto** option is selected.

Description Displays the analog value which is calculated when the function is executed.

User interface 0 to 255

Out status

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Out status (1723–1 to n)

Description Displays the current output status (Good, Bad, Uncertain).

User interface

- Good
- Uncertain
- Bad

Out status

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Out status (1703–1 to n)

Prerequisite In **Target mode** parameter (→ 200), the **Auto** option is selected.

Description Displays the current output status (hex value).

User interface 0 to 0xFF

Tag description

| | |
|--------------------|---|
| Navigation | Expert → Discrete outputs → Discr. out. 1 to n → Tag description (1721–1 to n) |
| Description | Use this function to enter a string to identify the block. |
| User entry | Max. 32 characters such as letters, numbers or special characters (e.g. @, %, /). |

Static revision

| | |
|-------------------------------|--|
| Navigation | Expert → Discrete outputs → Discr. out. 1 to n → Static revision (1720–1 to n) |
| Description | Displays the event counter: every write access to a static block parameter is counted. |
| User interface | 0 to FFFF |
| Additional information | <i>Description</i> |
| | Static parameters are parameters that are not changed by the process. |

Strategy

| | |
|------------------------|---|
| Navigation | Expert → Discrete outputs → Discr. out. 1 to n → Strategy (1719–1 to n) |
| Description | Use this function to enter the strategy: makes it possible to group blocks by entering identical numbers. |
| User entry | 0 to FFFF |
| Factory setting | 0 |

Alert key

| | |
|------------------------|---|
| Navigation | Expert → Discrete outputs → Discr. out. 1 to n → Alert key (1694–1 to n) |
| Description | Use this function to enter the alert key: identifies the section of the plant where the transmitter is located. This helps in pinpointing events. |
| User entry | 0 to 0xFF |
| Factory setting | 0 |

Target mode



Navigation Expert → Discrete outputs → Discr. out. 1 to n → Target mode (1722-1 to n)

Description Displays the Target mode: The target mode specifies which mode of operation is used for this function block. This mode is generally set by a control application.

User interface

- Local override
- Remote Cascaded
- Man
- Out of service
- Auto

Mode block act

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Mode block act (1691-1 to n)

Description Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→ 200).

User interface

- Local override
- Remote Cascaded
- Man
- Out of service
- Auto

Additional information

Description

A comparison of the current mode with the target mode (**Target mode** parameter (→ 200)) indicates whether it was possible to reach the target mode.

Mode block perm

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Mode block perm (1705-1 to n)

Description Displays the Mode block perm: This defines which modes of operation in the Target mode (→ 200) are available for the function block. The operating modes that are supported vary depending on the type and function of the block.

User interface

0 to 255

Mode blk norm

| | |
|-----------------------|--|
| Navigation |  Expert → Discrete outputs → Discr. out. 1 to n → Mode blk norm (1702–1 to n) |
| Description | Displays the Mode blk norm: This is available to allow the operator to select the Mode blk norm from the available modes of operation. This can be set using an operating tool in order to help the user configure the operating mode of a function block. |
| User interface | <ul style="list-style-type: none">■ Local override■ Remote Cascaded■ Man■ Out of service■ Auto |

Alarm summary

| | |
|-------------------------------|---|
| Navigation |  Expert → Discrete outputs → Discr. out. 1 to n → Alarm summary (1701–1 to n) |
| Description | Displays the alarm summary: the current status of the block alarms is displayed. A summary of up to 16 statuses can be displayed. |
| User interface | <ul style="list-style-type: none">■ Discrete alarm■ Alm statHiHi lim■ Alrm stat Hi lim■ Alm statLoLo lim■ Alrm stat Lo lim■ Update Event |
| Additional information | <i>Description</i>  Currently, the system only displays a change in a static parameter for 10 seconds, and violations of the early warning and alarm limits in the Discrete Outputs function block. |

Batch ID



| | |
|--------------------|---|
| Navigation |  Expert → Discrete outputs → Discr. out. 1 to n → Batch ID (1695–1 to n) |
| Description | Use this function to enter the batch ID: identification of a specific batch to make it possible to assign device-specific information (e.g. errors, alarm conditions etc.) to the batching process. |
| User entry | Positive integer |

Batch operation

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Batch operation (1698–1 to n)

Description Use this function to enter the batch operation: control recipe operation number to identify the active control recipe operation.

User entry 0 to 65 535

Factory setting 0

Batch phase

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Batch phase (1699–1 to n)

Description Use this function to enter the batch phase: control recipe phase number to identify the active control recipe operation.

User entry 0 to 65 535

Factory setting 0

Batch Recipe

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Batch Recipe (1700–1 to n)

Description Use this function to enter the batch recipe unit procedure (RUP): identification of the active control recipe unit procedure or the associated unit (e.g. inductor, centrifuge, drying agent).

User entry 0 to 65 535

Factory setting 0

Additional information *Description*



The unit is defined in IEC61512 Part1/ISA S88 but its meaning is different to that of the parameter unit, such as system units.

Readback value

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Readback value (1713–1 to n)

Description Displays the readback value. The readback value indicates the current position of the control element and the element's sensors.

| | |
|-----------------------|----------|
| User interface | 0 to 255 |
|-----------------------|----------|

Readback status

| | |
|-----------------------|--|
| Navigation |  Expert → Discrete outputs → Discr. out. 1 to n → Readback status (1712–1 to n) |
| Description | Displays the readback status. Displays the status of the readback value. |
| User interface | 0 to 255 |

RCAS in value

| | |
|------------------------|---|
| Navigation |  Expert → Discrete outputs → Discr. out. 1 to n → RCAS in value (1707–1 to n) |
| Description | Use this function to enter the RCAS (Remote Cascade) in value. The block set point is set by a control application via the remote cascade RCAS in value parameter (→  203). The normal algorithm calculates the output value of the block on the basis of this set point. |
| User entry | 0 to 255 |
| Factory setting | 0 |

RCAS in status

| | |
|------------------------|---|
| Navigation |  Expert → Discrete outputs → Discr. out. 1 to n → RCAS in status (1706–1 to n) |
| Description | Use this function to enter the RCAS (Remote Cascade) in status. Defines the status for the RCAS in value (→  203). |
| User entry | 0 to 255 |
| Factory setting | 0 |

Input channel

| | |
|------------------------|--|
| Navigation |  Expert → Discrete outputs → Discr. out. 1 to n → Input channel (1724–1 to n) |
| Description | Use this function to select the input channel. The number of logical hardware channels from the converter that is connected to this I/O block. |
| Selection | None |
| Factory setting | None |

Output channel

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Output channel (1725–1 to n)

Description Use this function to select the output channel. The number of logical hardware channels to the converter that is connected to this I/O block.

Selection

- Start verificat.*
- Zero point adj.
- Flow override
- I/O module 2
- I/O module 3
- I/O module 4
- Liqu. type conc.

Factory setting Flow override

RCAS out value

Navigation Expert → Discrete outputs → Discr. out. 1 to n → RCAS out value (1711–1 to n)

Description Displays the RCAS out value. Displays the set point of the block which is made available to the higher-level host for monitoring/back calculation and which makes it possible to take action under certain conditions or in a different mode.

User interface 0 to 255

RCAS out status

Navigation Expert → Discrete outputs → Discr. out. 1 to n → RCAS out status (1708–1 to n)

Description Displays the RCAS out status. Displays the status of the set point.

User interface 0 to 255

Simulate enabled

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Simulate enabled (1716–1 to n)

Description Use this function to enable or disable block simulation.

Selection

- Disable
- Enable

* Visibility depends on order options or device settings

Factory setting Disable

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated discrete I/O channel during operation.

Simulate value



Navigation Expert → Discrete outputs → Discr. out. 1 to n → Simulate value (1718-1 to n)

Description Use this function to enter a simulation value.

User entry 0 to 255

Factory setting 0

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated value during operation.

Simulate status



Navigation Expert → Discrete outputs → Discr. out. 1 to n → Simulate status (1717-1 to n)

Description Use this function to enter a simulation status for the block.

User entry 0 to 255

Factory setting 0

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated status during operation.

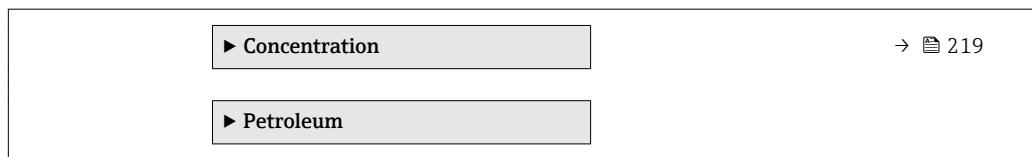
3.11 "Application" submenu

Navigation Expert → Application

► Application

► Totalizer 1 to n

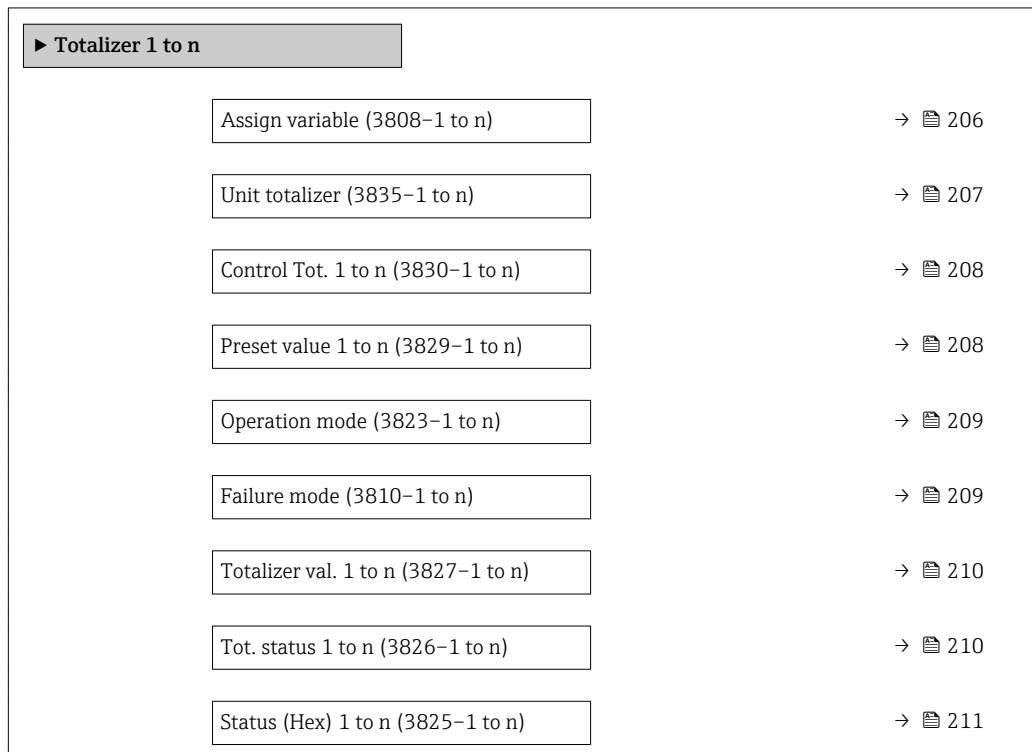
→ 206



3.11.1 "Totalizer 1 to n" submenu

Navigation

Expert → Application → Totalizer 1 to n



Assign variable



Navigation

Expert → Application → Totalizer 1 to n → Assign variable (3808-1 to n)

Description

Use this function to select a process variable for the Totalizer 1 to n.

Selection

- Mass flow
- Volume flow
- Correct.vol.flow *
- Target mass flow *
- Carrier mass fl. *
- Target vol. flow *
- Carrier vol. fl. *
- Targ.corr.vol.fl *
- Carr.corr.vol.fl *

Factory setting

Mass flow

* Visibility depends on order options or device settings

Additional information*Description*

If the option selected is changed, the device resets the totalizer to 0.

Unit totalizer**Navigation**

Expert → Application → Totalizer 1 to n → Unit totalizer (3835-1 to n)

Description

Use this function to select the process variable of a totalizer.

The unit is selected separately for each totalizer. It is independent of the selection made in the **System units** submenu (→ 58).

Selection*SI units*

- g *
- kg *
- t

US units

- oz *
- lb *
- STon *

* Visibility depends on order options or device settings

or

SI units

- 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) *

* Visibility depends on order options or device settings

or

US units

- bbl (us;liq.) *
- bbl (us;beer) *

Imperial units

- bbl (imp;beer) *

* Visibility depends on order options or device settings

or

SI units

- Nl *
- Nm³ *
- Sl *
- Sm³ *

US units

- Sft³ *
- Sgal (us) *
- Sbbl (us;liq.) *

Imperial units

- Sgal (imp) *

* Visibility depends on order options or device settings

| | |
|-------------------------------|--|
| Factory setting | Country-specific: ■ kg ■ lb |
| Additional information | <i>Selection</i> The selection is independent of the process variable selected in the Assign variable parameter (→ 206). <i>Dependency</i> The following parameters depend on the option selected: ■ Alarm hysteresis parameter (→ 215) ■ Hi Hi Lim parameter (→ 215) ■ Hi Lim parameter (→ 216) ■ Lo Lim parameter (→ 216) ■ Lo Lo Lim parameter (→ 217) ■ Totalizer val. parameter (→ 52) ■ Preset value parameter (→ 208) |

Control Tot. 1 to n

| | |
|-------------------------------|--|
| Navigation | Expert → Application → Totalizer 1 to n → Control Tot. 1 to n (3830–1 to n) |
| Description | Use this function to select the control of totalizer value 1-3. |
| Selection | ■ Totalize ■ Reset + hold ■ Preset + hold |
| Factory setting | Totalize |
| Additional information | <i>Selection</i> ■ Totalize The totalizer is started or continues totalizing with the current counter reading. ■ 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. |

Preset value 1 to n

| | |
|--------------------|---|
| Navigation | Expert → Application → Totalizer 1 to n → Preset value 1 to n (3829–1 to n) |
| Description | Use this function to enter an initial value for the specific totalizer. |
| User entry | Signed floating-point number |

| | |
|-------------------------------|--|
| Factory setting | Country-specific: ■ kg ■ lb |
| Additional information | <p><i>User entry</i></p> <p> The unit of the selected process variable is specified for the totalizer in the Unit totalizer parameter (→ 207).</p> <p><i>Example</i></p> <p>This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.</p> |

Operation mode

| | |
|-------------------------------|--|
| Navigation |  Expert → Application → Totalizer 1 to n → Operation mode (3823-1 to n) |
| 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 ■ Last valid value |
| Factory setting | Net flow total |
| Additional information | <p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Net flow total Positive and negative flow values are totalized and balanced against one another. Net flow is registered in the flow direction. ■ Forward total Only the flow in the forward flow direction is totalized. ■ Reverse total Only the flow against the forward flow direction is totalized (= reverse flow total). ■ Last valid value The value is frozen. Totaling is stopped. |

Failure mode

| | |
|------------------------|--|
| Navigation |  Expert → Application → Totalizer 1 to n → Failure mode (3810-1 to n) |
| 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 | Actual value |

Additional information*Description*

This setting does not affect the failsafe mode of other totalizers and the outputs. This is specified in separate parameters.

Selection

- Stop

Totalizing is stopped when a device alarm occurs.

- Actual value

The totalizer continues to count based on the current measured value; the device alarm is ignored.

- Last valid value

The totalizer continues to count based on the last valid measured value before the device alarm occurred.

Totalizer val. 1 to n**Navigation**

Expert → Application → Totalizer 1 to n → Totalizer val. 1 to n (3827-1 to n)

Prerequisite

In the **Target mode** parameter (→ 212), the **Auto** option is selected.

Description

Displays the current reading for totalizer 1-3.

User interface

Signed floating-point number

Additional information*Description*

In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→ 209).

User interface

The value of the process variable totalized since measuring began can be positive or negative. This depends on the settings in the **Operation mode** parameter (→ 209).

Dependency

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 207).

Tot. status 1 to n**Navigation**

Expert → Application → Totalizer 1 to n → Tot. status 1 to n (3826-1 to n)

Description

Displays the status of the particular totalizer.

User interface

- Good
- Uncertain
- Bad

Status (Hex) 1 to n

| | |
|-----------------------|---|
| Navigation |   Expert → Application → Totalizer 1 to n → Status (Hex) 1 to n (3825–1 to n) |
| Prerequisite | In Target mode parameter (→ 212), the Auto option is selected. |
| Description | Displays the status value (hex) of the particular totalizer. |
| User interface | 0 to 0xFF |

Tag description



| | |
|--------------------|---|
| Navigation |  Expert → Application → Totalizer 1 to n → Tag description (3833–1 to n) |
| Description | Use this function to enter a string to identify the block. |
| User entry | Max. 32 characters such as letters, numbers or special characters (e.g. @, %, /). |

Static revision

| | |
|-------------------------------|---|
| Navigation |  Expert → Application → Totalizer 1 to n → Static revision (3832–1 to n) |
| Description | Displays the event counter: every write access to a static block parameter is counted. |
| User interface | 0 to FFFF |
| Additional information | <i>Description</i> |
| |  Static parameters are parameters that are not changed by the process. |

Strategy



| | |
|------------------------|--|
| Navigation |  Expert → Application → Totalizer 1 to n → Strategy (3831–1 to n) |
| Description | Use this function to enter the strategy: makes it possible to group blocks by entering identical numbers. |
| User entry | 0 to FFFF |
| Factory setting | 0 |

Alert key**Navigation**

█ Expert → Application → Totalizer 1 to n → Alert key (3803-1 to n)

Description

Use this function to enter the alert key: identifies the section of the plant where the transmitter is located. This helps in pinpointing events.

User entry

0 to 0xFF

Factory setting

0

Target mode**Navigation**

█ Expert → Application → Totalizer 1 to n → Target mode (3834-1 to n)

Description

Displays the Target mode: The target mode indicates which mode of operation is used for this function block. This mode is generally set by a control application.

User interface

- Auto
- Man
- Out of service

Mode block act**Navigation**

█ Expert → Application → Totalizer 1 to n → Mode block act (3801-1 to n)

Description

Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→ 212).

User interface

- Auto
- Man
- Out of service

Additional information**Description**

A comparison of the current mode with the target mode (**Target mode** parameter (→ 212)) indicates whether it was possible to reach the target mode.

Mode block perm

| | |
|-----------------------|--|
| Navigation |  Expert → Application → Totalizer 1 to n → Mode block perm (3828-1 to n) |
| Description | Displays the Mode block perm: This defines which modes of operation in the Target mode (→ 212) are available for the function block. The operating modes that are supported vary depending on the type and function of the block. |
| User interface | 0 to 255 |

Mode blk norm

| | |
|-----------------------|--|
| Navigation |  Expert → Application → Totalizer 1 to n → Mode blk norm (3824-1 to n) |
| Description | Displays the Mode blk norm: This is available to allow the operator to select the Mode blk norm from the available modes of operation. This can be set using an operating tool in order to help the user configure the operating mode of a function block. |
| User interface | <ul style="list-style-type: none">■ Auto■ Man■ Out of service |

Alarm summary

| | |
|-------------------------------|---|
| Navigation |  Expert → Application → Totalizer 1 to n → Alarm summary (3809-1 to n) |
| Description | Displays the alarm summary: the current status of the block alarms is displayed. A summary of up to 16 statuses can be displayed. |
| User interface | <ul style="list-style-type: none">■ Discrete alarm■ Alm statHiHi lim■ Alrm stat Hi lim■ Alm statLoLo lim■ Alrm stat Lo lim■ Update Event |
| Additional information | <p><i>Description</i></p> <p> Currently, the system only displays a change in a static parameter for 10 seconds, and violations of the early warning and alarm limits in the Totalizer function block.</p> |

Batch ID**Navigation**

█ Expert → Application → Totalizer 1 to n → Batch ID (3804–1 to n)

Description

Use this function to enter the batch ID: identification of a specific batch to make it possible to assign device-specific information (e.g. errors, alarm conditions etc.) to the batching process.

User entry

Positive integer

Factory setting

0

Batch operation**Navigation**

█ Expert → Application → Totalizer 1 to n → Batch operation (3805–1 to n)

Description

Use this function to enter the batch operation: control recipe operation number to identify the active control recipe operation.

User entry

0 to 65 535

Factory setting

0

Batch phase**Navigation**

█ Expert → Application → Totalizer 1 to n → Batch phase (3806–1 to n)

Description

Use this function to enter the batch phase: control recipe phase number to identify the active control recipe operation.

User entry

0 to 65 535

Factory setting

0

Batch Recipe**Navigation**

█ Expert → Application → Totalizer 1 to n → Batch Recipe (3807–1 to n)

Description

Use this function to enter the batch recipe unit procedure (RUP): identification of the active control recipe unit procedure or the associated unit (e.g. inductor, centrifuge, drying agent).

User entry

0 to 65 535

Factory setting

0

Additional information *Description*

 The unit is defined in IEC61512 Part1/ISA S88 but its meaning is different to that of the parameter unit, such as system units.

Alarm hysteresis

Navigation  Expert → Application → Totalizer 1 to n → Alarm hysteresis (3802–1 to n)

Description Use this function to enter the hysteresis value for the upper and lower warning or alarm limit values.

User entry Signed floating-point number

Factory setting 0 kg

Additional information *User entry*

 The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ [207](#)).

Hi Hi Lim

Navigation  Expert → Application → Totalizer 1 to n → Hi Hi Lim (3815–1 to n)

Description Use this function to enter the value for the upper alarm limit of the totalizer (**HiHi alarm value** parameter (→ [217](#))).

User entry Signed floating-point number

Factory setting Positive floating-point number

Additional information *Description*

 If the output value Out value (→ [165](#)) exceeds this limit value, the **HiHi alarm state** parameter (→ [217](#)) is output.

User entry

 The value is entered in the defined units (**Out unit** parameter (→ [170](#))) and must be in the range defined in the **Out scale low** parameter (→ [169](#)) and **Out scale up** parameter (→ [170](#)).

 The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ [207](#)).

Hi Lim**Navigation**

█ Expert → Application → Totalizer 1 to n → Hi Lim (3816–1 to n)

Description

Use this function to enter the value for the upper warning limit of the totalizer (**Hi alarm value** parameter (→ 218)).

User entry

Signed floating-point number

Factory setting

Positive floating-point number

Additional information*Description*

i If the output value Out value (→ 165) exceeds this limit value, the **Hi alarm state** parameter (→ 218) is output.

User entry

i The value is entered in the defined units (**Out unit** parameter (→ 170)) and must be in the range defined in the **Out scale low** parameter (→ 169) and **Out scale up** parameter (→ 170).

i The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 207).

Lo Lim**Navigation**

█ Expert → Application → Totalizer 1 to n → Lo Lim (3819–1 to n)

Description

Use this function to enter the value for the lower warning limit of the totalizer (**Lo alarm value** parameter (→ 218)).

User entry

Signed floating-point number

Factory setting

Negative floating-point number

Additional information*Description*

i If the output value Out value (→ 165) exceeds this limit value, the **Lo alarm state** parameter (→ 218) is output.

User entry

i The value is entered in the defined units (**Out unit** parameter (→ 170)) and must be in the range defined in the **Out scale low** parameter (→ 169) and **Out scale up** parameter (→ 170).

i The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 207).

Lo Lo Lim

Navigation Expert → Application → Totalizer 1 to n → Lo Lo Lim (3822–1 to n)

Description Use this function to enter the value for the lower alarm limit of the totalizer (**LoLo alarm value** parameter (→ [219\)\).](#)

User entry Signed floating-point number

Factory setting Negative floating-point number

Additional information *Description*

If the output value Out value (→ [165\) exceeds this limit value, the LoLo alarm state parameter \(→ \[219\\) is output.\]\(#\)](#)

User entry

The value is entered in the defined units (**Out unit** parameter (→ [170\)\) and must be in the range defined in the **Out scale low** parameter \(→ \[169\\) and **Out scale up** parameter \\(→ \\[170\\\).\\]\\(#\\)\]\(#\)](#)

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ [207\).](#)

HiHi alarm value

Navigation Expert → Application → Totalizer 1 to n → HiHi alarm value (3814–1 to n)

Description Displays the alarm value for the upper alarm limit value (**Hi Hi Lim** parameter (→ [215\)\).](#)

User interface Signed floating-point number

HiHi alarm state

Navigation Expert → Application → Totalizer 1 to n → HiHi alarm state (3813–1 to n)

Description Displays the status for the upper alarm limit value (**Hi Hi Lim** parameter (→ [215\)\).](#)

User interface

- No alarm
- Alm statHiHi lim

Additional information *User interface*

The display contains information such as the time of the alarm (date and time) and the value that triggered the alarm.

Hi alarm value

| | |
|-----------------------|--|
| Navigation |  Expert → Application → Totalizer 1 to n → Hi alarm value (3812–1 to n) |
| Description | Displays the warning value for the upper warning limit value (Hi Lim parameter (→ 216)). |
| User interface | Signed floating-point number |

Hi alarm state

| | |
|-------------------------------|---|
| Navigation |  Expert → Application → Totalizer 1 to n → Hi alarm state (3811–1 to n) |
| Description | Displays the status for the upper warning limit value (Hi Lim parameter (→ 216)). |
| User interface | <ul style="list-style-type: none">■ No warning■ Alrm stat Hi lim |
| Additional information | <i>User interface</i>  The display contains information such as the time of the warning (date and time) and the value that triggered the alarm. |

Lo alarm value

| | |
|-----------------------|--|
| Navigation |  Expert → Application → Totalizer 1 to n → Lo alarm value (3818–1 to n) |
| Description | Displays the warning value for the lower warning limit value (Lo Lim parameter (→ 216)). |
| User interface | Signed floating-point number |

Lo alarm state

| | |
|-------------------------------|---|
| Navigation |  Expert → Application → Totalizer 1 to n → Lo alarm state (3817–1 to n) |
| Description | Displays the status for the lower warning limit value (Lo Lim parameter (→ 216)). |
| User interface | <ul style="list-style-type: none">■ No warning■ Alrm stat Lo lim |
| Additional information | <i>User interface</i>  The display contains information such as the time of the warning (date and time) and the value that triggered the alarm. |

LoLo alarm value

| | |
|-----------------------|--|
| Navigation | Expert → Application → Totalizer 1 to n → LoLo alarm value (3821–1 to n) |
| Description | Displays the alarm value for the lower alarm limit value (Lo Lo Lim parameter (→ 217)). |
| User interface | Signed floating-point number |

LoLo alarm state

| | |
|-------------------------------|---|
| Navigation | Expert → Application → Totalizer 1 to n → LoLo alarm state (3820–1 to n) |
| Description | Displays the status for the lower alarm limit value (Lo Lo Lim parameter (→ 217)). |
| User interface | <ul style="list-style-type: none"> ▪ No alarm ▪ Alm statLoLo lim |
| Additional information | <p><i>User interface</i></p> <p> The display contains information such as the time of the alarm (date and time) and the value that triggered the alarm.</p> |

3.11.2 "Concentration" submenu

For detailed information on the parameter descriptions for the **Concentration** application package, refer to the Special Documentation for the device → 7

Navigation

Expert → Application → Concentration

Concentration

3.12 "Diagnostics" submenu*Navigation*

Expert → Diagnostics

Diagnostics

Actual diagnos. (0691)

→ 220

Prev.diagnostics (0690)

→ 221

Time fr. restart (0653)

→ 222

Operating time (0652)

→ 222

| | |
|--------------------|--------|
| ► Diagnostic list | → 222 |
| ► Event logbook | → 227 |
| ► Device info | → 229 |
| ► Main elec.+I/O1 | → 232 |
| ► Sens. electronic | → 233 |
| ► I/O module 1 | → 234 |
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| ► Display module | → 236 |
| ► Min/max val. | → 237 |
| ► Data logging | → 243 |
| ► Heartbeat | → 252 |
| ► Simulation | → 253 |

Actual diagnos.

Navigation

Expert → Diagnostics → Actual diagnos. (0691)

Prerequisite

A diagnostic event has occurred.

Description

Displays the current diagnostic message. If two or more messages occur simultaneously, the message with the highest priority is shown on the display.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

Additional pending diagnostic messages can be viewed in the **Diagnostic list** submenu (→ 222).

Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

Example

For the display format:

F271 Main electronics

Timestamp

| | |
|-------------------------------|---|
| 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 | <i>Display</i>  The diagnostic message can be viewed via the Actual diagnos. parameter (→  220). |
| | <i>Example</i> 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 | <i>Display</i>  Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key. |
| | <i>Example</i> For the display format: ☒F271 Main electronics |

Timestamp

| | |
|-----------------------|--|
| 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*Display*

The diagnostic message can be viewed via the **Prev.diagnostics** parameter
(→ [221](#)).

Example

For the display format:

24d12h13m00s

Time fr. restart

Navigation

Expert → Diagnostics → Time fr. restart (0653)

Description

Use this function to display the time the device has been in operation since the last device restart.

User interface

Days (d), hours (h), minutes (m) and seconds (s)

Operating time

Navigation

Expert → Diagnostics → Operating time (0652)

Description

Use this function to display the length of time the device has been in operation.

User interface

Days (d), hours (h), minutes (m) and seconds (s)

Additional information*User interface*

The maximum number of days is 9999, which is equivalent to 27 years.

3.12.1 "Diagnostic list" submenu

Navigation

Expert → Diagnostics → Diagnostic list

► Diagnostic list

Diagnostics 1 (0692)

→ [223](#)

Diagnostics 2 (0693)

→ [223](#)

Diagnostics 3 (0694)

→ [224](#)

Diagnostics 4 (0695)

→ [225](#)

Diagnostics 5 (0696)

→ [226](#)

Diagnostics 1

| | |
|-------------------------------|---|
| 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 | <i>Display</i>  Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key. |
| | <i>Examples</i> For the display format: ■  F271 Main electronics ■  F276 I/O module |

Timestamp

| | |
|-------------------------------|--|
| 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 | <i>Display</i>  The diagnostic message can be viewed via the Diagnostics 1 parameter (→  223). |
| | <i>Example</i> 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 (→  223).

Example

For the display format:

24d12h13m00s

Diagnostics 3

Navigation

 Expert → Diagnostics → Diagnostic list → Diagnostics 3 (0694)

Description

Displays the current diagnostics message with the third-highest priority.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

 Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.

Examples

For the display format:

-  F271 Main electronics
-  F276 I/O module

Timestamp

| | |
|-------------------------------|--|
| Navigation |  Expert → Diagnostics → Diagnostic list → Timestamp |
| Description | Displays the operating time when the diagnostic message with the third-highest priority occurred. |
| User interface | Days (d), hours (h), minutes (m) and seconds (s) |
| Additional information | <i>Display</i>  The diagnostic message can be viewed via the Diagnostics 3 parameter (→  224). |
| | <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 | <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 fourth-highest priority occurred. |
| User interface | Days (d), hours (h), minutes (m) and seconds (s) |

Additional information*Display*

The diagnostic message can be viewed via the **Diagnostics 4** parameter (→ 225).

Example

For the display format:
24d12h13m00s

Diagnostics 5

Navigation

Expert → Diagnostics → Diagnostic list → Diagnostics 5 (0696)

Description

Displays the current diagnostics message with the fifth-highest priority.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

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.

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 (→ 226).

Example

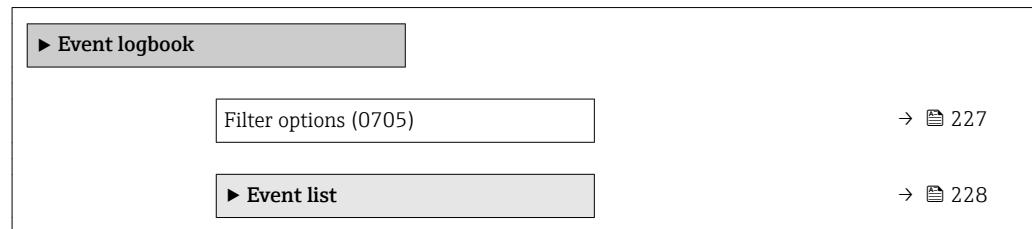
For the display format:
24d12h13m00s

3.12.2 "Event logbook" submenu

Navigation



Expert → Diagnostics → Event logbook



Filter options



Navigation



Expert → Diagnostics → Event logbook → Filter options (0705)

Description

Use this function to select the category whose event messages are displayed in the event list of the local display.

Selection

- All
- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- Information (I)

Factory setting

All

Additional information

Description



The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:

- F = Failure
- C = Function Check
- S = Out of Specification
- M = Maintenance Required

Filter options



Navigation



Expert → Diagnostics → Event logbook → Filter options

Description

Use this function to select the category whose event messages are displayed in the event list of the operating tool.

Selection

- All
- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- Information (I)

Factory setting All

Additional information *Description*

- i** The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:
- F = Failure
 - C = Function Check
 - S = Out of Specification
 - M = Maintenance Required

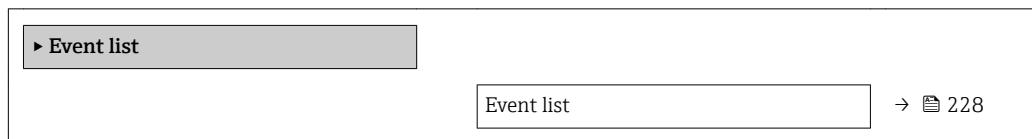
"Event list" submenu

i The **Event list** submenu is only displayed if operating via the local display.

If operating via the FieldCare operating tool, the event list can be read out with a separate FieldCare module.

If operating via the Web browser, the event messages can be found directly in the **Event logbook** submenu.

Navigation  Expert → Diagnostics → Event logbook → Event list



Event list

Navigation

 Expert → Diagnostics → Event logbook → Event list

Description

Displays the history of event messages of the category selected in the **Filter options** parameter (→  227).

User interface

- For a "Category I" event message
Information event, short message, symbol for event recording and operating time when error occurred
- For a "Category F, C, S, M" event message (status signal)
Diagnostics code, short message, symbol for event recording and operating time when error occurred

Additional information

Description

A maximum of 20 event messages are displayed in chronological order.

If the **Extended HistoROM** application package (order option) is enabled in the device, the event list can contain up to 100 entries.

The following symbols indicate whether an event has occurred or has ended:

- ⊖: Occurrence of the event
- ⊕: End of the event

Examples

For the display format:

- I1091 Configuration modified
⊖ 24d12h13m00s
- F271 Main electronics
⊖ 01d04h12min30s

HistoROM

A HistoROM is a "non-volatile" device memory in the form of an EEPROM.

3.12.3 "Device info" submenu

Navigation

Expert → Diagnostics → Device info

| ► Device info | |
|-------------------------|-------|
| Device tag (0011) | → 229 |
| Serial number (0009) | → 230 |
| Firmware version (0010) | → 230 |
| Device name (0020) | → 231 |
| Order code (0008) | → 231 |
| Ext. order cd. 1 (0023) | → 231 |
| Ext. order cd. 2 (0021) | → 232 |
| Ext. order cd. 3 (0022) | → 232 |
| ENP version (0012) | → 232 |

Device tag

Navigation

Expert → Diagnostics → Device info → Device tag (0011)

Description

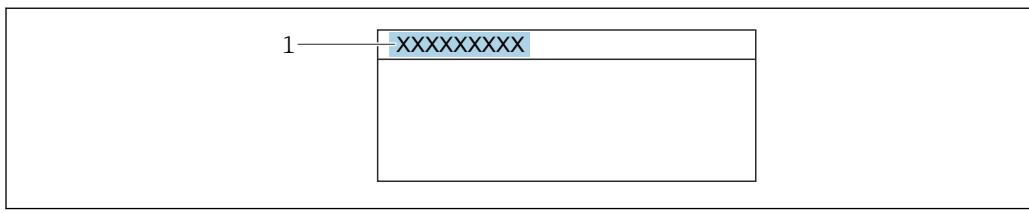
Displays a unique name for the measuring point so it can be identified quickly within the plant. The name is displayed in the header.

User interface

Max. 32 characters, such as letters, numbers or special characters (e.g. @, %, /).

Factory setting Cubemass 300 PA

Additional information *Display*



A0029422

1 Position of the header text on the display

The number of characters displayed depends on the characters used.

Serial number

Navigation Expert → Diagnostics → Device info → Serial number (0009)

Description Displays the serial number of the measuring device.

The number can be found on the nameplate of the sensor and transmitter.

User interface Max. 11-digit character string comprising letters and numbers.

Additional information *Description*

Uses of the serial number

- To identify the measuring device quickly, e.g. when contacting Endress+Hauser.
- To obtain specific information on the measuring device using the Device Viewer:
www.endress.com/deviceviewer

Firmware version

Navigation Expert → Diagnostics → Device info → Firmware version (0010)

Description Displays the device firmware version installed.

User interface Character string in the format xx.yy.zz

Additional information *Display*

The Firmware version is also located:

- On the title page of the Operating instructions
- On the transmitter nameplate

Device name

Navigation  Expert → Diagnostics → Device info → Device name (0020)

Description Displays the name of the transmitter. It can also be found on the nameplate of the transmitter.

User interface Cubemass 300/500

Order code

Navigation  Expert → Diagnostics → Device info → Order code (0008)

Description Displays the device order code.

User interface Character string composed of letters, numbers and certain punctuation marks (e.g. /).

Additional information *Description*

 The order code can be found on the nameplate of the sensor and transmitter in the "Order code" field.

The order code is generated from the extended order code through a process of reversible transformation. The extended order code indicates the attributes for all the device features in the product structure. The device features are not directly readable from the order code.

 **Uses of the order code**

- To order an identical spare device.
- To identify the device quickly and easily, e.g. when contacting Endress+Hauser.

Ext. order cd. 1

Navigation  Expert → Diagnostics → Device info → Ext. order cd. 1 (0023)

Description Displays the first part of the extended order code.

On account of length restrictions, the extended order code is split into a maximum of 3 parameters.

User interface Character string

Additional information *Description*

The extended order code indicates the version of all the features of the product structure for the measuring device and thus uniquely identifies the measuring device.

 The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.

Ext. order cd. 2**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 (→ 231)

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 (→ 231)

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

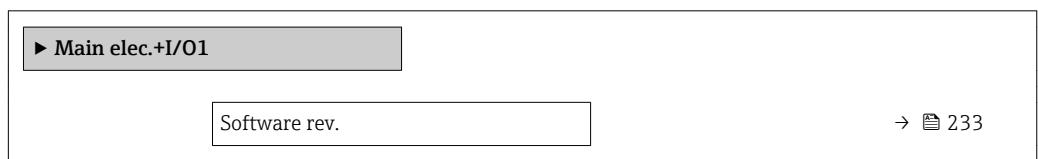
Additional information**Description**

This electronic nameplate stores a data record for device identification that includes more data than the nameplates attached to the outside of the device.

3.12.4 "Main elec.+I/O1" submenu

Navigation

Expert → Diagnostics → Main elec.+I/O1



| | |
|------------------|--------|
| Build no. softw. | → 233 |
| Bootloader rev. | → 233 |

Software rev.

Navigation Expert → Diagnostics → Main elec.+I/O1 → Software rev. (0072)

Description Use this function to display the software revision of the module.

User interface Positive integer

Build no. softw.

Navigation Expert → Diagnostics → Main elec.+I/O1 → Build no. softw. (0079)

Description Use this function to display the software build number of the module.

User interface Positive integer

Bootloader rev.

Navigation Expert → Diagnostics → Main elec.+I/O1 → Bootloader rev. (0073)

Description Use this function to display the bootloader revision of the software.

User interface Positive integer

3.12.5 "Sens. electronic" submenu

Navigation Expert → Diagnostics → Sens. electronic

| | |
|-------------------------|--------|
| Sens. electronic | |
| Software rev. (0072) | → 234 |
| Build no. softw. (0079) | → 234 |
| Bootloader rev. (0073) | → 234 |

Software rev.

Navigation   Expert → Diagnostics → Sens. electronic → Software rev. (0072)

Description Use this function to display the software revision of the module.

User interface Positive integer

Build no. softw.

Navigation   Expert → Diagnostics → Sens. electronic → Build no. softw. (0079)

Description Use this function to display the software build number of the module.

User interface Positive integer

Bootloader rev.

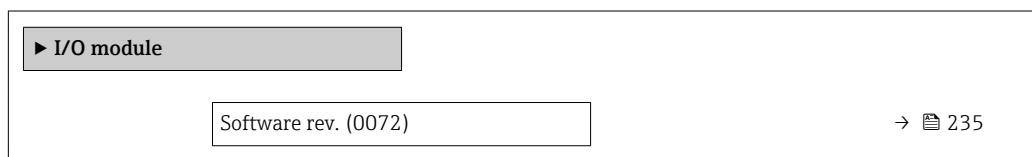
Navigation   Expert → Diagnostics → Sens. electronic → Bootloader rev. (0073)

Description Use this function to display the bootloader revision of the software.

User interface Positive integer

3.12.6 "I/O module 1" submenu

Navigation   Expert → Diagnostics → I/O module 1



I/O 1 terminals

Navigation   Expert → Diagnostics → I/O module 1 → I/O 1 terminals (3902-1)

Description Displays the terminal numbers used by the I/O module.

- User interface**
- Not used
 - 26-27 (I/O 1)
 - 24-25 (I/O 2)

Software rev.

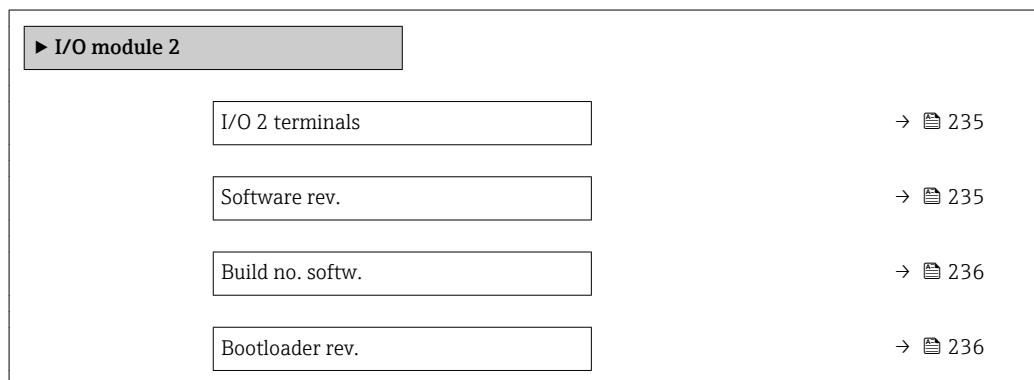
Navigation  Expert → Diagnostics → I/O module → Software rev. (0072)

Description Use this function to display the software revision of the module.

User interface Positive integer

3.12.7 "I/O module 2" submenu

Navigation  Expert → Diagnostics → I/O module 2



I/O 2 terminals

Navigation  Expert → Diagnostics → I/O module 2 → I/O 2 terminals (3902)

Description Displays the terminal numbers used by the I/O module.

- User interface**
- Not used
 - 26-27 (I/O 1)
 - 24-25 (I/O 2)

Software rev.

Navigation  Expert → Diagnostics → I/O module → Software rev. (0072)

Description Use this function to display the software revision of the module.

User interface Positive integer

Build no. softw.

Navigation  Expert → Diagnostics → I/O module 2 → Build no. softw. (0079)

Description Use this function to display the software build number of the module.

User interface Positive integer

Bootloader rev.

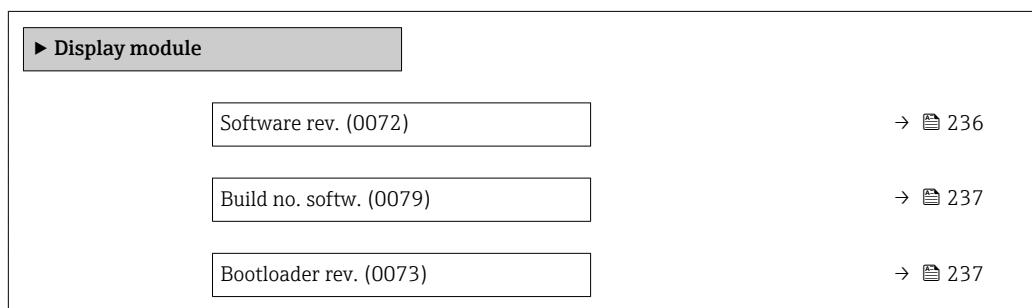
Navigation  Expert → Diagnostics → I/O module 2 → Bootloader rev. (0073)

Description Use this function to display the bootloader revision of the software.

User interface Positive integer

3.12.8 "Display module" submenu

Navigation  Expert → Diagnostics → Display module



Software rev.

Navigation  Expert → Diagnostics → Display module → Software rev. (0072)

Description Use this function to display the software revision of the module.

User interface Positive integer

Build no. softw.

| | |
|-----------------------|---|
| Navigation |   Expert → Diagnostics → Display module → Build no. softw. (0079) |
| Description | Use this function to display the software build number of the module. |
| User interface | Positive integer |

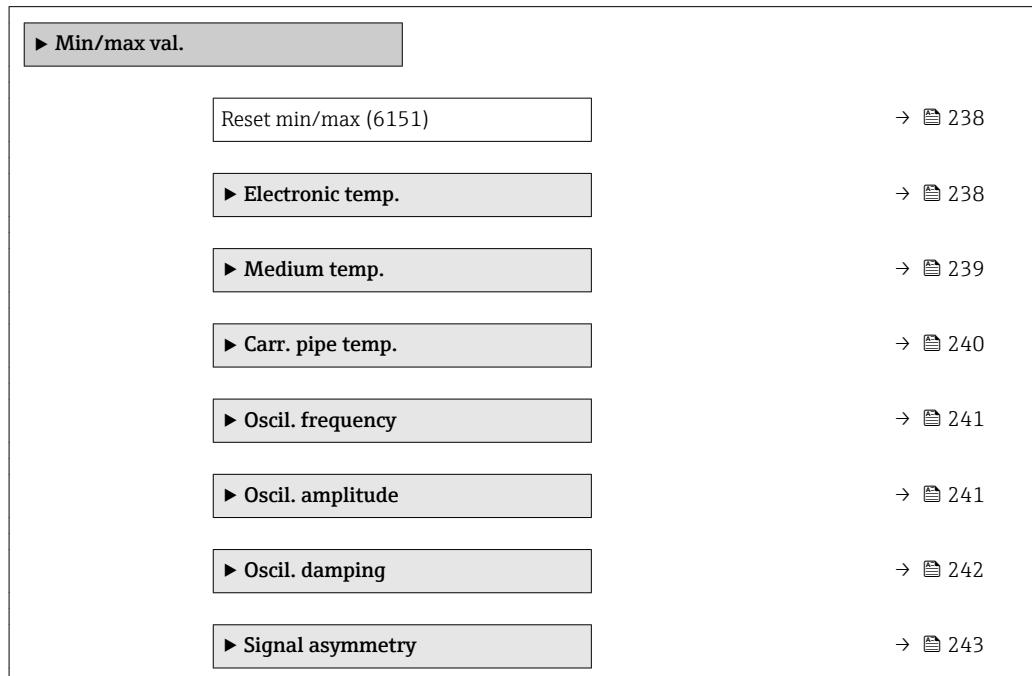
Bootloader rev.

| | |
|-----------------------|--|
| Navigation |   Expert → Diagnostics → Display module → Bootloader rev. (0073) |
| Description | Use this function to display the bootloader revision of the software. |
| User interface | Positive integer |

3.12.9 "Min/max val." submenu

Navigation

  Expert → Diagnostics → Min/max val.



| | |
|----------------------|---|
| ▶ Min/max val. | |
| Reset min/max (6151) | →  238 |
| ▶ Electronic temp. | →  238 |
| ▶ Medium temp. | →  239 |
| ▶ Carr. pipe temp. | →  240 |
| ▶ Oscil. frequency | →  241 |
| ▶ Oscil. amplitude | →  241 |
| ▶ Oscil. damping | →  242 |
| ▶ Signal asymmetry | →  243 |

Reset min/max**Navigation**

Expert → Diagnostics → Min/max val. → Reset min/max (6151)

Description

Use this function to select measured variables whose minimum, maximum and average measured values are to be reset.

Selection

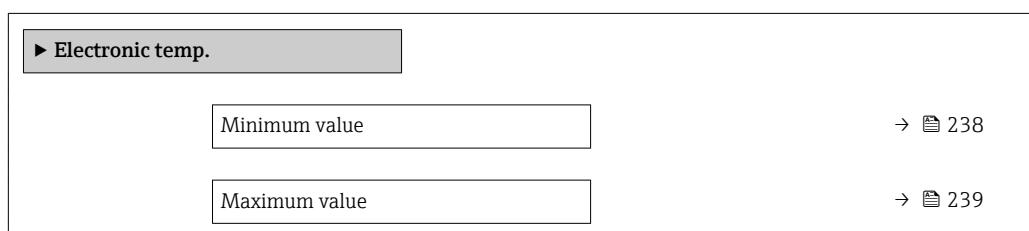
- Cancel
- Oscil. amplitude *
- Oscil. damping
- Oscil. frequency
- Signal asymmetry

Factory setting

Cancel

"Electronic temp." submenu**Navigation**

Expert → Diagnostics → Min/max val. → Electronic temp.

**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**Dependency**

The unit is taken from the **Temperature unit** parameter (→ [64](#))

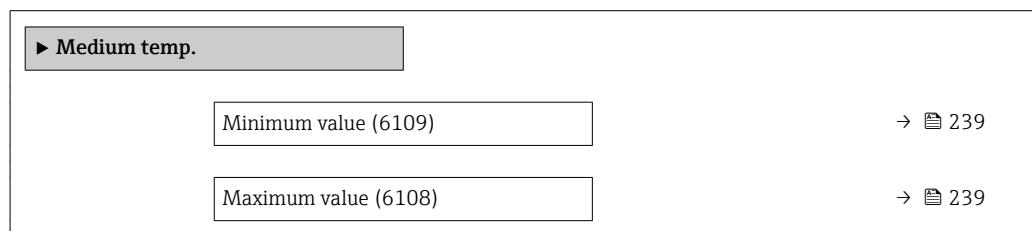
* Visibility depends on order options or device settings

Maximum value

| | |
|-------------------------------|---|
| Navigation | Diagram 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 | <p><i>Dependency</i></p>  The unit is taken from the Temperature unit parameter (→ 64) |

"Medium temp." submenu

Navigation Diagram Expert → Diagnostics → Min/max val. → Medium temp.



Minimum value

| | |
|-------------------------------|---|
| Navigation | Diagram 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 | <p><i>Dependency</i></p>  The unit is taken from the Temperature unit parameter (→ 64) |

Maximum value

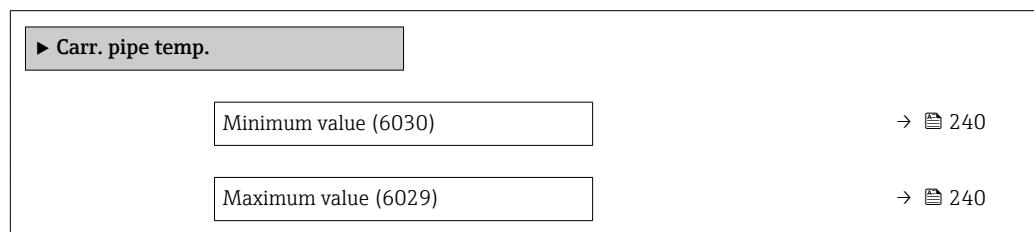
| | |
|-----------------------|---|
| Navigation | Diagram Expert → Diagnostics → Min/max val. → Medium temp. → Maximum value (6108) |
| Description | Displays the highest previously measured medium temperature value. |
| User interface | Signed floating-point number |

Additional information*Dependency*

The unit is taken from the **Temperature unit** parameter (→ [64](#))

"Carr. pipe temp." submenu**Navigation**

Expert → Diagnostics → Min/max val. → Carr. pipe temp.



Minimum value

Navigation

Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Minimum value (6030)

Prerequisite

For the following order code
"Application package", option **EB** "Heartbeat Verification + Monitoring"

Description

Displays the lowest previously measured temperature value of the carrier pipe.

User interface

Signed floating-point number

Additional information*Dependency*

The unit is taken from the **Temperature unit** parameter (→ [64](#))

Maximum value

Navigation

Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Maximum value (6029)

Prerequisite

For the following order code
"Application package", option **EB** "Heartbeat Verification + Monitoring"

Description

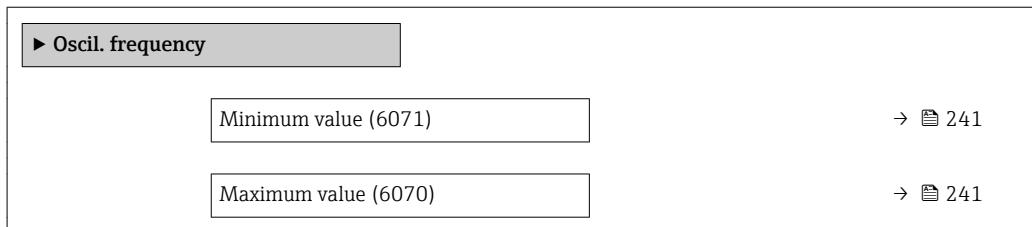
Displays the highest previously measured temperature value of the carrier pipe.

User interface

Signed floating-point number

Additional information*Dependency*

The unit is taken from the **Temperature unit** parameter (→ [64](#))

"Oscil. frequency" submenu**Navigation** Expert → Diagnostics → Min/max val. → Oscil. frequency

Minimum value

Navigation Expert → Diagnostics → Min/max val. → Oscil. frequency → Minimum value (6071)**Description**

Displays the lowest previously measured oscillation frequency.

User interface

Signed floating-point number

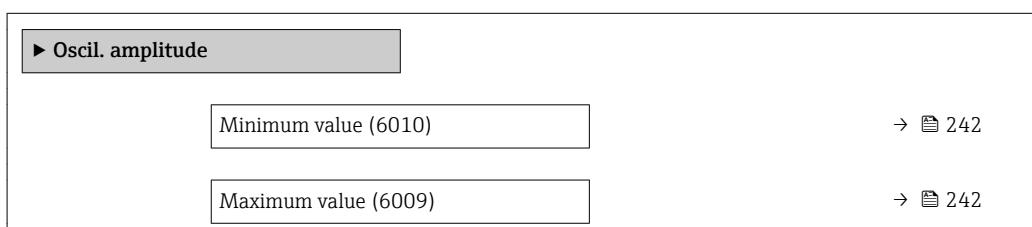
Maximum value

Navigation Expert → Diagnostics → Min/max val. → Oscil. frequency → Maximum value (6070)**Description**

Displays the highest previously measured oscillation frequency.

User interface

Signed floating-point number

"Oscil. amplitude" submenu**Navigation** Expert → Diagnostics → Min/max val. → Oscil. amplitude

Minimum value

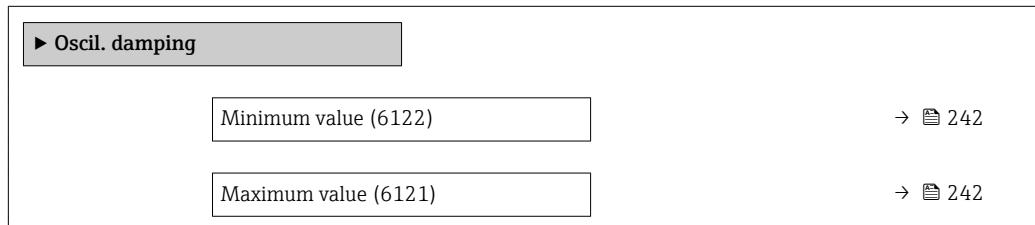
| | |
|-----------------------|---|
| Navigation |   Expert → Diagnostics → Min/max val. → Oscil. amplitude → Minimum value (6010) |
| Description | Displays the lowest previously measured oscillation amplitude. |
| User interface | Signed floating-point number |

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 |

"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 |

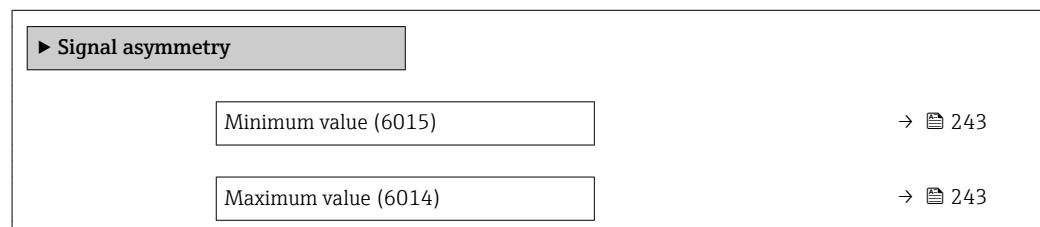
Maximum value

| | |
|--------------------|---|
| 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

"Signal asymmetry" submenu

Navigation Expert → Diagnostics → Min/max val. → Signal asymmetry



Minimum value

Navigation Expert → Diagnostics → Min/max val. → Signal asymmetry → Minimum value (6015)

Description Displays the lowest previously measured signal asymmetry.

User interface Signed floating-point number

Maximum value

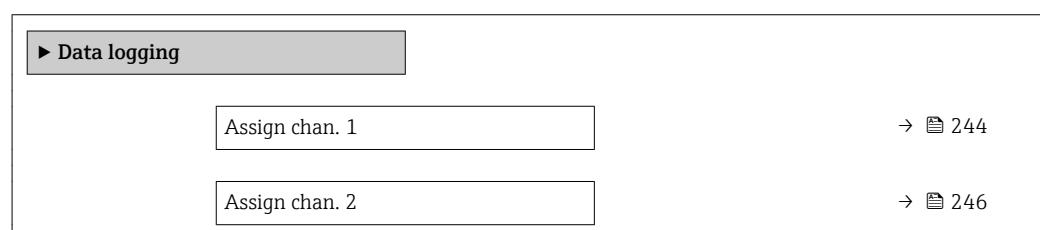
Navigation Expert → Diagnostics → Min/max val. → Signal asymmetry → Maximum value (6014)

Description Displays the highest previously measured signal asymmetry.

User interface Signed floating-point number

3.12.10 "Data logging" submenu

Navigation Expert → Diagnostics → Data logging



| | |
|-------------------|--------|
| Assign chan. 3 | → 246 |
| Assign chan. 4 | → 246 |
| Logging interval | → 247 |
| Clear logging | → 247 |
| Data logging | → 248 |
| Logging delay | → 248 |
| Data log.control | → 248 |
| Data log. status | → 249 |
| Logging duration | → 249 |
| ► Displ.channel 1 | → 250 |
| ► Displ.channel 2 | → 251 |
| ► Displ.channel 3 | → 251 |
| ► Displ.channel 4 | → 252 |

Assign chan. 1



Navigation

Expert → Diagnostics → Data logging → Assign chan. 1 (0851)

Prerequisite

The **Extended HistoROM** application package is available.

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 44).

Description

Use this function to select a process variable for the data logging channel.

Selection

- Off
- Mass flow
- Volume flow
- Correct.vol.flow *
- Target mass flow *
- Carrier mass fl. *
- Target vol. flow *
- Carrier vol. fl. *
- Targ.corr.vol.fl *
- Carr.corr.vol.fl *

* Visibility depends on order options or device settings

- Density
- Ref.density *
- Ref.dens.altern. *
- GSV flow *
- GSVA *
- NSV flow *
- NSVA *
- S&W volume flow *
- Water cut *
- Oil density *
- Water density *
- Oil mass flow
- Water mass flow *
- Oil volume flow *
- Water vol. flow *
- Oil corr.vol.fl. *
- Water corr.v.fl. *
- Concentration *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Freq. fluct. 0 *
- Oscil. amplitude *
- Freq. fluct. 0 *
- Osc. damping 0 *
- Osc.damp.fluct 0 *
- Signal asymmetry *
- Exc. current 0 *
- HBSI *
- Curr.output 1 *
- Pressure

Factory setting Off

Additional information *Description*

A total of 1000 measured values can be logged. This means:

- 1000 data points if 1 logging channel is used
- 500 data points if 2 logging channels are used
- 333 data points if 3 logging channels are used
- 250 data points if 4 logging channels are used

Once the maximum number of data points is reached, the oldest data points in the data log are cyclically overwritten in such a way that the last 1000, 500, 333 or 250 measured values are always in the log (ring memory principle).

 The log contents are cleared if the option selected is changed.

Selection

 Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry**: Assign freq. parameter (→  119)

* Visibility depends on order options or device settings

Assign chan. 2



| | |
|------------------------|--|
| 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 (→ 44). |
| Description | Options for the assignment of a process variable to the data logging channel. |
| Selection | Picklist, see Assign channel 1 parameter (→ 244) |
| 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 (→ 44). |
| Description | Options for the assignment of a process variable to the data logging channel. |
| Selection | Picklist, see Assign channel 1 parameter (→ 244) |
| 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 (→ 44). |
| Description | Options for the assignment of a process variable to the data logging channel. |
| Selection | Picklist, see Assign channel 1 parameter (→ 244) |
| 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 (→ 44).

Description Use this function to enter the logging interval T_{\log} for data logging.

User entry 0.1 to 3 600.0 s

Factory setting 1.0 s

Additional information *Description*

This defines the interval between the individual data points in the data log, and thus the maximum loggable process time T_{\log} :

- If 1 logging channel is used: $T_{\log} = 1000 \times t_{\log}$
- If 2 logging channels are used: $T_{\log} = 500 \times t_{\log}$
- If 3 logging channels are used: $T_{\log} = 333 \times t_{\log}$
- If 4 logging channels are used: $T_{\log} = 250 \times t_{\log}$

Once this time elapses, the oldest data points in the data log are cyclically overwritten such that a time of T_{\log} always remains in the memory (ring memory principle).

The log contents are cleared if the length of the logging interval is changed.

Example

If 1 logging channel is used:

- $T_{\log} = 1000 \times 1 \text{ s} = 1 000 \text{ s} \approx 15 \text{ min}$
- $T_{\log} = 1000 \times 10 \text{ s} = 10 000 \text{ s} \approx 3 \text{ h}$
- $T_{\log} = 1000 \times 80 \text{ s} = 80 000 \text{ s} \approx 1 \text{ d}$
- $T_{\log} = 1000 \times 3 600 \text{ s} = 3 600 000 \text{ s} \approx 41 \text{ d}$

Clear logging

Navigation Expert → Diagnostics → Data logging → Clear logging (0855)

Prerequisite The **Extended HistoROM** application package is available.

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 44).

Description Use this function to clear the entire logging data.

Selection

- Cancel
- Clear data

Factory setting Cancel

Additional information*Selection*

- Cancel
The data is not cleared. All the data is retained.
- Clear data
The logging data is cleared. The logging process starts from the beginning.

Data logging**Navigation**

Expert → Diagnostics → Data logging → Data logging (0860)

Description

Use this function to select the data logging method.

Selection

- Overwriting
- Not overwriting

Factory setting

Overwriting

Additional information*Selection*

- Overwriting
The device memory applies the FIFO principle.
- Not overwriting
Data logging is canceled if the measured value memory is full (single shot).

Logging delay**Navigation**

Expert → Diagnostics → Data logging → Logging delay (0859)

Prerequisite

In the **Data logging** parameter (→ 248), 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 (→ 248), 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 (→ 248), the **Not overwriting** option is selected.

| | |
|-------------------------------|---|
| Description | Use this function to start and stop measured value logging. |
| Selection | <ul style="list-style-type: none"> ▪ None ▪ Delete + start ▪ Stop |
| Factory setting | None |
| Additional information | <p><i>Selection</i></p> <ul style="list-style-type: none"> ▪ 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 (→ 248), 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

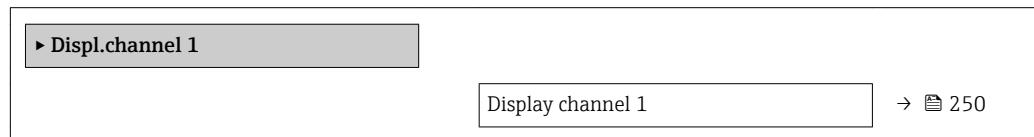
| | |
|---------------------|---|
| Navigation |  Expert → Diagnostics → Data logging → Logging duration (0861) |
| Prerequisite | In the Data logging parameter (→ 248), the Not overwriting option is selected. |
| Description | Displays the total logging duration. |

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 (→  44).

One of the following options is selected in the **Assign chan. 1** parameter (→  244):

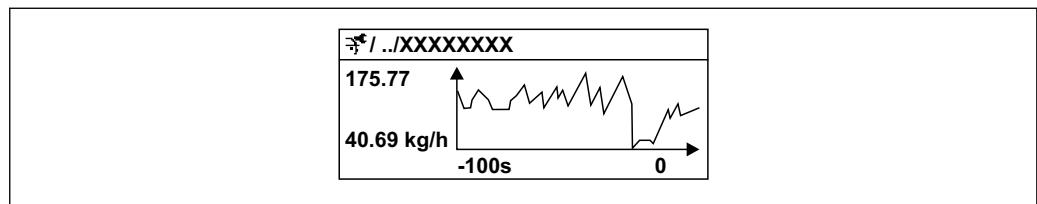
- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl.*
- Density
- Ref.density
- Concentration *
- Carr. pipe temp. *
- Electronic temp.
- Curr.output 1
- Osc. freq. 0
- Freq. fluct. 0
- Oscil. amplitude *
- Osc. damping 0
- Osc.damp.fluct 0
- Signal asymmetry
- Exc. current 0

Description Displays the measured value trend for the logging channel in the form of a chart.

* Visibility depends on order options or device settings

Additional information*Prerequisite*

 Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry**: Assign freq. parameter (→ [119](#))

Description

 9 Chart of a measured value trend

- x-axis: depending on the number of channels selected displays 250 to 1000 measured values of a process variable.
- y-axis: displays the approximate measured value span and constantly adapts this to the ongoing measurement.

"Displ.channel 2" submenu*Navigation*

 Expert → Diagnostics → Data logging → Displ.channel 2

**Display channel 2***Navigation*

 Expert → Diagnostics → Data logging → Displ.channel 2

Prerequisite

A process variable is defined in the **Assign chan. 2** parameter.

Description

See the **Display channel 1** parameter → [250](#)

"Displ.channel 3" submenu*Navigation*

 Expert → Diagnostics → Data logging → Displ.channel 3



Display channel 3

| | |
|--------------|---|
| Navigation | ④ 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 → ④ 250 |

"Displ.channel 4" submenu

Navigation ④ Expert → Diagnostics → Data logging → Displ.channel 4



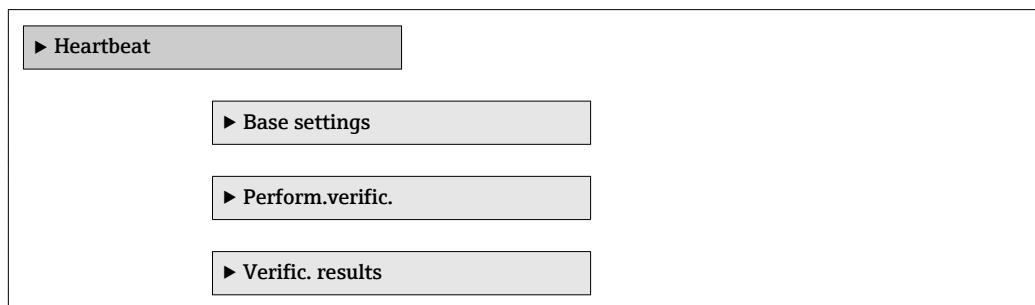
Display channel 4

| | |
|--------------|---|
| Navigation | ④ 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 → ④ 250 |

3.12.11 "Heartbeat" submenu

④ For detailed information on the parameter descriptions for the **Heartbeat Verification+Monitoring** application package, refer to the Special Documentation for the device → ④ 7

Navigation ④ ④ Expert → Diagnostics → Heartbeat



► HBT Monitoring

► Monitor. results

3.12.12 "Simulation" submenu

Navigation

Diagram Expert → Diagnostics → Simulation

► Simulation

Assign proc.var. (1810)

→ 254

Proc. var. value (1811)

→ 254

Status inp. sim. (1355)

→ 255

Signal level (1356)

→ 255

Curr.inp 1 to n sim. (1608-1 to n)

→ 256

Value curr.inp 1 to n (1609-1 to n)

→ 256

Curr.out. 1 to n sim. (0354-1 to n)

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→ 262

Assign proc.var.**Navigation**

Expert → Diagnostics → Simulation → Assign proc.var. (1810)

Description

Use this function to select a process variable for the simulation process that is activated. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- Mass flow
- Volume flow
- Correct.vol.flow *
- Target vol. flow *
- Carrier vol. fl. *
- Targ.corr.vol.fl *
- Carr.corr.vol.fl *
- Density *
- Ref.density *
- Ref.dens.altern. *
- GSV flow *
- GSVA *
- NSV flow *
- NSVa *
- S&W volume flow *
- Water cut *
- Oil density *
- Water density *
- Oil mass flow
- Water mass flow *
- Oil volume flow *
- Water vol. flow *
- Oil corr.vol.fl. *
- Water corr.v.fl. *
- Density average *
- Temp. average
- Temperature
- Concentration *
- Target mass flow *
- Carrier mass fl.

Factory setting

Off

Additional information*Description*

The simulation value of the process variable selected is defined in the **Proc. var. value** parameter (→ 254).

Proc. var. value**Navigation**

Expert → Diagnostics → Simulation → Proc. var. value (1811)

Prerequisite

A process variable is selected in the **Assign proc.var.** parameter (→ 254).

* Visibility depends on order options or device settings

| | |
|-------------------------------|--|
| 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 | <p><i>User entry</i></p> <p> The unit of the displayed measured value is taken from the System units submenu (→ 58).</p> |

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 | <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 Signal level parameter (→ 255).</p> <p><i>Selection</i></p> <ul style="list-style-type: none"> ▪ 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 (→ 255), 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 | <ul style="list-style-type: none"> ▪ 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*Selection*

- Off
Current simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
Current simulation is active.

Value curr.inp 1 to n**Navigation**

Expert → Diagnostics → Simulation → Value curr.inp 1 to n (1609–1 to n)

Prerequisite

In the **Curr.inp 1 to n sim.** parameter, the **On** option is selected.

Description

Use this function to enter the current value for the simulation. In this way, users can verify the correct configuration of the current input and the correct function of upstream feed-in units.

User entry

0 to 22.5 mA

Curr.out. 1 to n sim.**Navigation**

Expert → Diagnostics → Simulation → Curr.out. 1 to n sim. (0354–1 to n)

Description

Use this function to switch simulation of the current output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting

Off

Additional information*Description*

The desired simulation value is defined in the **Value curr.out 1 to n** parameter.

Selection

■ Off

Current simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.

■ On

Current simulation is active.

Value curr.out 1 to n**Navigation**

Expert → Diagnostics → Simulation → Value curr.out 1 to n (0355-1 to n)

Prerequisite

In the **Curr.out. 1 to n sim.** parameter, the **On** option is selected.

Description

Use this function to enter a current value for the simulation. In this way, users can verify the correct adjustment of the current output and the correct function of downstream switching units.

User entry

3.59 to 22.5 mA

Additional information*Dependency*

The input range is dependent on the option selected in the **Current span** parameter (→ 100).

FreqOutputSim 1 to n**Navigation**

Expert → Diagnostics → Simulation → FreqOutputSim 1 to n (0472-1 to n)

Prerequisite

In the **Operating mode** parameter (→ 114), the **Frequency** option is selected.

Description

Use this function to switch simulation of the frequency output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting

Off

Additional information*Description*

The desired simulation value is defined in the **Freq value 1 to n** parameter.

Selection

- Off

Frequency simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.

- On

Frequency simulation is active.

Freq value 1 to n**Navigation**

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 (→ 114), the **Pulse** option is selected.

Description

Use this function to switch simulation of the pulse output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- Fixed value
- Down-count. val.

Factory setting

Off

Additional information*Description*

The desired simulation value is defined in the **Pulse value 1 to n** parameter.

Selection

- Off

Pulse simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.

- Fixed value

Pulses are continuously output with the pulse width specified in the **Pulse width** parameter (→ 117).

- Down-count. val.

The pulses specified in the **Pulse value** parameter (→ 259) are output.

Pulse value 1 to n**Navigation**

Expert → Diagnostics → Simulation → Pulse value 1 to n (0459-1 to n)

Prerequisite

In the **Puls.outp.sim. 1 to n** parameter, the **Down-count. val.** option is selected.

Description

Use this function to enter a pulse value for the simulation. In this way, users can verify the correct adjustment of the pulse output and the correct function of downstream switching units.

User entry

0 to 65 535

Switch sim. 1 to n**Navigation**

Expert → Diagnostics → Simulation → Switch sim. 1 to n (0462-1 to n)

Prerequisite

In the **Operating mode** parameter (→ 114), the **Switch** option is selected.

Description

Use this function to switch simulation of the switch output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting

Off

Additional information*Description*

The desired simulation value is defined in the **Switch status 1 to n** parameter.

Selection

- Off

Switch simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.

- On

Switch simulation is active.

Switch status 1 to n**Navigation**

Expert → Diagnostics → Simulation → Switch status 1 to n (0463–1 to n)

Description

Use this function to select a switch value for the simulation. In this way, users can verify the correct adjustment of the switch output and the correct function of downstream switching units.

Selection

- Open
- Closed

Additional information*Selection*

- Open

Switch simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.

- Closed

Switch simulation is active.

Relay out. 1 to n sim**Navigation**

Expert → Diagnostics → Simulation → Relay out. 1 to n sim (0802–1 to n)

Description

Use this function to switch simulation of the relay output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting

Off

Additional information*Description*

The desired simulation value is defined in the **Switch status 1 to n** parameter.

Selection

- Off

Relay simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.

- On

Relay simulation is active.

Switch status 1 to n**Navigation**

Expert → Diagnostics → Simulation → Switch status 1 to n (0803-1 to n)

Prerequisite

The **On** option is selected in the **Switch sim. 1 to n** parameter parameter.

Description

Use this function to select a relay value for the simulation. In this way, users can verify the correct adjustment of the relay output and the correct function of downstream switching units.

Selection

- Open
- Closed

Additional information*Selection*

- Open

Relay simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.

- Closed

Relay simulation is active.

Dev. alarm sim.**Navigation**

Expert → Diagnostics → Simulation → Dev. alarm sim. (0654)

Description

Use this function to switch the device alarm on and off.

Selection

- Off
- On

Factory setting

Off

Additional information*Description*

The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Event category

Navigation Expert → Diagnostics → Simulation → Event category (0738)

Description Use this function to select the category of the diagnostic events that are displayed for the simulation in the **Diag. event sim.** parameter (→ 262).

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 (→ 262).

4 Country-specific factory settings

4.1 SI units

 Not valid for USA and Canada.

4.1.1 System units

| | |
|-----------------------|-------|
| Mass | kg |
| Mass flow | kg/h |
| Volume | 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

 The factory settings apply to the following parameters:

- 20 mA value (full scale value of the current output)
- 100% bar graph value 1

| Nominal diameter [mm] | [kg/h] |
|--------------------------|--------|
| 1 | 4 |
| 2 | 20 |
| 4 | 90 |
| 6 | 200 |

4.1.3 Output current span

| | |
|-----------------------|------------------|
| Current output 1 to n | 4 to 20 mA NAMUR |
|-----------------------|------------------|

4.1.4 Pulse value

| Nominal diameter [mm] | [kg/p] |
|--------------------------|--------|
| 1 | 0.001 |
| 2 | 0.01 |
| 4 | 0.01 |
| 6 | 0.1 |

4.1.5 On value low flow cut off

i The switch-on point depends on the type of medium and the nominal diameter.

| Nominal diameter [mm] | On-value for liquid [kg/h] |
|-----------------------|----------------------------|
| 1 | 0.08 |
| 2 | 0.4 |
| 4 | 1.8 |
| 6 | 4 |

| Nominal diameter [mm] | Switch-on value for gas [kg/h] |
|-----------------------|--------------------------------|
| 1 | 0.02 |
| 2 | 0.1 |
| 4 | 0.45 |
| 6 | 1 |

4.2 US units

i 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

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 [in] | [lb/min] |
|-----------------------|----------|
| 1/24 | 0.15 |
| 1/12 | 0.75 |
| 1/8 | 3.3 |
| 1/4 | 7.4 |

4.2.3 Output current span

| | |
|-----------------------|---------------|
| Current output 1 to n | 4 to 20 mA US |
|-----------------------|---------------|

4.2.4 Pulse value

| Nominal diameter [in] | [lb/p] |
|--------------------------|--------|
| 1/24 | 0.002 |
| 1/12 | 0.02 |
| 1/8 | 0.02 |
| 1/4 | 0.2 |

4.2.5 On value low flow cut off

 The switch-on point depends on the type of medium and the nominal diameter.

| Nominal diameter [in] | On-value for liquid [lb/min] |
|--------------------------|---------------------------------|
| 1/24 | 0.003 |
| 1/12 | 0.015 |
| 1/8 | 0.066 |
| 1/4 | 0.15 |

| Nominal diameter [in] | Switch-on value for gas [lb/min] |
|--------------------------|-------------------------------------|
| 1/24 | 0.001 |
| 1/12 | 0.004 |
| 1/8 | 0.016 |
| 1/4 | 0.0375 |

5 Explanation of abbreviated units

5.1 SI units

| Process variable | Units | Explanation |
|------------------|--|---|
| Density | g/cm 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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