GP01062D/06/EN/01.16
71303513
Valid as of version
01.00.zz (Device firmware)

Products   Solutions   Services

Description of Device Parameters
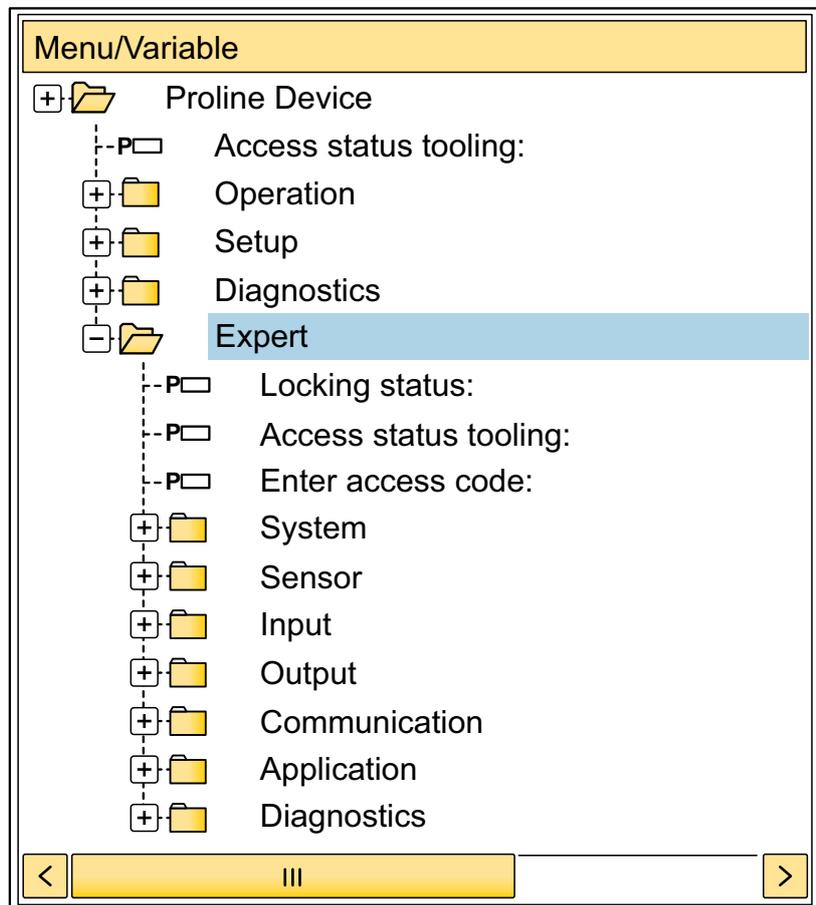## Proline Promass 500
Modbus RS485

Coriolis flowmeter

Menu/Variable
⊞ 📁 Proline Device
-P▭ Access status tooling:
⊞ 📁 Operation
⊞ 📁 Setup
⊞ 📁 Diagnostics
⊟ 📂 Expert
--P▭ Locking status:
--P▭ Access status tooling:
--P▭ Enter access code:
⊞ 📁 System
⊞ 📁 Sensor
⊞ 📁 Input
⊞ 📁 Output
⊞ 📁 Communication
⊞ 📁 Application
⊞ 📁 Diagnostics
‹   III   ›

Endress+Hauser

People for Process Automation

Table of contents

1   Document information

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 (→ 🖺 9), which is displayed when the **"Maintenance" user role** is enabled.
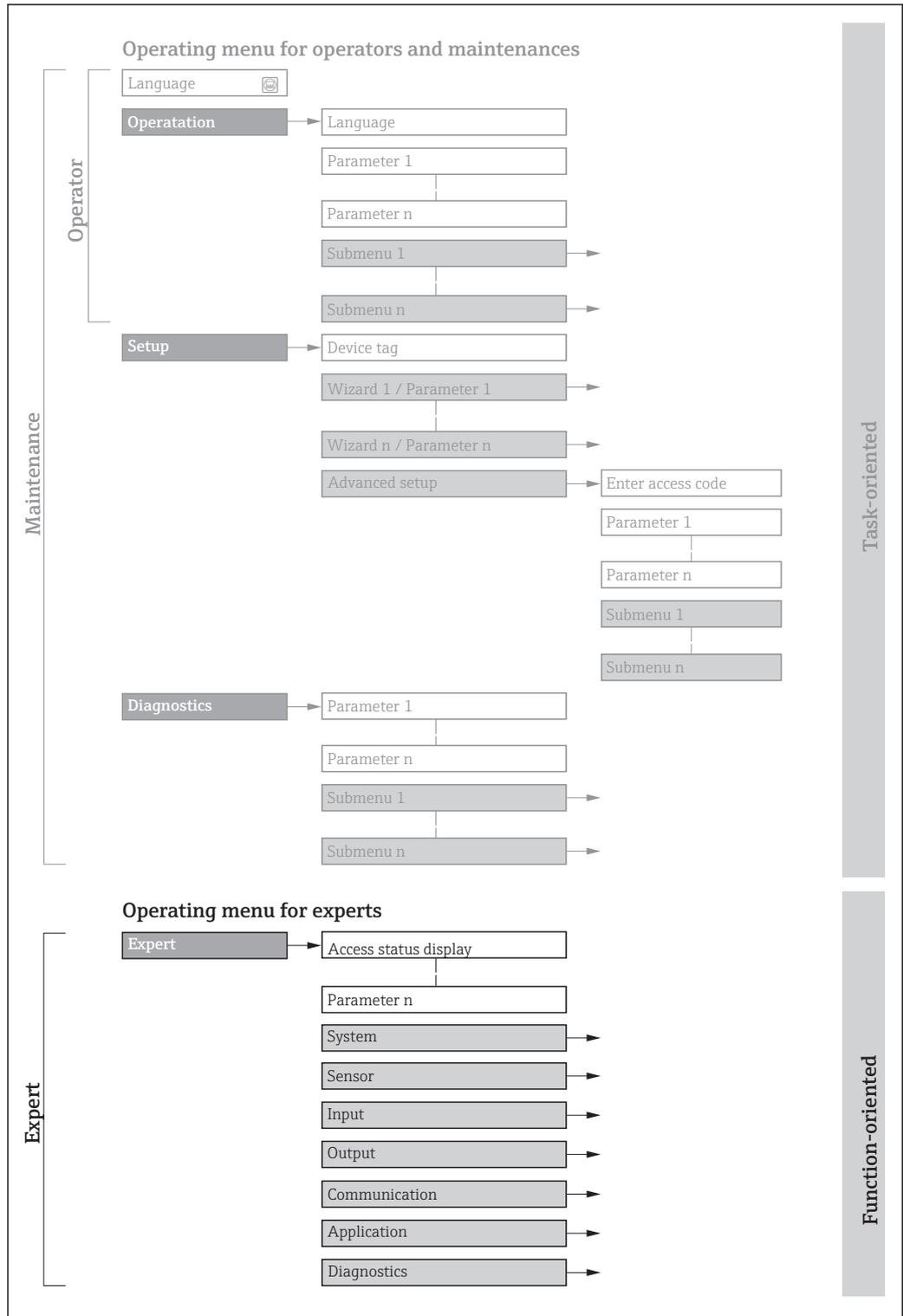
☒ 1   Sample graphic for the schematic layout of the operating menu

Detailed information concerning:
- Arrangement of the parameters according to the menu structure of the **Operation** menu, **Setup** menu, **Diagnostics** menu along with a brief description, see the Operating Instructions for the device → 🕮 8
- Operating philosophy of the operating menu: "Operating philosophy" chapter of the Operating Instructions for the device → 🕮 8

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
Promass A 500	BA01537D
Promass E 500	BA01539D
Promass F 500	BA01540D
Promass H 500	BA01541D
Promass I 500	BA01542D
Promass O 500	BA01543D
Promass P 500	BA01544D
Promass Q 500	BA01545D
Promass S 500	BA01546D
Promass X 500	BA01547D

1.5.2 Supplementary device-dependent documentation

Special documentation

Contents	Documentation code
Information on the Pressure Equipment Directive	SD01614D
Web server	SD01667D
Heartbeat Technology	SD01704D
Concentration measurement	SD01710D
Viscosity Measurement	SD01724D
Custody transfer	SD01691D

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.

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)	→ 🗏 12
Locking status (0004)	→ 🗏 13
Access status (0005)	→ 🗏 14
Enter access code (0003)	→ 🗏 14
▸ System	→ 🗏 15
▸ Sensor	→ 🗏 47
▸ I/O configuration	→ 🗏 100
▸ Input	→ 🗏 103
▸ Output	→ 🗏 108
▸ Communication	→ 🗏 160
▸ Application	→ 🗏 173
▸ Diagnostics	→ 🗏 180

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 4-digit number and the channel number, which identifies the channel of a process variable: e.g. 0914-1. In the navigation view, this appears on the right-hand side in the header of the selected parameter.
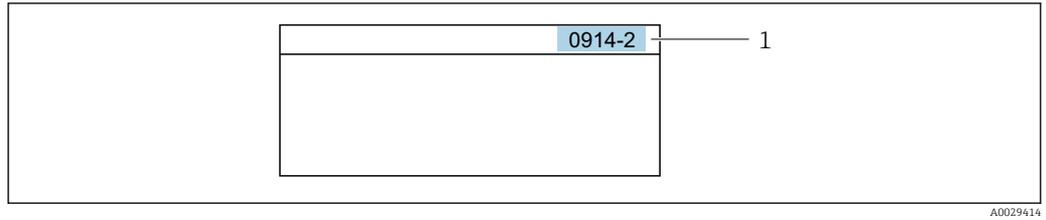
1   Direct access code

Note the following when entering the direct access code:
- The leading zeros in the direct access code do not have to be entered.
  Example: Input of **"914"** instead of **"0914"**
- If no channel number is entered, channel 1 is jumped to automatically.
  Example: Enter **0914** → **Assign process variable** parameter
- If a different channel is jumped to: Enter the direct access code with the corresponding channel number.
  Example: Enter **0914-2** → **Assign process variable** parameter

---

Locking status

Navigation	⊚🗐 Expert → Locking status (0004)
Description	Displays the active write protection.
User interface	• Hardware locked • CT active - all parameters • CT active - defined parameters • Temporarily locked
Additional information	*User interface* 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 → 🖺 8 *Selection*

Options	Description
None	The access status displayed in the **Access status** parameter (→ 🖺 14) 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).
CT active - all parameters (priority 2)	ℹ️ Only available for Promass F, O, Q and X. The DIP switch for custody transfer mode is activated on the PCB board. This locks write access to all parameters (e.g. via local display or operating tool). 📖 For detailed information on custody transfer mode, see the Special Documentation for the device → 🖺 8

Options	Description
CT active - defined parameters (priority 3)	ⓘ Only available for Promass F, O, Q and X. The DIP switch for custody transfer mode is activated on the PCB board. This locks write access to the defined parameters (e.g. via local display or operating tool). 📖 For detailed information on custody transfer mode, see the Special Documentation for the device → 🖹 8
Temporarily locked (Priority 4)	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   • Operator
                         • Maintenance

Factory setting   Maintenance

Additional information   *Description*

ⓘ Access authorization can be modified via the **Enter access code** parameter (→ 🖹 14).

ⓘ If additional write protection is active, this restricts the current access authorization even further.

User interface

📖 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 → 🖹 8

Enter 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 9999

3.1 "System" submenu

Navigation ⓘ⧉ Expert → System

```
┌──────────────────────────────────────────────────────────────┐
│  ‣ System                                                      │
│                                                                │
│         ‣ Display                               → 🗎 15         │
│                                                                │
│         ‣ Configuration backup                  → 🗎 30         │
│                                                                │
│         ‣ Diagnostic handling                   → 🗎 33         │
│                                                                │
│         ‣ Administration                        → 🗎 42         │
└──────────────────────────────────────────────────────────────┘
```

3.1.1 "Display" submenu

Navigation ⓘ⧉ Expert → System → Display

```
┌──────────────────────────────────────────────────────────────┐
│  ‣ Display                                                     │
│                                                                │
│         Display language (0104)                 → 🗎 16         │
│                                                                │
│         Format display (0098)                   → 🗎 17         │
│                                                                │
│         Value 1 display (0107)                  → 🗎 19         │
│                                                                │
│         0% bargraph value 1 (0123)              → 🗎 20         │
│                                                                │
│         100% bargraph value 1 (0125)            → 🗎 21         │
│                                                                │
│         Decimal places 1 (0095)                 → 🗎 21         │
│                                                                │
│         Value 2 display (0108)                  → 🗎 22         │
│                                                                │
│         Decimal places 2 (0117)                 → 🗎 23         │
│                                                                │
│         Value 3 display (0110)                  → 🗎 23         │
│                                                                │
│         0% bargraph value 3 (0124)              → 🗎 24         │
│                                                                │
│         100% bargraph value 3 (0126)            → 🗎 24         │
│                                                                │
│         Decimal places 3 (0118)                 → 🗎 25         │
│                                                                │
│         Value 4 display (0109)                  → 🗎 25         │
│                                                                │
│         Decimal places 4 (0119)                 → 🗎 26         │
└──────────────────────────────────────────────────────────────┘
```

Display interval (0096)	→ 🖹 26
Display damping (0094)	→ 🖹 27
Header (0097)	→ 🖹 27
Header text (0112)	→ 🖹 28
Separator (0101)	→ 🖹 29
Contrast display (0105)	→ 🖹 29
Backlight (0111)	→ 🖹 29

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 (Russian) *
                          • Svenska *
                          • Türkçe *
                          • 中文 (Chinese) *
                          • 日本語 (Japanese) *
                          • 한국어 (Korean) *
                          • Bahasa Indonesia *
                          • tiếng Việt (Vietnamese) *
                          • čeština (Czech) *

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

---

* Visibility depends on order options or device settings

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. size • 1 bargraph + 1 value • 2 values • 1 value large + 2 values • 4 values
Factory setting	1 value, max. size

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 (→ 🖺 19) to **Value 4 display** parameter (→ 🖺 25) 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 (→ 🖺 26).

Custody transfer measurement

Only available for Promass F, O, Q and X.

- Once the measuring device has been enabled for custody transfer mode, depending on the custody transfer approval selected the display can switch between showing the relevant information and the custody transfer counter.
- In addition, a padlock symbol appears in the header of the display (🔒).

For detailed information on custody transfer mode, see the Special Documentation for the device → 🖺 8

Possible measured values shown on the local display:

"1 value, max. size" option

A0013099

"1 bargraph + 1 value" option
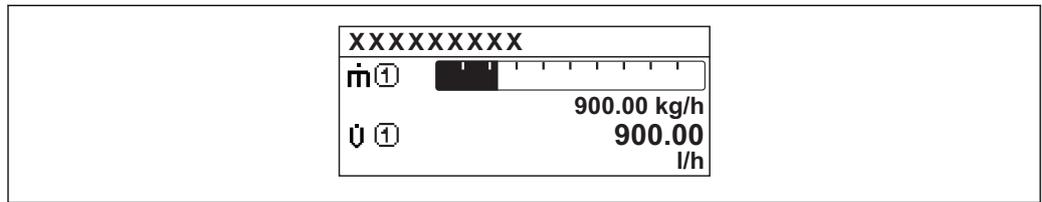
A0013098

"2 values" option
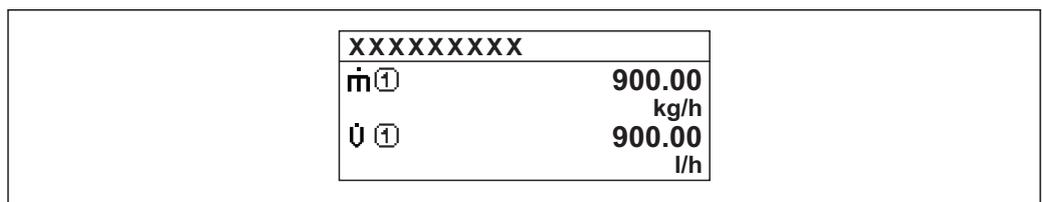
A0013100

"1 value large + 2 values" option
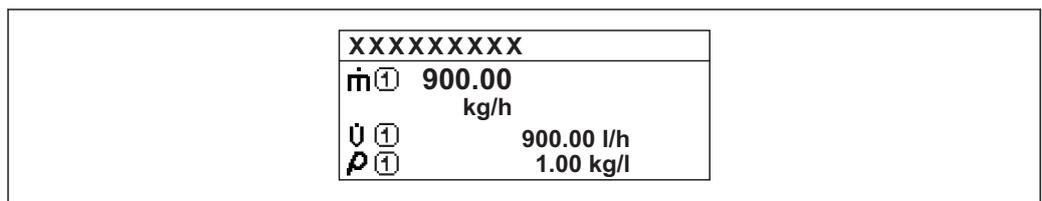
A0013102

"4 values" option
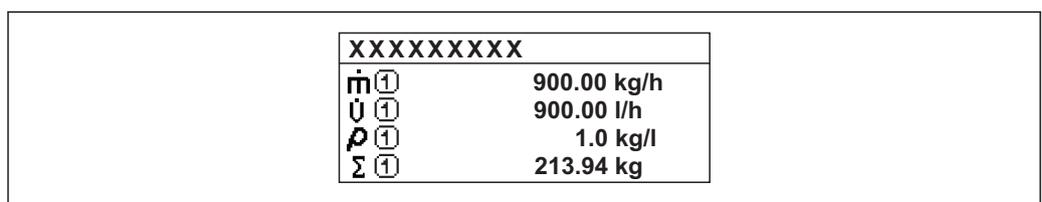
A0013103

Value 1 display	🔒

Navigation	🔲🔳 Expert → System → Display → Value 1 display (0107)

Prerequisite	A local display is provided.

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

Selection	• Mass flow
	• Volume flow
	• Corrected volume flow
	• Target mass flow *
	• Carrier mass flow *
	• Density
	• Reference density
	• Concentration *
	• Dynamic viscosity *
	• Kinematic viscosity *
	• Temp. compensated dynamic viscosity *
	• Temp. compensated kinematic viscosity *
	• Temperature
	• Carrier pipe temperature *
	• Electronic temperature
	• Oscillation frequency 0
	• Oscillation frequency 1 *
	• Oscillation amplitude 0 *
	• Oscillation amplitude 1 *
	• Frequency fluctuation 0
	• Frequency fluctuation 1 *
	• Oscillation damping 0
	• Oscillation damping 1 *
	• Oscillation damping fluctuation 0
	• Oscillation damping fluctuation 1 *
	• Signal asymmetry
	• Exciter current 0
	• Exciter current 1 *
	• HBSI *
	• Totalizer 1
	• Totalizer 2
	• Totalizer 3
	• Current output 1
	• Current output 2 *
	• Current output 3 *

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 (→ 🖺 17) is used to specify how many measured values are displayed simultaneously and how.

Custody transfer measurement

Only available for Promass F, O, Q and X.

Once the measuring device has been enabled for custody transfer mode, depending on the custody transfer approval selected the display can switch to show the relevant information.

For detailed information on custody transfer mode, see the Special Documentation for the device → 🖺 8

Dependency

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

Selection

- **Oscillation frequency** option
  Displays the current oscillation frequency of the measuring tubes. This frequency depends on the density of the medium.
- **Oscillation amplitude** option
  Displays the relative oscillation amplitude of the measuring tubes in relation to the preset value. This value is 100 % under optimum conditions.
- **Oscillation 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 value 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*
	ℹ️ The **Format display** parameter (→ 🔖 17) is used to specify that the measured value is to be displayed as a bar graph.
	User entry
	ℹ️ The unit of the displayed measured value is taken from the **System units** submenu (→ 🔖 61).

100% bargraph value 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 → 🔖 229
Additional information	*Description*
	ℹ️ The **Format display** parameter (→ 🔖 17) is used to specify that the measured value is to be displayed as a bar graph.
	User entry
	ℹ️ The unit of the displayed measured value is taken from the **System units** submenu (→ 🔖 61).

Decimal places 1 🔒

Navigation	⊞🔲 Expert → System → Display → Decimal places 1 (0095)
Prerequisite	A measured value is specified in the **Value 1 display** parameter (→ 🔖 19).
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*

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

Value 2 display	🔒

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

Prerequisite   A local display is provided.

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

Selection   • None
                      • Mass flow
                      • Volume flow
                      • Corrected volume flow
                      • Target mass flow *
                      • Carrier mass flow *
                      • Density
                      • Reference density
                      • Concentration *
                      • Dynamic viscosity *
                      • Kinematic viscosity *
                      • Temp. compensated dynamic viscosity *
                      • Temp. compensated kinematic viscosity *
                      • Temperature
                      • Carrier pipe temperature *
                      • Electronic temperature
                      • Oscillation frequency 0
                      • Oscillation frequency 1 *
                      • Oscillation amplitude 0 *
                      • Oscillation amplitude 1 *
                      • Frequency fluctuation 0
                      • Frequency fluctuation 1 *
                      • Oscillation damping 0
                      • Oscillation damping 1 *
                      • Oscillation damping fluctuation 0
                      • Oscillation damping fluctuation 1 *
                      • Signal asymmetry
                      • Exciter current 0
                      • Exciter current 1 *
                      • HBSI *
                      • Totalizer 1
                      • Totalizer 2
                      • Totalizer 3
                      • Current output 1
                      • Current output 2 *
                      • Current output 3 *
                      • Custody transfer counter *

Factory setting   None

---

*   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 second value to be displayed. The value is only displayed during normal operation.

The **Format display** parameter (→ 🖺 17) is used to specify how many measured values are displayed simultaneously and how.

Custody transfer measurement

Only available for Promass F, O, Q and X.

Once the measuring device has been enabled for custody transfer mode, depending on the custody transfer approval selected the display can switch to showing the custody transfer counter.

For detailed information on custody transfer mode, see the Special Documentation for the device → 🖺 8

Dependency

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

Decimal places 2

Navigation	🖩🖳 Expert → System → Display → Decimal places 2 (0117)
Prerequisite	A measured value is specified in the **Value 2 display** parameter (→ 🖺 22).
Description	Use this function to select the number of decimal places for measured value 2.
Selection	▪ x ▪ x.x ▪ x.xx ▪ x.xxx ▪ x.xxxx
Factory setting	x.xx
Additional information	*Description*

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

Value 3 display

Navigation	🖩🖳 Expert → System → Display → Value 3 display (0110)
Prerequisite	A local display is provided.
Description	Use this function to select one of the measured values to be shown on the local display.

Selection	For the picklist, see the **Value 2 display** parameter (→ 🖺 22)

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 (→ 🖺 17) 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 (→ 🖺 61).

0% bargraph value 3

Navigation	🖩🖳 Expert → System → Display → 0% bargraph 3 (0124)

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

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

User entry	Signed floating-point number

Factory setting	Country-specific: • 0 kg/h • 0 lb/min

Additional information	*Description*

The **Format display** parameter (→ 🖺 17) is used to specify that the measured value is to be displayed as a bar graph.

User entry

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

100% bargraph value 3

Navigation	🖩🖳 Expert → System → Display → 100% bargraph 3 (0126)

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

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

User entry	Signed floating-point number

Factory setting	0

Additional information	*Description*

The **Format display** parameter (→ 🖺 17) is used to specify that the measured value is to be displayed as a bar graph.

User entry

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

Decimal places 3 🔒

Navigation	🗏🖳 Expert → System → Display → Decimal places 3 (0118)
Prerequisite	A measured value is specified in the **Value 3 display** parameter (→ 🖺 23).
Description	Use this function to select the number of decimal places for measured value 3.
Selection	▪ x ▪ x.x ▪ x.xx ▪ x.xxx ▪ x.xxxx
Factory setting	x.xx
Additional information	*Description*

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

Value 4 display 🔒

Navigation	🗏🖳 Expert → System → Display → Value 4 display (0109)
Prerequisite	A local display is provided.
Description	Use this function to select one of the measured values to be shown on the local display.
Selection	For the picklist, see the **Value 2 display** parameter (→ 🖺 22)
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 (→ 🗎 17) 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 (→ 🗎 61).

Decimal places 4

Navigation   🎛️🖳 Expert → System → Display → Decimal places 4 (0119)

Prerequisite   A measured value is specified in the **Value 4 display** parameter (→ 🗎 25).

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 (→ 🖺 19) to **Value 4 display** parameter (→ 🖺 25) 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 (→ 🖺 17).

Custody transfer measurement

> Only available for Promass F, O, Q and X.

Once the measuring device has been enabled for custody transfer mode, depending on the custody transfer approval selected the display can switch between showing the relevant information and the custody transfer counter.

> For detailed information on custody transfer mode, see the Special Documentation for the device → 🖺 8

Display damping 🔒

Navigation   🔲🔲 Expert → System → Display → Display damping (0094)

Prerequisite   A local display is provided.

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

User entry   0.0 to 999.9 s

Factory setting   0.0 s

Additional information   *User entry*

Use this function to enter a time constant (PT1 element [1]) 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)

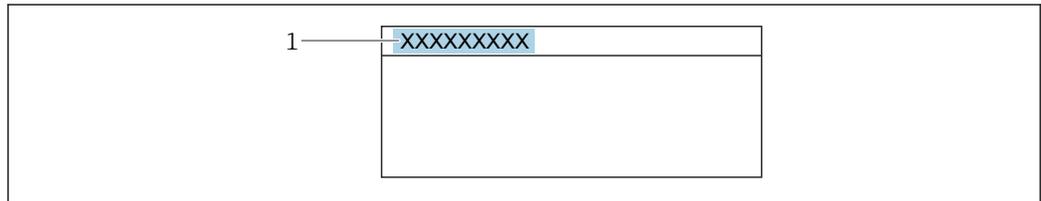**Prerequisite**   A local display is provided.

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

---

[1]   proportional transmission behavior with first order delay

Selection	• Device tag
	• Free text

Factory setting	Device tag

Additional information	*Description*

The header text only appears during normal operation.

1   Position of the header text on the display

Selection

• Device tag
  Is defined in the **Device tag** parameter (→ 🖺 190).
• Free text
  Is defined in the **Header text** parameter (→ 🖺 28).

Header text   🔒

Navigation	🞕🖳 Expert → System → Display → Header text (0112)

Prerequisite	In the **Header** parameter (→ 🖺 27), the **Free text** option is selected.

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

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

Factory setting	------------

Additional information	*Description*

The header text only appears during normal operation.
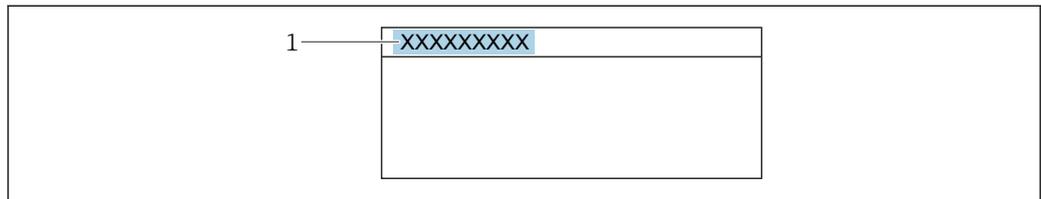
1   Position of the header text on the display

User entry

The number of characters displayed depends on the characters used.

Separator	⌂

Navigation	▣▢ Expert → System → Display → Separator (0101)
Prerequisite	A local display is provided.
Description	Use this function to select the decimal separator.
Selection	▪ . (point) ▪ , (comma)
Factory setting	. (point)

Contrast display	

Navigation	▣▢ Expert → System → Display → Contrast display (0105)
Prerequisite	A local display is provided.
Description	Use this function to enter a value to adapt the display contrast to the ambient conditions (e.g. the lighting or viewing angle).
User entry	20 to 80 %
Factory setting	Depends on the display

Backlight	

Navigation	▣▢ Expert → System → Display → Backlight (0111)
Prerequisite	One of the following conditions is met: • Order code for "Display; operation", option **F** "4-line, illum.; touch control" • Order code for "Display; operation", option **G** "4-line, illum.; touch control +WLAN"
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

▸ **Configuration backup**		
	Operating time	→ 🖺 30
	Last backup	→ 🖺 30
	Configuration management	→ 🖺 30
	Backup state	→ 🖺 31
	Comparison result	→ 🖺 32

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)

Configuration management　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　🔒

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 data

Factory setting　　　　　Cancel

Additional information　　*Selection*

Options	Description
Cancel	No action is executed and the user exits the parameter.
Execute backup	A backup copy of the current device configuration is saved from the integrated HistoROM 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 integrated HistoROM. 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 integrated HistoROM. The following message appears on local display: Comparing files The result can be viewed in **Comparison result** parameter.
Clear backup data	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 progress
　　　　　　　　　　　　　• Restoring in progress
　　　　　　　　　　　　　• Delete in progress
　　　　　　　　　　　　　• Compare in progress
　　　　　　　　　　　　　• Restoring failed
　　　　　　　　　　　　　• Backup failed

Factory setting　　　　　None

Comparison 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	▪ Settings identical ▪ Settings not identical ▪ No backup available ▪ Backup settings corrupt ▪ Check not done ▪ Dataset incompatible
Factory setting	Check not done
Additional information	*Description*

> The comparison is started via the **Compare** option in the **Configuration management** parameter (→ 🖺 30).

Selection

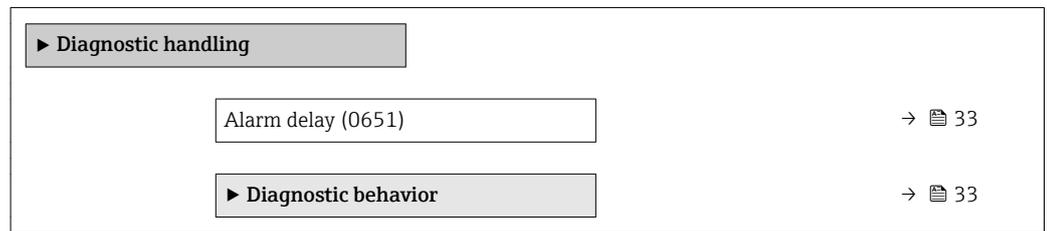| Options	Description
Settings identical	The current device configuration of the HistoROM is identical to the backup copy in the device memory. If the transmitter configuration of another device has been transmitted to the device via HistoROM in the **Configuration management** parameter, the current 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.
Settings not identical	The current device configuration of the HistoROM is not identical to the backup copy in the device memory.
No backup available	There is no backup copy of the device configuration of the HistoROM in the device memory.
Backup settings 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 incompatible	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 "Diagnostic handling" submenu

Navigation   🔘🔲 Expert → System → Diagn. handling

▸ Diagnostic handling	
Alarm delay (0651)	→ 🗎 33
▸ Diagnostic behavior	→ 🗎 33

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.
	ℹ️ 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 exceeded
	• 140 Sensor signal asymmetrical
	• 144 Measuring error too high
	• 830 Sensor temperature too high
	• 831 Sensor temperature too low
	• 832 Electronic temperature too high
	• 833 Electronic temperature too low
	• 834 Process temperature too high
	• 835 Process temperature too low
	• 843 Process limit
	• 862 Partly filled pipe
	• 912 Medium inhomogeneous
	• 913 Medium unsuitable
	• 944 Monitoring failed

"Diagnostic 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 **Diagnostic behavior** submenu (→ 🗎 33).

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

Options	Description
Alarm	The device stops measurement. The measured value output via Modbus RS485 and the totalizers assume the defined alarm condition. A diagnostic message is generated. The background lighting changes to red.
Warning	The device continues to measure. The measured value output via Modbus RS485 and the totalizers are not affected. A diagnostic message is generated.
Logbook entry only	The device continues to measure. The diagnostic message is displayed only in the **Event logbook** submenu (→ 🖹 187) (**Event list** submenu (→ 🖹 188)) and is not displayed in alternation with the operational display.
Off	The diagnostic event is ignored, and no diagnostic message is generated or entered.

📖 For a list of all the diagnostic events, see the Operating Instructions for the device.

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

▶ **Diagnostic behavior**

Assign behavior of diagnostic no. 046 (0709)		→ 🖹 35
Assign behavior of diagnostic no. 140 (0708)		→ 🖹 36
Assign behavior of diagnostic no. 144 (0731)		→ 🖹 36
Assign behavior of diagnostic no. 374 (0710)		→ 🖹 36
Assign behavior of diagnostic no. 441 (0657)		→ 🖹 37
Assign behavior of diagnostic no. 442 (0658)		→ 🖹 37
Assign behavior of diagnostic no. 443 (0659)		→ 🖹 37
Assign behavior of diagnostic no. 444 (0740)		→ 🖹 38
Assign behavior of diagnostic no. 543 (0643)		→ 🖹 38
Assign behavior of diagnostic no. 830 (0800)		→ 🖹 38
Assign behavior of diagnostic no. 831 (0641)		→ 🖹 39

Assign behavior of diagnostic no. 832 (0681)	→ 🕮	39
Assign behavior of diagnostic no. 833 (0682)	→ 🕮	40
Assign behavior of diagnostic no. 834 (0700)	→ 🕮	40
Assign behavior of diagnostic no. 835 (0702)	→ 🕮	40
Assign behavior of diagnostic no. 862 (0679)	→ 🕮	41
Assign behavior of diagnostic no. 912 (0703)	→ 🕮	41
Assign behavior of diagnostic no. 913 (0712)	→ 🕮	41
Assign behavior of diagnostic no. 944 (0732)	→ 🕮	42
Assign behavior of diagnostic no. 948 (0744)	→ 🕮	42

Assign behavior of diagnostic no. 046 (Sensor limit exceeded)   🔒

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 exceeded**.

Selection   ▪ Off
                          ▪ Alarm
                          ▪ Warning
                          ▪ Logbook entry only

Factory setting   Warning

Additional information   ℹ️ For a detailed description of the options available, see → 🕮 33

Assign behavior of diagnostic no. 140 (Sensor signal asymmetrical)

Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 140 (0708)
Description	Use this function to change the diagnostic behavior of the diagnostic message **140 Sensor signal asymmetrical**.
Selection	• Off • Alarm • Warning • Logbook entry only
Factory setting	Warning
Additional information	For a detailed description of the options available, see → 🖺 33

Assign behavior of diagnostic no. 144 (Measuring error too high)

Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 144 (0731)
Description	Option for changing the diagnostic behavior of the diagnostic message **144 Measuring error too high**.
Selection	• Off • Alarm • Warning • Logbook entry only
Factory setting	Alarm
Additional information	For a detailed description of the options available, see → 🖺 33

Assign behavior of diagnostic no. 374 (Sensor electronic (ISEM) faulty)

Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 374 (0710)
Description	Option for changing the diagnostic behavior of the diagnostic message **374 Sensor electronic (ISEM) faulty**.
Selection	• Off • Alarm • Warning • Logbook entry only
Factory setting	Warning
Additional information	For a detailed description of the options available, see → 🖺 33

Assign behavior of diagnostic no. 441 (Current output 1 to n)	🔒

Navigation	🗗🔲 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 441 (0657)
Description	Use this function to change the diagnostic behavior of the diagnostic message **441 Current output 1 to n**.
Selection	• Off • Alarm • Warning • Logbook entry only
Factory setting	Warning
Additional information	ℹ️ For a detailed description of the options available, see → 🖺 33

Assign behavior of diagnostic no. 442 (Frequency 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	Use this function to change the diagnostic behavior of the diagnostic message **442 Frequency output 1 to n**.
Selection	• Off • Alarm • Warning • Logbook entry only
Factory setting	Warning
Additional information	ℹ️ For a detailed description of the options available, see → 🖺 33

Assign behavior of 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	Use this function to change the diagnostic behavior of the diagnostic message **443 Pulse output 1 to n**.
Selection	• Off • Alarm • Warning • Logbook entry only

Factory setting	Warning

Additional information   ℹ️ For a detailed description of the options available, see → 🖹 33

Assign behavior of 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	Use this function to change the diagnostic behavior of the diagnostic message **444 Current input 1 to n**.

Selection	• Off • Alarm • Warning • Logbook entry only

Factory setting	Warning

Additional information   ℹ️ For a detailed description of the options available, see → 🖹 33

Assign behavior of diagnostic no. 543 (Double pulse output)   🔒

Navigation	🖩🖥 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 543 (0643)

Description	Use this function to change the diagnostic behavior of the diagnostic message **543 Double pulse output**.

Selection	• Off • Alarm • Warning • Logbook entry only

Factory setting	Warning

Additional information   ℹ️ For a detailed description of the options available, see → 🖹 33

Assign behavior of diagnostic no. 830 (Sensor temperature too high)   🔒

Navigation	🖩🖥 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 830 (0800)

Description	Use this function to change the diagnostic behavior of the diagnostic message **830 Sensor temperature too high**.

Selection	• Off
	• Alarm
	• Warning
	• Logbook entry only

Factory setting	Alarm

Additional information	For a detailed description of the options available, see → 🖹 33

Assign behavior of diagnostic no. 831 (Sensor temperature too low)

Navigation	圆圆 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 831 (0641)

Description	Use this function to change the diagnostic behavior of the diagnostic message **831 Sensor temperature too low**.

Selection	• Off
	• Alarm
	• Warning
	• Logbook entry only

Factory setting	Alarm

Additional information	For a detailed description of the options available, see → 🖹 33

Assign behavior of diagnostic no. 832 (Electronic temperature too high)

Navigation	圆圆 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 832 (0681)

Description	Use this function to change the diagnostic behavior of the diagnostic message **832 Electronic temperature too high**.

Selection	• Off
	• Alarm
	• Warning
	• Logbook entry only

Factory setting	Logbook entry only

Additional information	For a detailed description of the options available, see → 🖹 33

Assign behavior of diagnostic no. 833 (Electronic temperature too low)

Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 833 (0682)
Description	Use this function to change the diagnostic behavior of the diagnostic message **833 Electronic temperature too low**.
Selection	• Off • Alarm • Warning • Logbook entry only
Factory setting	Logbook entry only
Additional information	For a detailed description of the options available, see → 🖺 33

Assign behavior of diagnostic no. 834 (Process temperature too high)

Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 834 (0700)
Description	Use this function to change the diagnostic behavior of the diagnostic message **834 Process temperature too high**.
Selection	• Off • Alarm • Warning • Logbook entry only
Factory setting	Warning
Additional information	For a detailed description of the options available, see → 🖺 33

Assign behavior of diagnostic no. 835 (Process temperature too low)

Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 835 (0702)
Description	Use this function to change the diagnostic behavior of the diagnostic message **835 Process temperature too low**.
Selection	• Off • Alarm • Warning • Logbook entry only
Factory setting	Warning
Additional information	For a detailed description of the options available, see → 🖺 33

Assign behavior of diagnostic no. 862 (Empty pipe)   🔒

Navigation	🎛️🖥️ Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 862 (0679)
Description	Use this function to change the diagnostic behavior of the diagnostic message **862 Empty pipe**.
Selection	• Off • Alarm • Warning • Logbook entry only
Factory setting	Warning
Additional information	🛈 For a detailed description of the options available, see → 🖺 33

Assign behavior of diagnostic no. 912 (Medium inhomogeneous)   🔒

Navigation	🎛️🖥️ Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 912 (0703)
Description	Option for changing the diagnostic behavior of the diagnostic message **912 Medium inhomogeneous**.
Selection	• Off • Alarm • Warning • Logbook entry only
Factory setting	Warning
Additional information	🛈 For a detailed description of the options available, see → 🖺 33

Assign behavior of diagnostic no. 913 (Medium unsuitable)   🔒

Navigation	🎛️🖥️ Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 913 (0712)
Description	Option for changing the diagnostic behavior of the diagnostic message **913 Medium unsuitable**.
Selection	• Off • Alarm • Warning • Logbook entry only
Factory setting	Warning
Additional information	🛈 For a detailed description of the options available, see → 🖺 33

Assign behavior of diagnostic no. 944 (Monitoring failed)   🔒

Navigation	🖩🖳 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 944 (0732)
Description	Option for changing the diagnostic behavior of the diagnostic message **944 Monitoring failed**.
Selection	• Off • Alarm • Warning • Logbook entry only
Factory setting	Warning
Additional information	ℹ️ For a detailed description of the options available, see → 🗎 33

Assign behavior of diagnostic no. 948 (Oscillation damping too high)   🔒

Navigation	🖩🖳 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 948 (0744)
Description	Option for changing the diagnostic behavior of the diagnostic message **948 Oscillation damping too high**.
Selection	• Off • Alarm • Warning • Logbook entry only
Factory setting	Warning
Additional information	ℹ️ For a detailed description of the options available, see → 🗎 33

3.1.4   "Administration" submenu

Navigation   🖩🖳 Expert → System → Administration

▶ **Administration**	
▶ Define access code	→ 🗎 43
▶ Reset access code	→ 🗎 44
Device reset (0000)	→ 🗎 45

Activate SW option (0029)	→ 🗎 45
Software option overview (0015)	→ 🗎 46

"Define access code" wizard

🛈 The **Define access code** wizard (→ 🗎 43) is only available when operating via the local display or Web browser.

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

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

▶ Define access code	
Define access code	→ 🗎 43
Confirm access code	→ 🗎 44

Define 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 **Enter access code** parameter (→ 🗎 14). 🛈 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 access 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

```
▶ Reset access code

        Operating time (0652)                    → 🗎 44

        Reset access code (0024)                  → 🗎 44
```

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 access 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 settings
                          • Restart device
                          • Restore S-DAT backup

Factory setting   Cancel

Additional information   *Selection*

Options	Description
Cancel	No action is executed and the user exits the parameter.
To delivery settings	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.
Restore S-DAT backup	Restore the data that are saved on the S-DAT. The data record is restored from the electronics memory to the S-DAT.

Activate SW option	🔒

Navigation   ⊞⊟ Expert → System → Administration → Activate SW opt. (0029)

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

User entry	Max. 10-digit string consisting of numbers.
Factory setting	Depends on the software option ordered

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

User entry

i 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 **Software option overview** parameter (→ 🖺 46).

↳ 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"

i The software options currently enabled are displayed in the **Software option overview** parameter (→ 🖺 46).

Web browser

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

Software option overview

Navigation	🔲🔳 Expert → System → Administration → SW option overv. (0015)
Description	Displays all the software options that are enabled in the device.
User interface	▪ Extended HistoROM ▪ Heartbeat Verification ▪ Heartbeat Monitoring ▪ Concentration ▪ Viscosity ▪ Custody transfer

Additional information   *Description*

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

"Extended HistoROM" option

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

"Heartbeat Verification" option and "Heartbeat Monitoring" option

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

"Concentration" option

Order code for "Application package", option **ED** "Concentration" and option **EE** "Special density"

"Viscosity" option

```
ℹ  Only available for Promass I.
```

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

"Custody transfer" option

The measuring device has an approval for custody transfer measurement.

```
ℹ  Detailed information on the national and international approvals for custody transfer
   that are currently available can be supplied by your Endress+Hauser sales
   organization.
```

3.2 "Sensor" submenu

Navigation   Expert → Sensor

```
▸ Sensor

            ▸ Measured values            → 🖹 48

            ▸ System units               → 🖹 61

            ▸ Process parameters         → 🖹 76

            ▸ Measurement mode           → 🖹 84

            ▸ External compensation      → 🖹 86

            ▸ Calculated values          → 🖹 89

            ▸ Sensor adjustment          → 🖹 92

            ▸ Calibration                → 🖹 99
```

3.2.1   "Measured values" submenu

Navigation   ⊞⊟   Expert → Sensor → Measured val.

```
‣ Measured values

        ‣ Process variables                     → 🖺 48

        ‣ Totalizer                             → 🖺 54

        ‣ Input values                          → 🖺 55

        ‣ Output values                         → 🖺 57
```

"Process variables" submenu

Navigation   ⊞⊟   Expert → Sensor → Measured val. → Process variab.

```
‣ Process variables

        Mass flow (1838)                        → 🖺 49

        Volume flow (1847)                      → 🖺 49

        Corrected volume flow (1851)            → 🖺 49

        Density (1850)                          → 🖺 49

        Reference density (1852)                → 🖺 50

        Temperature (1853)                      → 🖺 50

        Pressure value (6129)                   → 🖺 50

        Dynamic viscosity (1854)                → 🖺 51

        Kinematic viscosity (1857)              → 🖺 51

        Temp. compensated dynamic viscosity
        (1872)                                  → 🖺 51

        Temp. compensated kinematic viscosity
        (1863)                                  → 🖺 52

        Concentration (1887)                    → 🖺 52

        Target mass flow (1864)                 → 🖺 53

        Carrier mass flow (1865)                → 🖺 53
```

Mass flow

Navigation	Expert → Sensor → Measured val. → Process variab. → Mass flow (1838)
Description	Displays the mass flow that is currently measured.
User interface	Signed floating-point number
Additional information	*Dependency*

The unit is taken from the **Mass flow unit** parameter (→ 🖺 62)

Volume flow

Navigation	Expert → Sensor → Measured val. → Process variab. → Volume flow (1847)
Description	Displays the volume flow currently calculated.
User interface	Signed floating-point number
Additional information	*Description*

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

Dependency

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

Corrected volume 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 **Corrected volume flow unit** parameter (→ 🖺 65)

Density

Navigation	Expert → Sensor → Measured val. → Process variab. → Density (1850)
Description	Displays the density currently measured.

User interface	Signed floating-point number

Additional information	*Dependency*
	The unit is taken from the **Density unit** parameter (→ 🖺 67)

Reference density

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

Description	Displays the reference density currently calculated.

User interface	Signed floating-point number

Additional information	*Dependency*
	The unit is taken from the **Reference density unit** parameter (→ 🖺 67)

Temperature

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

Description	Displays the medium temperature currently measured.

User interface	Signed floating-point number

Additional information	*Dependency*
	The unit is taken from the **Temperature unit** parameter (→ 🖺 68)

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

Dynamic viscosity

Navigation	Expert → Sensor → Measured val. → Process variab. → Dynam. viscosity (1854)
Prerequisite	For the following order code: "Application package", option **EG** "Viscosity" The software options currently enabled are displayed in the **Software option overview** parameter (→ 🖺 46).
Description	Displays the dynamic viscosity currently calculated.
User interface	Signed floating-point number
Additional information	*Dependency* The unit is taken from the **Dynamic viscosity unit** parameter.

Kinematic viscosity

Navigation	Expert → Sensor → Measured val. → Process variab. → Kinematic visc. (1857)
Prerequisite	For the following order code: "Application package", option **EG** "Viscosity" The software options currently enabled are displayed in the **Software option overview** parameter (→ 🖺 46).
Description	Displays the kinematic viscosity currently calculated.
User interface	Signed floating-point number
Additional information	*Dependency* The unit is taken from the **Kinematic viscosity unit** parameter (0578).

Temp. compensated dynamic viscosity

Navigation	Expert → Sensor → Measured val. → Process variab. → TempCompDynVisc (1872)
Prerequisite	For the following order code: "Application package", option **EG** "Viscosity" The software options currently enabled are displayed in the **Software option overview** parameter (→ 🖺 46).
Description	Displays the temperature compensation currently calculated for the viscosity.
User interface	Signed floating-point number

Additional information   *Dependency*

ℹ The unit is taken from the **Dynamic viscosity unit** parameter.

Temp. compensated kinematic viscosity

Navigation   🖩🖳   Expert → Sensor → Measured val. → Process variab. → TempCompKinVisc (1863)

Prerequisite   For the following order code:
                        "Application package", option **EG** "Viscosity"

                        ℹ The software options currently enabled are displayed in the **Software option overview** parameter (→ 🖺 46).

Description   Displays the temperature compensation currently calculated for the kinetic viscosity.

User interface   Signed floating-point number

Additional information *Dependency*

                        ℹ The unit is taken from the **Kinematic viscosity unit** parameter (0578).

Concentration

Navigation   🖩🖳   Expert → Sensor → Measured val. → Process variab. → Concentration (1887)

Prerequisite   For the following order code:
                        "Application package", option **ED** "Concentration"

                        ℹ The software options currently enabled are displayed in the **Software option overview** parameter (→ 🖺 46).

Description   Displays the concentration currently calculated.

User interface   Signed floating-point number

Additional information *Dependency*

                        ℹ The unit is taken from the **Concentration 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 **WT-%** option or the **User conc.** option is selected in the **Concentration unit** parameter. ⓘ The software options currently enabled are displayed in the **Software option overview** parameter (→ 🖺 46).
Description	Displays the mass flow currently measured for the target medium.
User interface	Signed floating-point number
Additional information	*Dependency* ⓘ The unit is taken from the **Mass flow unit** parameter (→ 🖺 62)

Carrier mass flow

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 **WT-%** option or the **User conc.** option is selected in the **Concentration unit** parameter. ⓘ The software options currently enabled are displayed in the **Software option overview** parameter (→ 🖺 46).
Description	Displays the mass flow currently measured for the carrier medium.
User interface	Signed floating-point number
Additional information	*Dependency* ⓘ The unit is taken from the **Mass flow unit** parameter (→ 🖺 62)

"Totalizer" submenu

Navigation   ⓘ🖲 Expert → Sensor → Measured val. → Totalizer

▸ Totalizer		
Totalizer value 1 to n (0911–1 to n)	→	🗎 54
Totalizer overflow 1 to n (0910–1 to n)	→	🗎 55
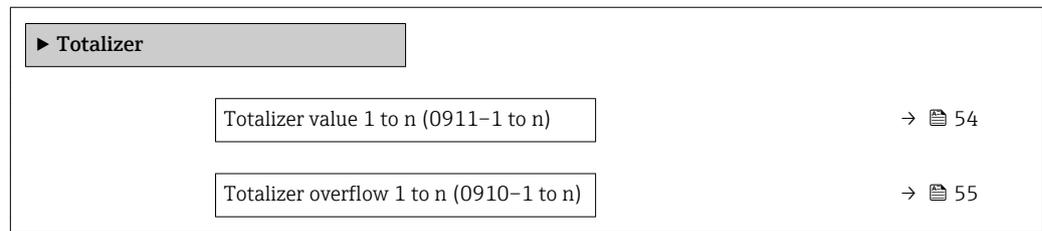
Totalizer value 1 to n

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

Prerequisite   A process variable is selected in the **Assign process variable** parameter (→ 🗎 175) of the **Totalizer 1 to n** submenu.

Description   Displays the current totalizer reading.

User interface   Signed floating-point number

Additional information   *Description*

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

                              ⓘ In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→ 🗎 178).

                              User interface

                              The value of the process variable totalized since measuring began can be positive or negative. This depends on the settings in the **Totalizer operation mode** parameter (→ 🗎 176).

                              ⓘ The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 🗎 175).

                              Example

                              Calculation of the current totalizer reading when the value exceeds the 7-digit display range of the operating tool:
                              • Value in the **Totalizer value 1** parameter: $1\,968\,457\ \mathrm{m}^3$
                              • Value in the **Totalizer overflow 1** parameter: $1 \cdot 10^7$ (1 overflow) = $10\,000\,000\ [\mathrm{m}^3]$
                              • Current totalizer reading: $11\,968\,457\ \mathrm{m}^3$

Totalizer overflow 1 to n	🔒

Navigation	🔲🖳 Expert → Sensor → Measured val. → Totalizer → Tot. overflow 1 to n (0910–1 to n)
Prerequisite	A process variable is selected in the **Assign process variable** parameter (→ 📄 175) of the **Totalizer 1 to n** submenu.
Description	Displays the current totalizer overflow.
User interface	Integer with sign
Additional information	*Description*

Description

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

User interface

ℹ️ The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 📄 175).

Example

Calculation of the current totalizer reading when the value exceeds the 7-digit display range of the operating tool:
- Value in the **Totalizer value 1** parameter: $1\,968\,457$ m^3
- Value in the **Totalizer overflow 1** parameter: $2 \cdot 10^7$ (2 overflows) $= 20\,000\,000$ [m^3]
- Current totalizer reading: $21\,968\,457$ m^3

"Input values" submenu

Navigation   🔲🖳   Expert → Sensor → Measured val. → Input values

‣ **Input values**

‣ **Current input 1 to n**	→ 📄 56
‣ **Value status input 1 to n**	→ 📄 56

"Current input 1 to n" submenu

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

```
▶ Current input 1 to n
```

Measured values 1 to n (1603–1 to n)	→ 🔲 56
Measured current 1 to n (1604–1 to n)	→ 🔲 56

Measured values 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

Measured current 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

```
▶ Value status input 1 to n
```

Value status input (1353–1 to n)	→ 🔲 57

Value status input

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

```
▸ Output values

        ▸ Value current output 1 to n                    → 🖹 57

        ▸ Pulse/frequency/switch output 1                → 🖹 58
          to n

        ▸ Relay output 1 to n                            → 🖹 60

        ▸ Double pulse output                            → 🖹 61
```

"Value current output 1 to n" submenu

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

```
▸ Value current output 1 to n

        Output current 1 to n (0361–1 to n)              → 🖹 57

        Measured current 1 to n (0366–1 to n)            → 🖹 58
```

Output current 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

Measured current 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

▶ Pulse/frequency/switch output 1 to n	
Output frequency 1 to n (0471–1 to n)	→ 🔖 58
Value per pulse (0455–1 to n)	→ 🔖 59
Switch status 1 to n (0461–1 to n)	→ 🔖 59

Output frequency 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 (→ 🔖 127), 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

Value per pulse	🔒

Navigation	🔚🖳 Expert → Sensor → Measured val. → Output values → PFS output 1 to n → Value per pulse (0455–1 to n)
Prerequisite	In the **Operating mode** parameter (→ 🗎 127), the **Pulse** option is selected and one of the following options is selected in the **Assign pulse output** parameter (→ 🗎 128): • Mass flow • Volume flow • Corrected volume flow • Target mass flow [*] • Carrier mass flow [*]
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 → 🗎 230
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.

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 (→ 🗎 127).
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.

---

* Visibility depends on order options or device settings

"Relay output 1 to n" submenu

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

```
▶ Relay output 1 to n
```

Switch status (0801–1 to n)	→ 🔖 60
Switch cycles (0815–1 to n)	→ 🔖 60
Max. switch cycles number (0817–1 to n)	→ 🔖 60

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   • Open
     • Closed

Additional information   *User interface*

     • 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. switch cycles number

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

"Double pulse output" submenu

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

```
▶ Double pulse output

                  Pulse output (0987)                          →  🖺 61
```
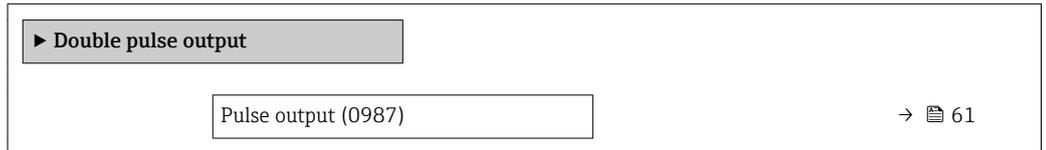
Pulse output

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

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

User interface   Positive floating-point number

Additional information   For a detailed description and example: **Pulse output** parameter (→ 🖺 132)

3.2.2   "System units" submenu

Navigation   ⊞⊟ Expert → Sensor → System units

```
▶ System units

                  Mass flow unit (0554)                        →  🖺 62

                  Mass unit (0574)                             →  🖺 63

                  Volume flow unit (0553)                      →  🖺 63

                  Volume unit (0563)                           →  🖺 65

                  Corrected volume flow unit (0558)            →  🖺 65

                  Corrected volume unit (0575)                 →  🖺 66

                  Density unit (0555)                          →  🖺 67
```
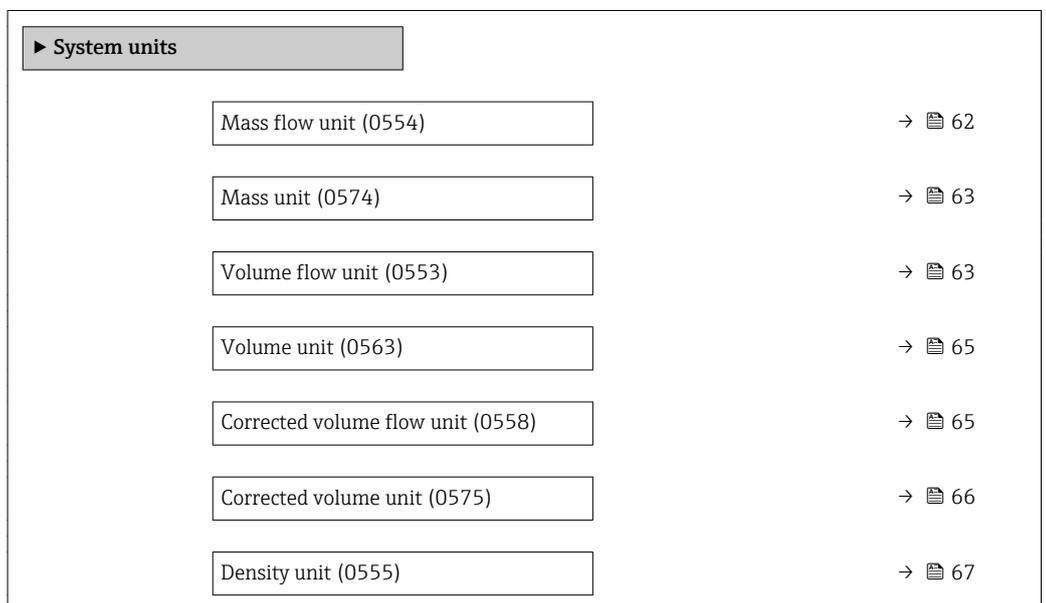
Reference density unit (0556)	→ 🖹 67
Temperature unit (0557)	→ 🖹 68
Pressure unit (0564)	→ 🖹 69
Date/time format (2812)	→ 🖹 69
▸ User-specific units	→ 🖹 70

Mass flow unit

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

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

Selection
SI units
- g/s
- g/min
- g/h
- g/d
- kg/s
- kg/min
- kg/h
- kg/d
- t/s
- t/min
- t/h
- t/d

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

Custom-specific units
- User mass/s
- User mass/min
- User mass/h
- User mass/d

Factory setting   Country-specific:
- kg/h (DN > 150 (6"): t/h)
- lb/min

Additional information   *Result*

The selected unit applies for:
• **Target mass flow** parameter (→ 🖺 53)
• **Carrier mass flow** parameter (→ 🖺 53)
• **Mass flow** parameter (→ 🖺 49)

Selection

ℹ️ For an explanation of the abbreviated units: → 🖺 235

Customer-specific units

ℹ️ The unit for the customer-specific mass is specified in the **User mass text** parameter (→ 🖺 70).

Mass unit   🔒

Navigation   ◎◙⊟ Expert → Sensor → System units → Mass unit (0574)

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

Selection   *SI units*   *US units*
                        • g   • oz
                        • kg   • lb
                        • t   • STon

                        Custom-specific units
                        User mass

Factory setting   Country-specific:
                        • kg (DN > 150 (6"): t)
                        • lb

Additional information *Selection*

                        ℹ️ For an explanation of the abbreviated units: → 🖺 235

                        Customer-specific units

                        ℹ️ The unit for the customer-specific mass is specified in the **User mass text** parameter (→ 🖺 70).

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

Custom-specific units
- User vol./s
- User vol./min
- User vol./h
- User vol./d

Factory setting

Country-specific:
- l/h (DN > 150 (6"): m³/h)
- gal/min (us)

Additional information	*Result* The selected unit applies for: **Volume flow** parameter (→ 🗎 49) *Selection* ℹ️ For an explanation of the abbreviated units: → 🗎 235 *Customer-specific units* ℹ️ The unit for the customer-specific volume is specified in the **User volume text** parameter (→ 🗎 72).

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 *Custom-specific units* User vol.	*US units* • af • ft³ • fl oz (us) • gal (us) • kgal (us) • Mgal (us) • bbl (us;oil) • bbl (us;liq.) • bbl (us;beer) • bbl (us;tank)	*Imperial units* • gal (imp) • Mgal (imp) • bbl (imp;beer) • bbl (imp;oil)
Factory setting	Country-specific: • l (DN > 150 (6"): m³) • gal (us)		
Additional information	*Selection* ℹ️ For an explanation of the abbreviated units: → 🗎 235 *Customer-specific units* ℹ️ The unit for the customer-specific volume is specified in the **User volume text** parameter (→ 🗎 72).		

Corrected volume flow unit   🔒

Navigation	🖳🖥 Expert → Sensor → System units → Cor.volflow unit (0558)
Description	Use this function to select the unit for the corrected volume flow.

Selection	*SI units* • Nl/s • Nl/min • Nl/h • Nl/d • 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)
	Custom-specific units • UserCrVol./s • UserCrVol./min • UserCrVol./h • UserCrVol./d		

Factory setting
Country-specific:
• Nl/h (DN > 150 (6"): Nm³/h)
• Sft³/min

Additional information
Result

The selected unit applies for:
Corrected volume flow parameter (→ 🕮 49)

Selection

ℹ️ For an explanation of the abbreviated units: → 🕮 235

Corrected volume unit   🔒

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

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

Selection	*SI units* • Nl • Nm³ • Sm³	*US units* • Sft³ • Sgal (us) • Sbbl (us;liq.)	*Imperial units* Sgal (imp)
	Custom-specific units UserCrVol.		

Factory setting
Country-specific:
• Nl (DN > 150 (6"): Nm³)
• Sft³

Additional information
Selection

ℹ️ For an explanation of the abbreviated units: → 🕮 235

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
- kg/dm³
- kg/l
- kg/m³
- SD4℃
- SD15℃
- SD20℃
- SG4℃
- SG15℃
- SG20℃

Custom-specific units
User dens.

US units
- lb/ft³
- lb/gal (us)
- lb/bbl (us;liq.)
- lb/bbl (us;beer)
- lb/bbl (us;oil)
- lb/bbl (us;tank)

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

Factory setting   Country-specific:
- kg/l
- lb/ft³

Additional information   *Result*

The selected unit applies for:
- **Density setpoint 1** parameter
- **Density setpoint 2** parameter
- **Density** parameter (→ 🖺 49)

Selection

- SD = specific density
  The specific density is the ratio of the fluid density to the water density at a water temperature of +4 ℃ (+39 ℉), +15 ℃ (+59 ℉), +20 ℃ (+68 ℉).
- SG = specific gravity
  The specific gravity is the ratio of the fluid density to the water density at a water temperature of +4 ℃ (+39 ℉), +15 ℃ (+59 ℉), +20 ℃ (+68 ℉).

ℹ️ For an explanation of the abbreviated units: → 🖺 235

Customer-specific units

ℹ️ The unit for the customer-specific density is specified in the **User density text** parameter (→ 🖺 74).

Reference density 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	*US units* lb/Sft³

Factory setting	Country-dependent • kg/Nl • lb/Sft³

Additional information	*Result* The selected unit applies for: • **External reference density** parameter (→ 🗎 90) • **Fixed reference density** parameter (→ 🗎 90) • **Reference density** parameter (→ 🗎 50) *Selection* ℹ️ For an explanation of the abbreviated units: → 🗎 235

Temperature unit   🔒

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

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

Selection	*SI units* • °C • K	*US units* • °F • °R

Factory setting	Country-specific: • °C • °F

Additional information	*Result* The selected unit applies for: • **Maximum value** parameter (→ 🗎 209) • **Minimum value** parameter (→ 🗎 209) • **Maximum value** parameter (→ 🗎 210) • **Minimum value** parameter (→ 🗎 210) • **Maximum value** parameter (→ 🗎 211) • **Minimum value** parameter (→ 🗎 211) • **External temperature** parameter (→ 🗎 88) • **Reference temperature** parameter (6222) • **Temperature** parameter (→ 🗎 50) • **Reference temperature** parameter (→ 🗎 90) *Selection* ℹ️ For an explanation of the abbreviated units: → 🗎 235

Pressure unit	🔒

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

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

Selection	*SI units*	*US units*
	• Pa a	• psi a
	• kPa a	• psi g
	• MPa a	
	• bar	
	• Pa g	
	• kPa g	
	• MPa g	
	• bar g	
	Custom-specific units	
	User pres.	

Factory setting	Country-specific:
	• bar a
	• psi a

Additional information   *Result*

The unit is taken from:
• **Pressure value** parameter (→ 🖺 87)
• **External pressure** parameter (→ 🖺 87)
• **Pressure value** parameter (→ 🖺 50)

Selection

❗ For an explanation of the abbreviated units: → 🖺 235

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 hh:mm am/pm
	• mm/dd/yy hh:mm
	• mm/dd/yy hh:mm am/pm

Factory setting	dd.mm.yy hh:mm

Additional information   *Selection*

❗ For an explanation of the abbreviated units: → 🖺 235

"User-specific units" submenu

Navigation   ▣▤   Expert → Sensor → System units → User-spec. units

▸ User-specific units	
User mass text (0560)	→ 🗎 70
User mass factor (0561)	→ 🗎 71
User mass offset (0562)	→ 🗎 71
User volume text (0567)	→ 🗎 72
User volume factor (0568)	→ 🗎 72
User corrected volume text (0592)	→ 🗎 73
User corrected volume factor (0590)	→ 🗎 73
User corrected volume offset (0602)	→ 🗎 74
User volume offset (0569)	→ 🗎 72
User density text (0570)	→ 🗎 74
User density factor (0572)	→ 🗎 74
User density offset (0571)	→ 🗎 75
User pressure text (0581)	→ 🗎 75
User pressure factor (0579)	→ 🗎 75
User pressure offset (0580)	→ 🗎 75

User mass text   ⌂

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

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

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

Factory setting   User mass

Additional information   *Result*

> The defined unit is shown as an option in the choose list of the following parameters:
> - **Mass flow unit** parameter (→ 🖺 62)
> - **Mass unit** parameter (→ 🖺 63)

Example

If the text CENT for "centner" is entered, the following options are displayed in the picklist for the **Mass flow unit** parameter (→ 🖺 62):
- CENT/s
- CENT/min
- CENT/h
- CENT/d

User mass factor	🔒

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

User mass offset	🔒

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

User volume text	🔒

Navigation	🔘🖳 Expert → Sensor → System units → User-spec. units → Volume text (0567)
Description	Use this function to enter a text for the user-specific unit of volume and volume flow. The corresponding time units (s, min, h, d) for volume flow are generated automatically.
User entry	Max. 10 characters such as letters, numbers or special characters (@, %, /)
Factory setting	User vol.
Additional information	*Result*

> *Result*
>
> ℹ️ The defined unit is shown as an option in the choose list of the following parameters:
> • **Volume flow unit** parameter (→ 🖺 63)
> • **Volume unit** parameter (→ 🖺 65)
>
> *Example*
>
> If the text GLAS is entered, the choose list of the **Volume flow unit** parameter (→ 🖺 63) shows the following options:
> • GLAS/s
> • GLAS/min
> • GLAS/h
> • GLAS/d

User volume factor	🔒

Navigation	🔘🖳 Expert → Sensor → System units → User-spec. units → Volume factor (0568)
Description	Use this function to enter a quantity factor (without time) for the user-specific volume and volume flow unit.
User entry	Signed floating-point number
Factory setting	1.0

User volume offset	🔒

Navigation	🔘🖳 Expert → Sensor → System units → User-spec. units → Volume offset (0569)
Description	Use this function to enter the offset for adapting the user-specific volume unit and volume flow unit (without time).
User entry	Signed floating-point number
Factory setting	0

Additional information   *Description*

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

---

| User corrected volume text | 🔒 |

Navigation   🔘🖥 Expert → Sensor → System units → User-spec. units → Corr. vol. text (0592)

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

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

Factory setting   UserCrVol.

Additional information   *Result*

> The defined unit is shown as an option in the choose list of the following parameters:
> • **Corrected volume flow unit** parameter (→ 🔖 65)
> • **Corrected volume unit** parameter (→ 🔖 66)

Example

If the text GLAS is entered, the choose list of the **Corrected volume flow unit** parameter (→ 🔖 65) shows the following options:
• GLAS/s
• GLAS/min
• GLAS/h
• GLAS/d

| User corrected volume factor | 🔒 |

Navigation   🔘🖥 Expert → Sensor → System units → User-spec. units → Cor.vol. factor (0590)

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

User entry   Signed floating-point number

Factory setting   1.0

User corrected volume offset	🔒

Navigation	🔘🖥 Expert → Sensor → System units → User-spec. units → Corr vol. offset (0602)
Description	Use this function to enter the offset for adapting the user-specific corrected volume unit and corrected volume flow unit (without time).
	🛈 Value in user-specific unit = (factor × value in base unit) + offset
User entry	Signed floating-point number
Factory setting	0

User density text	🔒

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

User density factor	🔒

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

User density offset	🔒

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

User pressure text	🔒

Navigation	🖩🖥 Expert → Sensor → System units → User-spec. units → Pressure text (0581)
Description	Use this function to enter a text for the user-specific pressure unit.
User entry	Max. 10 characters such as letters, numbers or special characters (@, %, /)
Factory setting	User pres.
Additional information	*Result*
	ℹ The defined unit is shown as an option in the choose list of the **Pressure unit** parameter (→ 🕮 69).

User pressure factor	🔒

Navigation	🖩🖥 Expert → Sensor → System units → User-spec. units → Pressure factor (0579)
Description	Use this function to enter a quantity factor for the user-specific pressure unit.
User entry	Signed floating-point number
Factory setting	1.0
Additional information	*Example*
	1 Dyn/cm² = 0.1 Pa → 10 Dyn/cm² = 1 Pa → user entry: 10

User pressure offset	🔒

Navigation	🖩🖥 Expert → Sensor → System units → User-spec. units → Pressure offset (0580)
Description	Use this function to enter the offset for adapting the user-specific pressure unit.

User entry	Signed floating-point number

Factory setting   0

3.2.3   "Process parameters" submenu

Navigation   ▣▣   Expert → Sensor → Process param.

► Process parameters	
Flow damping (1802)	→ 🖹 76
Density damping (1803)	→ 🖹 77
Temperature damping (1822)	→ 🖹 77
Flow override (1839)	→ 🖹 78
► Low flow cut off	→ 🖹 78
► Partially filled pipe detection	→ 🖹 82

Flow damping   🔒

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

Description   Use this function to enter a time constant for flow damping (PT1 element). Reduction of the variability of the flow measured value (in relation to interference). For this purpose, the depth of the flow filter is adjusted: when the filter setting increases, the reaction time of the device also increases.

User entry   0 to 100.0 s

Factory setting   0 s

Additional information   *Description*

The damping is performed by a PT1 element [2].

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 → 🖹 108
- Low flow cut off → 🖹 78
- Totalizers → 🖹 174

Density damping 🔒

Navigation	🎛🖳 Expert → Sensor → Process param. → Density damping (1803)
Description	Use this function to enter a time constant for the damping (PT1 element) of the density measured value.
User entry	0 to 999.9 s
Factory setting	0 s

Additional information   *Description*

The damping is performed by a PT1 element [3].

User entry

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

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

Temperature damping 🔒

Navigation	🎛🖳 Expert → Sensor → Process param. → Temp. damping (1822)
Description	Use this function to enter a time constant for the damping (PT1 element) of the temperature measured value.
User entry	0 to 999.9 s

---

2) Proportional behavior with first-order lag
3) Proportional behavior with first-order lag

Factory setting	0 s

Additional information	*Description*

The damping is performed by a PT1 element [4].

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

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

Flow override ⓐ

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

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

Selection	• Off • On

Factory setting	Off

Additional information	*Description*

Flow override is active
- The diagnostic message diagnostic message △**C453 Flow override** is displayed.
- Output values
  - Temperature: proceeding output
  - Totalizers 1-3: Stop being totalized

Positive zero return can also be enabled via the Status input: **Assign status input** parameter (→ 🖺 107).

"Low flow cut off" submenu

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

▶ Low flow cut off

	Assign process variable (1837)	→ 🖺 79
	On value low flow cutoff (1805)	→ 🖺 79

---

4) Proportional behavior with first-order lag

| Off value low flow cutoff (1804) | → 🖺 80 |
| Pressure shock suppression (1806) | → 🖺 80 |

Assign process 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
• Corrected volume flow

Factory setting
Mass flow

On value low flow cutoff 🔒

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

Prerequisite
One of the following options is selected in the **Assign process variable** parameter (→ 🖺 79):
• Mass flow
• Volume flow
• Corrected volume flow

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 → 🖺 80.

User entry
Positive floating-point number

Factory setting
Depends on country and nominal diameter → 🖺 230

Additional information
Dependency

The unit depends on the process variable selected in the **Assign process variable** parameter (→ 🖺 79).

Off value low flow cutoff	🔒

Navigation	🔀🔳 Expert → Sensor → Process param. → Low flow cut off → Off value (1804)
Prerequisite	One of the following options is selected in the **Assign process variable** parameter (→ 🗎 79): • Mass flow • Volume flow • Corrected volume flow
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→ 🗎 79.
User entry	0 to 100.0 %
Factory setting	50 %
Additional information	*Example*

A0012887
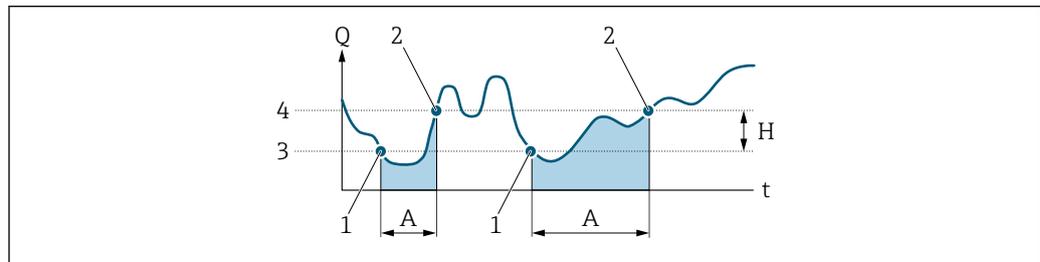
Q   Flow
t   Time
H   Hysteresis
A   Low flow cut off active
1   Low flow cut off is activated
2   Low flow cut off is deactivated
3   On value entered
4   Off value entered

Pressure shock suppression	🔒

Navigation	🔀🔳 Expert → Sensor → Process param. → Low flow cut off → Pres. shock sup. (1806)
Prerequisite	One of the following options is selected in the **Assign process variable** parameter (→ 🗎 79): • Mass flow • Volume flow • Corrected volume flow
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.
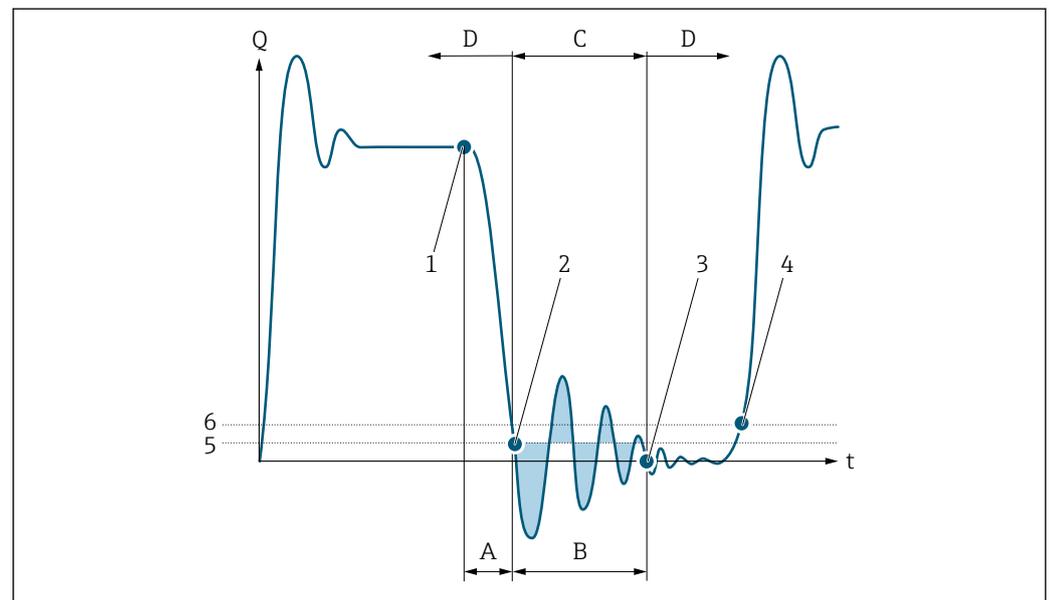
Q   Flow
t   Time
A   Drip
B   Pressure shock
C   Pressure shock suppression active as specified by the time entered
D   Pressure shock suppression inactive
1   Valve closes
2   Flow falls below the on-value of the low flow cut off: pressure shock suppression is activated
3   The time entered has elapsed: 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

"Partially filled pipe detection" submenu

Navigation   Expert → Sensor → Process param. → Partial pipe det

► Partially filled pipe detection	
Assign process variable (1860)	→ 🗎 82
Low value partial filled pipe detection (1861)	→ 🗎 82
High value partial filled pipe detection (1858)	→ 🗎 83
Response time part. filled pipe detect. (1859)	→ 🗎 83
Maximum damping partial filled pipe det. (6040)	→ 🗎 84

Assign process 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 • Reference density
Factory setting	Off

Low value partial filled pipe detection   ⚙

Navigation	Expert → Sensor → Process param. → Partial pipe det → Low value (1861)
Prerequisite	One of the following options is selected in the **Assign process variable** parameter (→ 🗎 82): • Density • Reference density
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 partial filled pipe detection** parameter (→ 🖺 83).
	ℹ️ The unit depends on the process variable selected in the **Assign process variable** parameter (→ 🖺 82).
	Limit value
	ℹ️ If the displayed value is outside the limit value, the measuring device displays the diagnostic message ⚠️**S862 Partly filled pipe**.

High value partial filled pipe detection   🔒

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

Prerequisite	One of the following options is selected in the **Assign process variable** parameter (→ 🖺 82):
	• Density
	• Reference density

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

User entry	Signed floating-point number

Factory setting	6 000

Additional information	*User entry*
	The upper limit value must be greater than the lower limit value defined in the **Low value partial filled pipe detection** parameter (→ 🖺 82).
	ℹ️ The unit depends on the process variable selected in the **Assign process variable** parameter (→ 🖺 82).
	Limit value
	ℹ️ If the displayed value is outside the limit value, the measuring device displays the diagnostic message ⚠️**S862 Partly filled pipe**.

Response time part. filled pipe detect.   🔒

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

Prerequisite	One of the following options is selected in the **Assign process variable** parameter (→ 🖺 82):
	• Density
	• Reference density

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 pipe** to be triggered if the measuring pipe is empty or partially full.
User entry	0 to 100 s
Factory setting	1 s

Maximum damping partial filled pipe det.   🔒

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*

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 pipe**. In the case of non-homogeneous media or air pockets, the damping of the measuring tubes increases.

User entry

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

Example

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

3.2.4   "Measurement mode" submenu

Navigation   🖿🗏 Expert → Sensor → Measurement mode

▶ **Measurement mode**		
	Select medium (6062)	→ 🖺 85
	Select gas type (6074)	→ 🖺 85

| Reference sound velocity (6147) | → 🗎 86 |
| Temperature coefficient sound velocity (6181) | → 🗎 86 |

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 (→ 🗎 85).

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

Selection   • Air
                              • Ammonia NH3
                              • Argon Ar
                              • Sulfur hexafluoride SF6
                              • Oxygen O2
                              • Ozone O3
                              • Nitrogen oxide NOx
                              • Nitrogen N2
                              • Nitrous oxide N2O
                              • Methane CH4
                              • Hydrogen H2
                              • Helium He
                              • Hydrogen chloride HCl
                              • Hydrogen sulfide H2S
                              • Ethylene C2H4
                              • Carbon dioxide CO2
                              • Carbon monoxide 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.

Reference sound velocity   🔒

Navigation   🔒🖳   Expert → Sensor → Measurement mode → Sound velocity (6147)

Prerequisite   In the **Select gas type** parameter (→ 🖺 85), the **Others** option is selected.

Description   Use this function to enter the sound velocity of the gas at 0 ℃ (+32 ℉).

User entry   1 to 99 999.9999 m/s

Factory setting   415.0 m/s

Temperature coefficient sound velocity   🔒

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

Prerequisite   The **Others** option is selected in the **Select gas type** parameter (→ 🖺 85).

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 compensation" submenu

Navigation   🔒🖳   Expert → Sensor → External comp.

▶ External compensation	
Pressure compensation (6130)	→ 🖺 87
Pressure value (6059)	→ 🖺 87
External pressure (6209)	→ 🖺 87
Temperature mode (6184)	→ 🖺 88
External temperature (6080)	→ 🖺 88

Pressure compensation	🔒

Navigation	🔘🖥️ Expert → Sensor → External comp. → Pressure compen. (6130)
Description	Use this function to select the type of pressure compensation.
Selection	• Off • Fixed value • External value • Current input 1 * • Current input 2 * • Current input 3 *
Factory setting	Off

Additional information	*Selection*
	
	• Fixed value
	  A fixed pressure value is used for compensation: **Pressure value** parameter (→ 🗎 87)
	• **Current input 1** option, **Current input 2** option , **Current input 3** option
	  The pressure value read in via the current input is used for compensation.

Pressure value	🔒

Navigation	🔘🖥️ Expert → Sensor → External comp. → Pressure value (6059)
Prerequisite	The **Fixed value** option is selected in the **Pressure compensation** parameter (→ 🗎 87).
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* ℹ️ The unit is taken from the **Pressure unit** parameter (→ 🗎 69)

External pressure	

Navigation	🔘🖥️ Expert → Sensor → External comp. → External press. (6209)
Prerequisite	The **External value** option is selected in the **Pressure compensation** parameter (→ 🗎 87).
Description	Use this function to enter an external pressure value.

---

* Visibility depends on order options or device settings

User entry	Positive floating-point number

Factory setting	0 bar

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

Temperature mode 🔒

Navigation	🔲🔳 Expert → Sensor → External comp. → Temperature mode (6184)

Description	Use this function to select the temperature mode.

Selection	• Internal measured value
	• External value
	• Current input 1 *
	• Current input 2 *
	• Current input 3 *

Factory setting	Internal measured 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 measured value
	The temperature value measured internally (temperature sensor of the measuring
	sensor) is used for compensation.
	• **Current input 1** option, **Current input 2** option ,**Current input 3** option
	The temperature value read in via the current input is used for compensation.

External temperature

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

Prerequisite	In the **Temperature mode** parameter (→ 🗎 88), the **External value** option is selected.

Description	Use this function to enter the external temperature.

User entry	−273.15 to 99 999 ℃

Factory setting	Country-specific:
	• 0 ℃
	• +32 ℉

---

*   Visibility depends on order options or device settings

Additional information   *Description*

🛈 The unit is taken from the **Temperature unit** parameter (→ 🖺 68)

3.2.6   "Calculated values" submenu

Navigation   🔘🖥 Expert → Sensor → Calculated value

```
‣ Calculated values

              ‣ Corrected volume flow calculation           → 🖺 89
```

"Corrected volume flow calculation" submenu

Navigation   🔘🖥 Expert → Sensor → Calculated value → Corr. vol.flow.

```
‣ Corrected volume flow calculation

       Corrected volume flow calculation              → 🖺 89

       External reference density                     → 🖺 90

       Fixed reference density                        → 🖺 90

       Reference temperature                          → 🖺 90

       Linear expansion coefficient                   → 🖺 91

       Square expansion coefficient                   → 🖺 91
```

Corrected volume flow calculation   🔒

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   • Fixed reference density
                       • Calculated reference density
                       • Reference density by API table 53
                       • Current input 1 *
                       • Current input 2 *
                       • Current input 3 *

---

*   Visibility depends on order options or device settings

Factory setting   Calculated reference density

External reference density

Navigation   ⓘⓔ Expert → Sensor → Calculated value → Corr. vol.flow. → Ext. ref.density (6198)

Prerequisite   In the **Corrected volume flow calculation** parameter (→ 🖺 89), the **External reference density** option is selected.

Description   Displays the reference density which is read in externally, e.g. via the current input.

User interface   Floating point number with sign

Additional information   *Dependency*

ℹ The unit is taken from the **Reference density unit** parameter (→ 🖺 67)

Fixed reference density

Navigation   ⓘⓔ Expert → Sensor → Calculated value → Corr. vol.flow. → Fix ref.density (1814)

Prerequisite   The **Fixed reference density** option is selected in the **Corrected volume flow calculation** parameter (→ 🖺 89) 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   *Dependency*

ℹ The unit is taken from the **Reference density unit** parameter (→ 🖺 67)

Reference temperature

Navigation   ⓘⓔ Expert → Sensor → Calculated value → Corr. vol.flow. → Ref. temperature (1816)

Prerequisite   In the **Corrected volume flow calculation** parameter (→ 🖺 89), the **Calculated reference density** option is selected.

Description   Use this function to enter a reference temperature for calculating the reference density.

User entry   −273.15 to 99 999 ℃

Factory setting

Country-specific:
- +20 ℃
- +68 ℉

Additional information

Dependency

The unit is taken from the **Temperature unit** parameter ($\rightarrow$ 🗏 68)

Reference density calculation

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

A0023403

- ρ_N: reference density
- ρ: fluid density currently measured
- t: fluid temperature currently measured
- t_N: reference temperature at which the reference density is calculated (e.g. 20 ℃)
- Δt: $t - t_N$
- α: linear expansion coefficient of the fluid, unit = $[1/K]$; K = Kelvin
- β: square expansion coefficient of the fluid, unit = $[1/K^2]$

Linear expansion coefficient   🔒

Navigation

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

Prerequisite

In the **Corrected volume flow calculation** parameter ($\rightarrow$ 🗏 89), the **Calculated reference density** option is selected.

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

Square expansion coefficient   🔒

Navigation

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

Prerequisite

In the **Corrected volume flow calculation** parameter ($\rightarrow$ 🗏 89), the **Calculated reference density** option is selected.

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

3.2.7 "Sensor adjustment" submenu

Navigation   ⊞⊟ Expert → Sensor → Sensor adjustm.

▶ Sensor adjustment		
Installation direction (1809)	→ 🖹 92
Installation angle roll (6282)	→ 🖹 92
Installation angle pitch (6236)	→ 🖹 93
▶ Zero point adjustment	→ 🖹 93
▶ Process variable adjustment	→ 🖹 94

Installation direction   🔒

Navigation   ⊞⊟ Expert → Sensor → Sensor adjustm. → Install. direct. (1809)

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

Selection   • Flow in arrow direction
                         • Flow against arrow direction

Factory setting   Flow in arrow direction

Additional information   *Description*

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

Installation angle roll   🔒

Navigation   ⊞⊟ Expert → Sensor → Sensor adjustm. → Inst. angle roll (6282)

Prerequisite   Only available on Promass Q.

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

User entry   −180 to 180 ˚

Factory setting   0 ˚

Installation angle pitch	🔒

Navigation	ⓘ🖥 Expert → Sensor → Sensor adjustm. → Inst.angle pitch (6236)
Prerequisite	Only available on Promass Q.
Description	Use this function to enter the installation angle pitch in degrees.
User entry	–180 to 180 ˚
Factory setting	0 ˚

"Zero point adjustment" submenu

ℹ
- 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 adjustment	
Zero point adjustment control (6196)	→ 🖺 93
Progress (2808)	→ 🖺 94

Zero point adjustment control	🔒

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.
	ℹ Observe conditions → 🖺 93.

Selection
- Cancel
- Busy
- Zero point adjust failure
- 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 point adjust failure
  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 %

"Process variable adjustment" submenu

Navigation   Expert → Sensor → Sensor adjustm. → Variable adjust

▶ Process variable adjustment	
Mass flow offset (1831)	→ 🖺 95
Mass flow factor (1832)	→ 🖺 95
Volume flow offset (1841)	→ 🖺 95
Volume flow factor (1846)	→ 🖺 96
Density offset (1848)	→ 🖺 96
Density factor (1849)	→ 🖺 96
Corrected volume flow offset (1866)	→ 🖺 97
Corrected volume flow factor (1867)	→ 🖺 97

Reference density offset (1868)	→	🕮 97
Reference density factor (1869)	→	🕮 98
Temperature offset (1870)	→	🕮 98
Temperature factor (1871)	→	🕮 98

Mass flow offset 🔒

Navigation   🖩🗔 Expert → Sensor → Sensor adjustm. → Variable adjust → Mass flow offset (1831)

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

User entry   Signed floating-point number

Factory setting   0 kg/s

Additional information   *Description*

     🛈 Corrected value = (factor × value) + offset

Mass flow factor 🔒

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

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

User entry   Positive floating-point number

Factory setting   1

Additional information   *Description*

     🛈 Corrected value = (factor × value) + offset

Volume flow offset 🔒

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

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

User entry	Signed floating-point number

Factory setting	0 m³/s

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

Volume flow factor 🔒

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

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

User entry	Positive floating-point number

Factory setting	1

Additional information	*Description*
	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*
	ℹ 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*

    ℹ Corrected value = (factor × value) + offset

Corrected volume flow 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*

    ℹ Corrected value = (factor × value) + offset

Corrected volume flow 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*

    ℹ Corrected value = (factor × value) + offset

Reference density 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*

                           ℹ️ Corrected value = (factor × value) + offset

---

Reference density 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*

                           ℹ️ Corrected value = (factor × value) + offset

---

Temperature 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*

                           ℹ️ Corrected value = (factor × value) + offset

---

Temperature 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	
Calibration factor (6025)	→ 🖺 99
Zero point (6195)	→ 🖺 99
Nominal diameter (2807)	→ 🖺 100
C0 to 5 (6022)	→ 🖺 100

Calibration 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 configuration

        I/O module 1 to n terminal numbers        → 🗎 101
        (3902–1 to n)

        I/O module 1 to n information               → 🗎 101
        (3906–1 to n)

        I/O module 1 to n type (3901–1 to n)        → 🗎 102

        Apply I/O configuration (3907)              → 🗎 102

        Conversion code (2762)                      → 🗎 102
```

I/O module 1 to n terminal numbers

Navigation	🗁🗔 Expert → I/O config. → I/O 1 to n terminals (3902–1 to n)
Description	Displays the terminal numbers used by the I/O module.
User interface	• Not used • 26-27 (I/O 1) • 24-25 (I/O 2) • 22-23 (I/O 3) • 20-21 (I/O 4) *

I/O module 1 to n information

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 • Fieldbus
Additional information	*"Not plugged" option* The I/O module is not plugged in. *"Invalid" option* The I/O module is not plugged correctly. *"Not configurable" option* The I/O module is not configurable. *"Configurable" option* The I/O module is configurable. *"Fieldbus" option* The I/O module is configured for the fieldbus.

---

* Visibility depends on order options or device settings

I/O module 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" • "Output; input 3", option **D** "Configurable I/O initial setting off" • "Output; input 4", option **D** "Configurable I/O initial setting off"
Description	Use this function to select the I/O module type for the configuration of the I/O module.
Selection	• Off • Current output * • Current input * • Status input * • Pulse/frequency/switch output *
Factory setting	Off

Apply I/O configuration	🔒

Navigation	🖩🖵 Expert → I/O config. → Apply I/O config (3907)
Description	Use this function to activate the newly configured I/O module type.
Selection	• No • Yes
Factory setting	No

Conversion code	🔒

Navigation	🖩🖵 Expert → I/O config. → Conversion 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 module type** parameter (→ 🖺 102).

---

* Visibility depends on order options or device settings

3.4 "Input" submenu

Navigation ⎘⎙ Expert → Input

‣ Input

3.4.1 "Current input 1 to n" submenu

Navigation ⎘⎙ Expert → Input → Current input 1 to n

‣ Current input 1 to n

Terminal number

Navigation	⎘⎙ Expert → Input → Current input 1 to n → Terminal no. (1611–1 to n)
Description	Displays the terminal numbers used by the current input module.
User interface	• Not used • 24-25 (I/O 2) • 22-23 (I/O 3) • 20-21 (I/O 4) *
Additional information	*"Not used" option* The current input module does not use any terminal numbers.

---

* Visibility depends on order options or device settings

Signal mode	🔒

Navigation	🔘🖥 Expert → Input → Current input 1 to n → Signal mode (1610–1 to n)
Prerequisite	The measuring device is **not** approved for use in the hazardous area with type of protection Ex-i.
Description	Use this function to select the signal mode for the current input.
Selection	• Passive • Active
Factory setting	Passive

Current span	🔒

Navigation	🔘🖥 Expert → Input → Current input 1 to n → Current span (1605–1 to n)
Description	Use this function to select the current range for the process value output and the upper and lower level for signal on alarm.
Selection	• 4...20 mA • 4...20 mA NAMUR • 4...20 mA US • 0...20 mA
Factory setting	Country-specific: • 4...20 mA NAMUR • 4...20 mA US
Additional information	*Examples* ℹ️ Sample values for the current range: **Current span** parameter (→ 🖩 111)

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 (→ 🖺 104) • Failure mode (→ 🖺 105)
	Configuration examples
	ℹ️ Pay attention to the configuration examples for **4 mA value** parameter (→ 🖺 112).

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*
	ℹ️ Pay attention to the configuration examples for **4 mA value** parameter (→ 🖺 112).

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 (→ 🖺 104).
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 (→ 🖺 106)).

Failure value	🔒

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

Prerequisite   In the **Failure mode** parameter (→ 🖺 105), 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 number (1358–1 to n)	→ 🖺 106
Assign status input (1352–1 to n)	→ 🖺 107
Value status input (1353–1 to n)	→ 🖺 107
Active level (1351–1 to n)	→ 🖺 108
Response time status input (1354–1 to n)	→ 🖺 108

Terminal number	

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

Description   Displays the terminal numbers used by the status input module.

User interface   • Not used
• 24-25 (I/O 2)
• 22-23 (I/O 3)
• 20-21 (I/O 4) *

Additional information   *"Not used" option*

The status input module does not use any terminal numbers.

---

*   Visibility depends on order options or device settings

Assign status input	🔒

Navigation	🔲🔳 Expert → Input → Status input 1 to n → Assign stat.inp. (1352–1 to n)
Description	Use this function to select the function for the status input.
Selection	• Off • Reset totalizer 1 • Reset totalizer 2 • Reset totalizer 3 • Reset all totalizers • Flow override
Factory setting	Off
Additional information	*Custody transfer measurement* ℹ️ Only available for Promass F, O, Q and X. NOTE! Before enabling the measuring device for custody transfer mode, make sure that the **Off** option is selected in the Assign status input. 📖 For detailed information on custody transfer mode, see the Special Documentation for the device → 🗎 8

Additional information	*Selection*
	
	• Off
	  The status input is switched off.
	• Reset totalizer 1...3
	  The individual totalizers are reset.
	• Reset all totalizers
	  All totalizers are reset.
	• Flow override
	  The Flow override (→ 🗎 78) is activated.
	
	ℹ️ Note on the Flow override (→ 🗎 78):
	• The Flow override (→ 🗎 78) 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.

Value status input	

Navigation	🔲🔳 Expert → Input → Status input 1 to n → Val.stat.inp. (1353–1 to n)
Description	Displays the current input signal level.
User interface	• High • Low

Active level	🔒

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

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

Selection   • High
                                • Low

Factory setting   High

Response time status input	🔒

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

```
▶ Output

        ▶ Current output 1 to n                          →  🖹 109

        ▶ Pulse/frequency/switch output 1                →  🖹 124
          to n

        ▶ Relay output 1 to n                            →  🖹 149

        ▶ Double pulse output                            →  🖹 156
```

3.5.1 "Current output 1 to n" submenu

Navigation   🖩🖵   Expert → Output → Curr.output 1 to n

▶ **Current output 1 to n**	
Terminal number (0379–1 to n)	→ 🖹 109
Signal mode (0377–1 to n)	→ 🖹 110
Assign current output 1 to n (0359–1 to n)	→ 🖹 110
Current span (0353–1 to n)	→ 🖹 111
Fixed current (0365–1 to n)	→ 🖹 112
0/4 mA value (0367–1 to n)	→ 🖹 112
20 mA value (0372–1 to n)	→ 🖹 114
Measuring mode (0351–1 to n)	→ 🖹 115
Damping output 1 to n (0363–1 to n)	→ 🖹 120
Response time (0378–1 to n)	→ 🖹 121
Failure mode (0364–1 to n)	→ 🖹 122
Failure current (0352–1 to n)	→ 🖹 124
Output current 1 to n (0361–1 to n)	→ 🖹 124
Measured current 1 to n (0366–1 to n)	→ 🖹 124

Terminal number

Navigation   🖩🖵   Expert → Output → Curr.output 1 to n → Terminal no. (0379–1 to n)

Description   Displays the terminal numbers used by the current output module.

User interface
- Not used
- 24-25 (I/O 2)
- 22-23 (I/O 3)
- 20-21 (I/O 4) *

---

*   Visibility depends on order options or device settings

Additional information   *"Not used" option*

The current output module does not use any terminal numbers.

Signal mode   🔒

Navigation   🔷🔲 Expert → Output → Curr.output 1 to n → Signal mode (0377–1 to n)

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

Selection   • Passive
                         • Active

Factory setting   Passive

Assign current output 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.

                         ℹ️ Detailed description of the options **Oscillation frequency, Oscillation amplitude,
                         Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🔖 19)

Selection   • Off
                         • Mass flow
                         • Volume flow
                         • Corrected volume flow
                         • Target mass flow *
                         • Carrier mass flow *
                         • Density
                         • Reference density
                         • Concentration *
                         • Dynamic viscosity *
                         • Kinematic viscosity *
                         • Temp. compensated dynamic viscosity *
                         • Temp. compensated kinematic viscosity *
                         • Temperature
                         • Carrier pipe temperature *
                         • Electronic temperature
                         • Oscillation frequency 0
                         • Oscillation frequency 1 *
                         • Oscillation amplitude 0 *
                         • Oscillation amplitude 1 *
                         • Frequency fluctuation 0
                         • Frequency fluctuation 1 *
                         • Oscillation damping 0
                         • Oscillation damping 1 *
                         • Oscillation damping fluctuation 0
                         • Oscillation damping fluctuation 1 *

---

*   Visibility depends on order options or device settings

- Signal asymmetry
- Exciter current 0
- Exciter current 1 *
- HBSI *

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*

    ℹ️ • In the event of a device alarm, the current output adopts the value specified in the **Failure mode** parameter (→ 🖺 122).
- If the measured value is outside the measuring range, the diagnostic message ⚠S441 **Current output 1 to n** is displayed.
- The measuring range is specified via the **0/4 mA value** parameter (→ 🖺 112) and **20 mA value** parameter (→ 🖺 114).

"Fixed current" option

The current value is set via the **Fixed current** parameter (→ 🖺 112).

Example

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

---

*   Visibility depends on order options or device settings
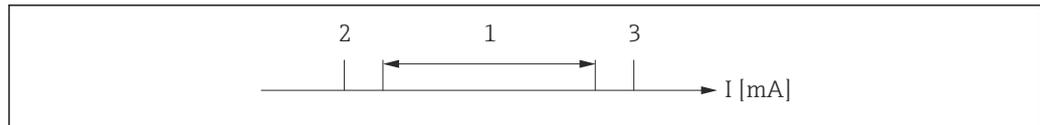
I Current
1 Current span for process value
2 Lower level for signal on alarm
3 Upper level for signal on alarm

Selection

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

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

Fixed current

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

Prerequisite   In the **Current span** parameter (→ 🖺 111), the **Fixed current** option is selected.

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 (→ 🖺 111):
• 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 current output** parameter (→ 🖺 110). 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 (→ 🖺 114).

Dependency

ℹ️ The unit depends on the process variable selected in the **Assign current output** parameter (→ 🖺 110).

Current output behavior

The current output behaves differently depending on the settings configured in the following parameters:
• Current span (→ 🖺 111)
• Failure mode (→ 🖺 122)

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 (→ 🖺 112) = not equal to zero flow (e.g. −250 m³/h)
• **20 mA value** parameter (→ 🖺 114) = not equal to zero flow (e.g. +750 m³/h)
• Calculated current value = 8 mA at zero flow
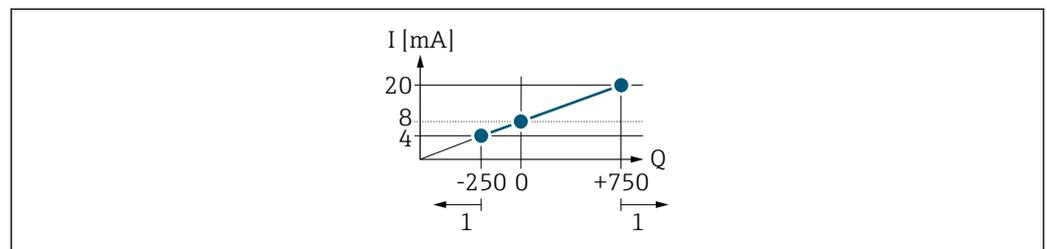
Q   Flow
I   Current
1   Measuring range is exceeded or undershot

The operational range of the measuring device is defined by the values entered for the **0/4 mA value** parameter (→ 🖺 112) and **20 mA value** parameter (→ 🖺 114). If the effective flow exceeds or falls below this operational range, the diagnostic message ⚠S441 **Current output 1 to n** is displayed.

Configuration example B
Measuring mode with **Forward/Reverse flow** option
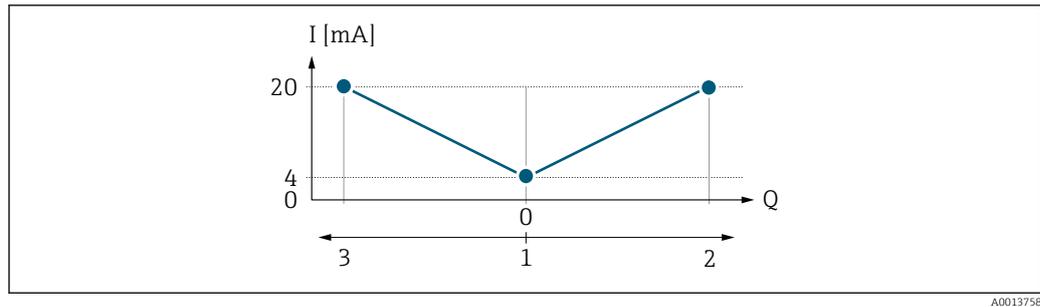
I *Current*
Q *Flow*
1 *Value assigned to the 0/4 mA current*
2 *Forward flow*
3 *Reverse flow*

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 (→ 🖺 112) and **20 mA value** parameter (→ 🖺 114) must have the same sign. The value for the **20 mA value** parameter (→ 🖺 114) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (→ 🖺 114) (e.g. forward flow).

Configuration example C
Measuring mode with **Reverse flow compensation** 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 → 🖺 115.

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 (→ 🖺 111): • 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 → 🖺 229
Additional information	*Description* Positive and negative values are permitted depending on the process variable assigned in the **Assign current output** parameter (→ 🖺 110). 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 (→ 🖺 112).

Dependency

The unit depends on the process variable selected in the **Assign current output** parameter (→ 🖺 110).

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 flow** option is selected in the **Measuring mode** parameter (→ 🖺 115), different signs cannot be entered for the values of the **0/4 mA value** parameter (→ 🖺 112) and **20 mA value** parameter (→ 🖺 114). The diagnostic message ⚠S441 **Current output 1 to n** is displayed.

Configuration examples

Observe the configuration examples for the **0/4 mA value** parameter (→ 🖺 112).

Measuring mode	🔒

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

Prerequisite One of the following options is selected in the **Assign current output** parameter (→ 🖺 110):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *
- Density
- Reference density
- Concentration *
- Dynamic viscosity *
- Kinematic viscosity *
- Temp. compensated dynamic viscosity *
- Temp. compensated kinematic viscosity *
- Temperature
- Carrier pipe temperature *
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1 *
- Oscillation amplitude 0 *
- Oscillation amplitude 1 *
- Frequency fluctuation 0
- Frequency fluctuation 1 *
- Oscillation damping 0
- Oscillation damping 1 *
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1 *

---

*   Visibility depends on order options or device settings

- Signal asymmetry
- Exciter current 0
- Exciter current 1 *
- HBSI *

ℹ️ Detailed description of the options **Oscillation frequency, Oscillation amplitude, Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🖺 19)

One of the following options is selected in the **Current span** parameter (→ 🖺 111):
- 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 flow • Reverse flow compensation
Factory setting	Forward flow
Additional information	*Description*

ℹ️ The process variable that is assigned to the current output via the **Assign current output** parameter (→ 🖺 110) is displayed below the parameter.

"Forward flow" option

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

The flow components outside the scaled measuring range are taken into account for signal output as follows:
- Both values are defined such that they are not equal to zero flow e.g.:
  – 0/4 mA current value = −5 m³/h
  – 20 mA current value = 10 m³/h
- If the effective flow exceeds or falls below this measuring range, the diagnostic message ⚠️**S441 Current output 1 to n** is displayed.

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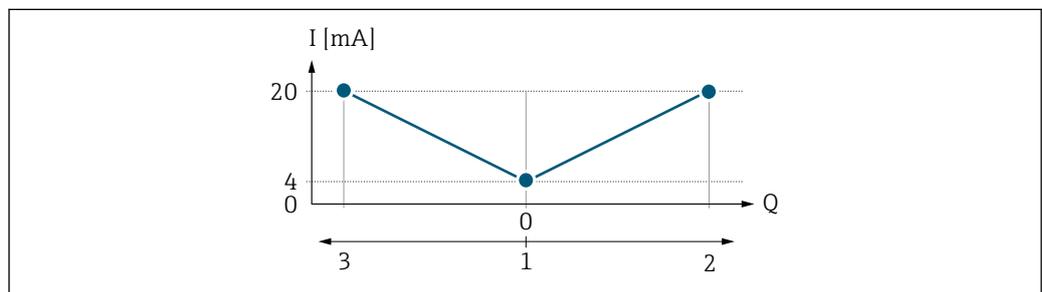
I   Current
Q   Flow
1   Value assigned to the 0/4 mA current
2   Forward flow
3   Reverse flow

---

*   Visibility depends on order options or device settings

- The current output signal is independent of the direction of flow (absolute amount of the measured variable). The values for the **0/4 mA value** parameter (→ 🕮 112) and **20 mA value** parameter (→ 🕮 114) must have the same sign.
- The value for the **20 mA value** parameter (→ 🕮 114) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (→ 🕮 114) (e.g. forward flow).

"Reverse flow compensation" option

The **Reverse flow compensation** 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 **Current output 1 to n** is displayed.

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

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

Examples of how the current output behaves

Example 1

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

A0028084
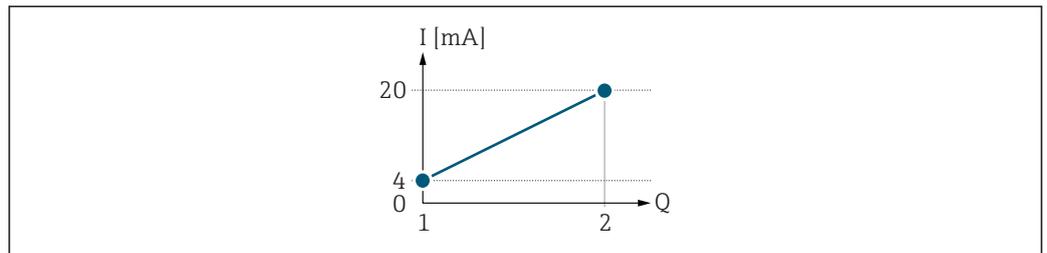
🔲 *2   Measuring range*

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

With the following flow response:

A0028091
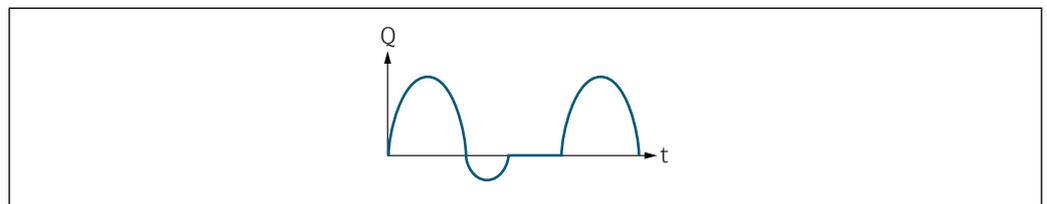
🔲 *3   Flow response*

Q   Flow
t   Time

With the **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:.
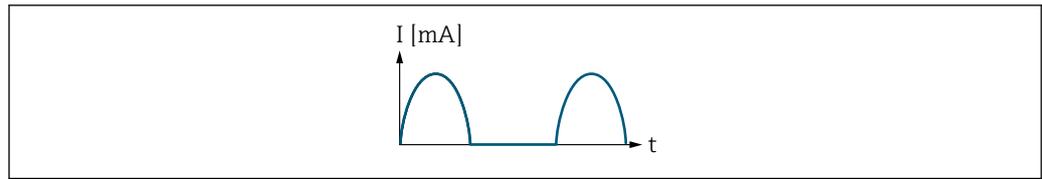
I   *Current*
t   *Time*

With the **Forward/Reverse flow** option

The current output signal is independent of the direction of flow.
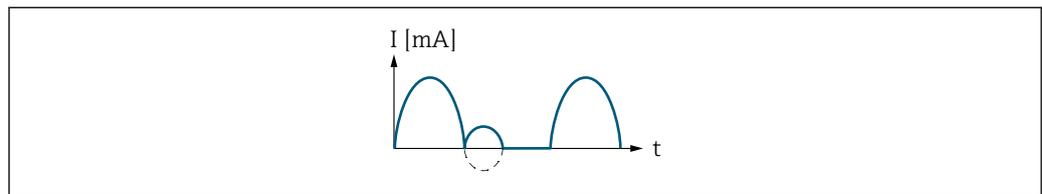
I   *Current*
t   *Time*

With the **Reverse flow compensation** option

Flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.
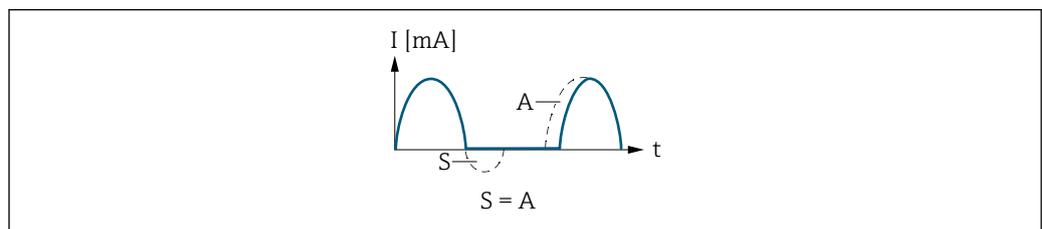
I   *Current*
t   *Time*
S   *Flow components saved*
A   *Balancing of saved flow components*

Example 2

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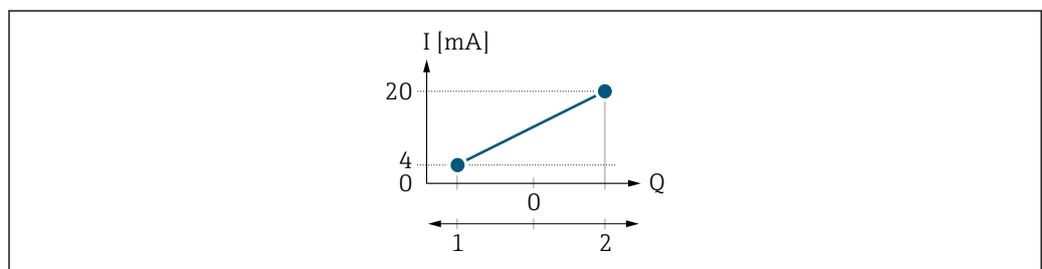
🖼 *4*   *Measuring range*

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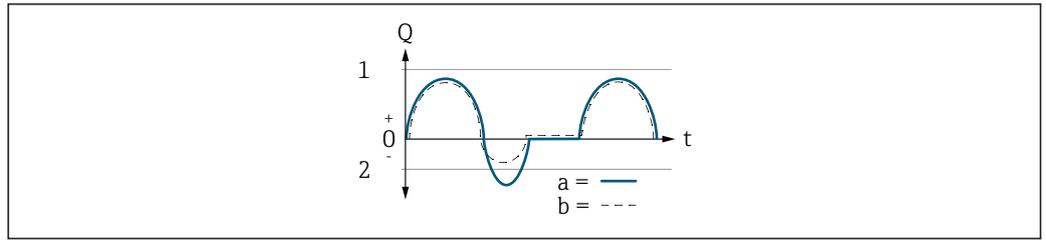
Q   Flow
t   Time
1   Lower range value (value assigned to 0/4 mA current)
2   Upper range value (value assigned to 20 mA current)

With the **Forward flow** option

- a (–): The flow components outside the scaled measuring range cannot be taken into account for signal output.
  The diagnostic message ⚠**S441 Current output 1 to n** is displayed.
- b (- -): The current output signal is proportional to the process variable assigned.
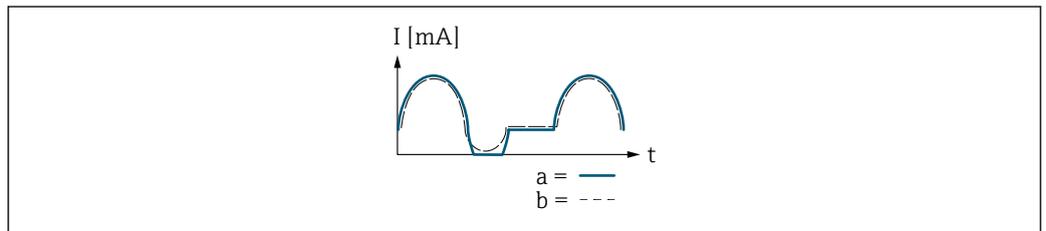
I   Current
t   Time

With the **Forward/Reverse flow** option

This option is not possible in this case as the values for the **0/4 mA value** parameter (→ 🖹 112) and **20 mA value** parameter (→ 🖹 114) have different signs.

With the **Reverse flow compensation** option

Flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.
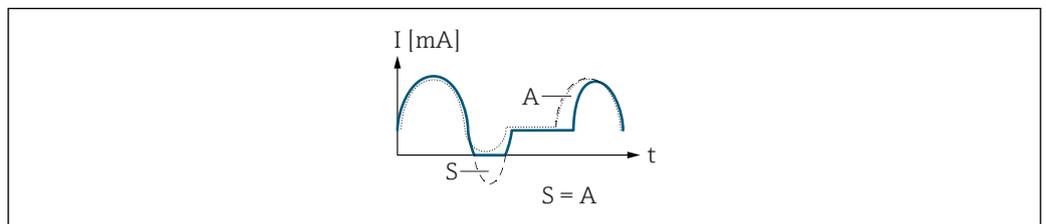
I   Current
t   Time
S   Flow components saved
A   Balancing of saved flow components

Damping output 1 to n	🔒

Navigation	🔳🔲 Expert → Output → Curr.output 1 to n → Damping out. 1 to n (0363–1 to n)

Prerequisite

One of the following options is selected in the **Assign current output** parameter (→ 🖹 110):
• Mass flow
• Volume flow
• Corrected volume flow
• Target mass flow *
• Carrier mass flow *
• Density
• Reference density
• Concentration *
• Dynamic viscosity *
• Kinematic viscosity *
• Temp. compensated dynamic viscosity *
• Temp. compensated kinematic viscosity *
• Temperature
• Carrier pipe temperature *
• Electronic temperature
• Oscillation frequency 0
• Oscillation frequency 1 *
• Oscillation amplitude 0 *
• Oscillation amplitude 1 *
• Frequency fluctuation 0
• Frequency fluctuation 1 *
• Oscillation damping 0
• Oscillation damping 1 *
• Oscillation damping fluctuation 0
• Oscillation damping fluctuation 1 *
• Signal asymmetry
• Exciter current 0
• Exciter current 1 *
• HBSI *

ℹ️ Detailed description of the options **Oscillation frequency, Oscillation amplitude, Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🖹 19)

One of the following options is selected in the **Current span** parameter (→ 🖹 111):
• 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

---

* Visibility depends on order options or device settings

Additional information	*User entry*
	Use this function to enter a time constant (PT1 element [5]) for current output damping:

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

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

Response time

Navigation	⊞⊟ Expert → Output → Curr.output 1 to n → Response time (0378–1 to n)
Prerequisite	One of the following options is selected in the **Assign current output** parameter (→ 🖹 110):

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow [*]
- Carrier mass flow [*]
- Density
- Reference density
- Concentration [*]
- Dynamic viscosity [*]
- Kinematic viscosity [*]
- Temp. compensated dynamic viscosity [*]
- Temp. compensated kinematic viscosity [*]
- Temperature
- Carrier pipe temperature [*]
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1 [*]
- Oscillation amplitude 0 [*]
- Oscillation amplitude 1 [*]
- Frequency fluctuation 0
- Frequency fluctuation 1 [*]
- Oscillation damping 0
- Oscillation damping 1 [*]
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1 [*]
- Signal asymmetry
- Exciter current 0
- Exciter current 1 [*]
- HBSI [*]

Detailed description of the options **Oscillation frequency, Oscillation amplitude, Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🖹 19)

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

One of the following options is selected in the **Current span** parameter (→ 🗎 111):
- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA

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

User interface	Positive floating-point number

Additional information   *Description*

ℹ️ The response time is made up of the time specified for the following dampings:
- Current output damping → 🗎 120
  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   One of the following options is selected in the **Assign current output** parameter
(→ 🗎 110):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *
- Density
- Reference density
- Concentration *
- Dynamic viscosity *
- Kinematic viscosity *
- Temp. compensated dynamic viscosity *
- Temp. compensated kinematic viscosity *
- Temperature
- Carrier pipe temperature *
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1 *
- Oscillation amplitude 0 *
- Oscillation amplitude 1 *
- Frequency fluctuation 0
- Frequency fluctuation 1 *
- Oscillation damping 0
- Oscillation damping 1 *
- Oscillation damping fluctuation 0

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*   Visibility depends on order options or device settings

- Oscillation damping fluctuation 1 *
- Signal asymmetry
- Exciter current 0
- Exciter current 1 *
- HBSI *

Detailed description of the options **Oscillation frequency, Oscillation amplitude, Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🗎 19)

One of the following options is selected in the **Current span** parameter (→ 🗎 111):
- 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 (→ 🗎 111).

"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 (→ 🗎 111).

"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 (→ 🗎 124).

---

* Visibility depends on order options or device settings

Failure current	⊞

Navigation	⊞⊟ Expert → Output → Curr.output 1 to n → Failure current (0352–1 to n)
Prerequisite	In the **Failure mode** parameter (→ ⊜ 122), the **Defined value** option is selected.
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 current 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

Measured current 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

▶ Pulse/frequency/switch output 1 to n		
	Terminal number (0492–1 to n)	→ ⊜ 126
	Signal mode (0490–1 to n)	→ ⊜ 126
	Operating mode (0469–1 to n)	→ ⊜ 127

Assign pulse output 1 to n (0460–1 to n)	→ 🖹 128
Value per pulse (0455–1 to n)	→ 🖹 129
Pulse width (0452–1 to n)	→ 🖹 129
Measuring mode (0457–1 to n)	→ 🖹 130
Failure mode (0480–1 to n)	→ 🖹 131
Pulse output 1 to n (0456–1 to n)	→ 🖹 132
Assign frequency output (0478–1 to n)	→ 🖹 132
Minimum frequency value (0453–1 to n)	→ 🖹 133
Maximum frequency value (0454–1 to n)	→ 🖹 134
Measuring value at minimum frequency (0476–1 to n)	→ 🖹 135
Measuring value at maximum frequency (0475–1 to n)	→ 🖹 136
Measuring mode (0479–1 to n)	→ 🖹 137
Damping output 1 to n (0477–1 to n)	→ 🖹 138
Response time (0491–1 to n)	→ 🖹 139
Failure mode (0451–1 to n)	→ 🖹 140
Failure frequency (0474–1 to n)	→ 🖹 141
Output frequency 1 to n (0471–1 to n)	→ 🖹 142
Switch output function (0481–1 to n)	→ 🖹 142
Assign diagnostic behavior (0482–1 to n)	→ 🖹 143
Assign limit (0483–1 to n)	→ 🖹 144
Switch-on value (0466–1 to n)	→ 🖹 146
Switch-off value (0464–1 to n)	→ 🖹 146

Assign flow direction check (0484–1 to n)	→ 🖺 147
Assign status (0485–1 to n)	→ 🖺 147
Switch-on delay (0467–1 to n)	→ 🖺 147
Switch-off delay (0465–1 to n)	→ 🖺 148
Failure mode (0486–1 to n)	→ 🖺 148
Switch status 1 to n (0461–1 to n)	→ 🖺 148
Invert output signal (0470–1 to n)	→ 🖺 149

Terminal number

Navigation 🔊🖵 Expert → Output → PFS output 1 to n → Terminal no. (0492–1 to n)

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

User interface
• Not used
• 24-25 (I/O 2)
• 22-23 (I/O 3)
• 20-21 (I/O 4) *

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

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* Visibility depends on order options or device settings

Operating mode	🔒

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

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

Selection • Pulse
• Frequency
• Switch

Factory setting Pulse

Additional information *"Pulse" option*

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

Example
• Flow rate approx. 100 g/s
• Pulse value 0.1 g
• Pulse width 0.05 ms
• Pulse rate 1 000 Impuls/s
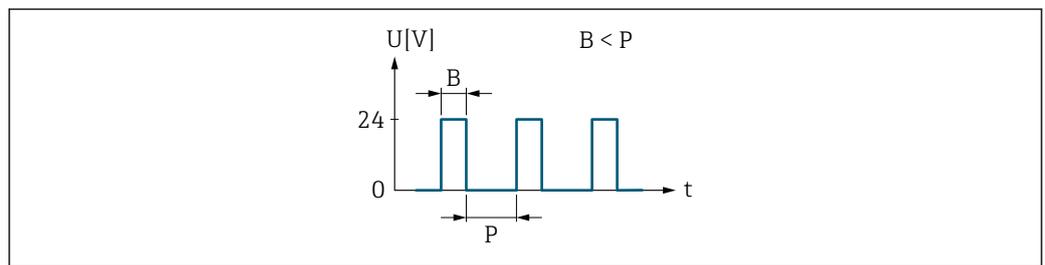
 🖼 *5   Quantity-proportional pulse (pulse value) with pulse width to be configured*

B   Pulse width entered
P   Pauses between the individual pulses

"Frequency" option

Flow-proportional frequency output with 1:1 on/off ratio
An output frequency is output that is proportional to the value of a process variable, such as mass flow, volume flow, corrected volume flow, target mass flow, carrier mass flow, density, reference density, concentration, dynamic viscosity, kinematic viscosity, temperature-compensated dynamic viscosity, temperature-compensated kinematic viscosity, temperature, carrier tube temperature, electronic temperature, vibration frequency, frequency fluctuation, oscillation amplitude, oscillation damping, oscillation damping fluctuation, signal asymmetry or excitation current.

Example
• Flow rate approx. 100 g/s
• Max. frequency 10 kHz
• Flow rate at max. frequency 1 000 g/s
• Output frequency approx. 1 000 Hz
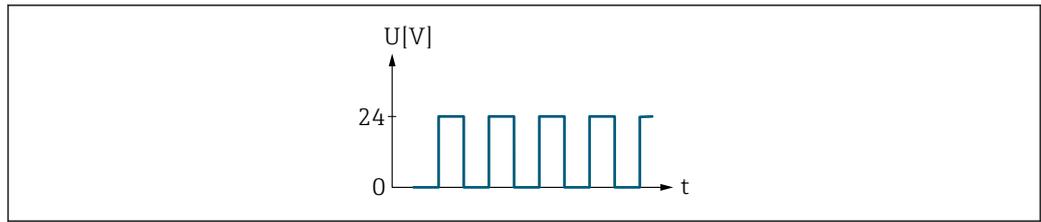
🖎 6   *Flow-proportional frequency output*

"Switch" option

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

Example
Alarm response without alarm
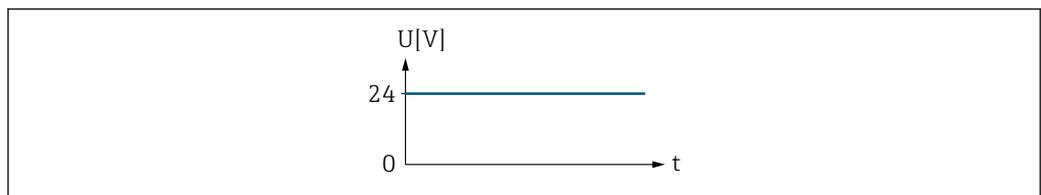
🖎 7   *No alarm, high level*

Example
Alarm response in case of alarm
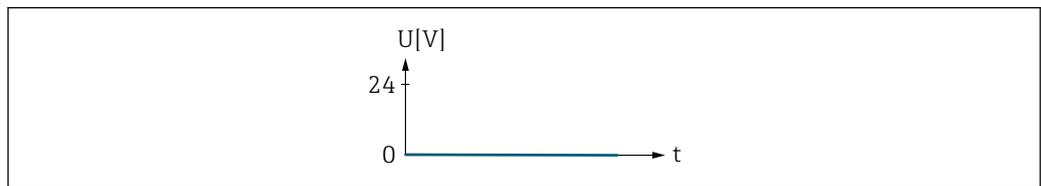
🖎 8   *Alarm, low level*

Assign pulse output 1 to n   🔒

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

Prerequisite   In the **Operating mode** parameter (→ 🕮 127), the **Pulse** option is selected.

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

Selection   • Off
                        • Mass flow
                        • Volume flow
                        • Corrected volume flow
                        • Target mass flow *
                        • Carrier mass flow *

Factory setting   Off

---

*   Visibility depends on order options or device settings

Value per pulse	🔒

Navigation	🔧🖥 Expert → Output → PFS output 1 to n → Value per pulse (0455–1 to n)
Prerequisite	In the **Operating mode** parameter (→ 🖥 127), the **Pulse** option is selected and one of the following options is selected in the **Assign pulse output** parameter (→ 🖥 128): • Mass flow • Volume flow • Corrected volume flow • Target mass flow * • Carrier mass flow *
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 → 🖥 230
Additional information	*User entry* Weighting of the pulse output with a quantity. The lower the pulse value, the • better the resolution. • the higher the frequency of the pulse response.

Pulse width	🔒

Navigation	🔧🖥 Expert → Output → PFS output 1 to n → Pulse width (0452–1 to n)
Prerequisite	In the **Operating mode** parameter (→ 🖥 127), the **Pulse** option is selected and one of the following options is selected in the **Assign pulse output** parameter (→ 🖥 128): • Mass flow • Volume flow • Corrected volume flow • Target mass flow * • Carrier mass flow *
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**.

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* Visibility depends on order options or device settings
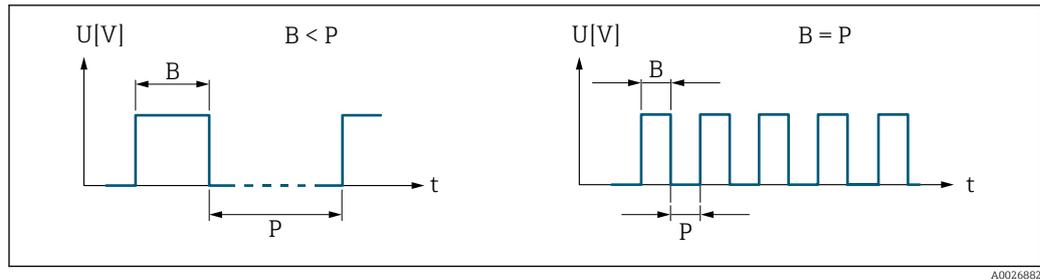
B   Pulse width entered
P   Pauses between the individual pulses

Example

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

Measuring mode	🔒

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

Prerequisite   In the **Operating mode** parameter (→ 🕮 127), the **Pulse** option is selected and one of the
                          following options is selected in the **Assign pulse output** parameter (→ 🕮 128):
                          - Mass flow
                          - Volume flow
                          - Corrected volume flow
                          - Target mass flow *
                          - Carrier mass flow *

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

Selection   - Forward flow
                          - Forward/Reverse flow
                          - Reverse flow
                          - Reverse flow compensation

Factory setting   Forward flow

---

*   Visibility depends on order options or device settings

Additional information	*Selection*
	• Forward flow Positive flow is output, negative flow is not output. • Forward/Reverse flow 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. • Reverse flow compensation 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 (→ 🖺 115)

Examples

For a detailed description of the configuration examples, see the **Measuring mode** parameter (→ 🖺 115)

Failure mode   🔒

Navigation	🔘🔲 Expert → Output → PFS output 1 to n → Failure mode (0480–1 to n)
Prerequisite	In the **Operating mode** parameter (→ 🖺 127), the **Pulse** option is selected and one of the following options is selected in the **Assign pulse output** parameter (→ 🖺 128): • Mass flow • Volume flow • Corrected volume flow • Target mass flow [*] • Carrier mass flow [*]
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

---

* Visibility depends on order options or device settings

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	In the **Operating mode** parameter (→ 🗎 127), the **Pulse** option is selected.
Description	Displays the pulse frequency currently output.
User interface	Positive floating-point number
Additional information	*Description*

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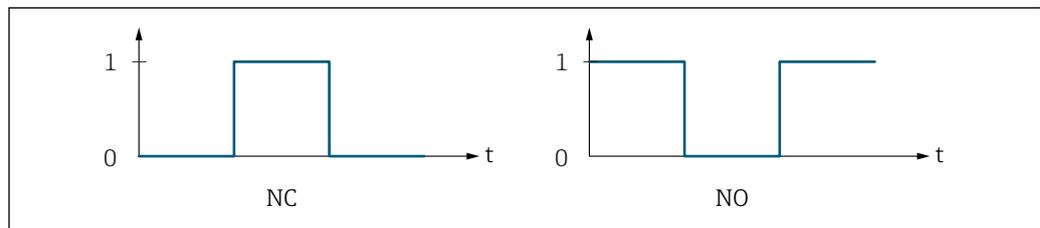
0   Non-conductive
1   Conductive
NC   NC contact (normally closed)
NO   NO contact (normally open)

The output behavior can be reversed via the **Invert output signal** parameter (→ 🗎 149) 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 (→ 🗎 131)) can be configured.

Assign frequency output   🔒

Navigation	🔘🖥 Expert → Output → PFS output 1 to n → Assign freq. (0478–1 to n)
Prerequisite	In the **Operating mode** parameter (→ 🗎 127), the **Frequency** option is selected.
Description	Use this function to select the process variable for the frequency output.

> ℹ️ Detailed description of the options **Oscillation frequency, Oscillation amplitude, Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🗎 19)

Selection	• Off
	• Mass flow
	• Volume flow
	• Corrected volume flow

- Target mass flow [*]
- Carrier mass flow [*]
- Density
- Reference density
- Concentration [*]
- Dynamic viscosity [*]
- Kinematic viscosity [*]
- Temp. compensated dynamic viscosity [*]
- Temp. compensated kinematic viscosity [*]
- Temperature
- Carrier pipe temperature [*]
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1 [*]
- Oscillation amplitude 0 [*]
- Oscillation amplitude 1 [*]
- Frequency fluctuation 0
- Frequency fluctuation 1 [*]
- Oscillation damping 0
- Oscillation damping 1 [*]
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1 [*]
- Signal asymmetry
- Exciter current 0
- Exciter current 1 [*]

Factory setting	Off

Minimum frequency value	🔒

Navigation	🖩🖳 Expert → Output → PFS output 1 to n → Min. freq. value (0453–1 to n)
Prerequisite	In the **Operating mode** parameter (→ 🖺 127), the **Frequency** option is selected and one of the following options is selected in the **Assign frequency output** parameter (→ 🖺 132): - Mass flow - Volume flow - Corrected volume flow - Target mass flow [*] - Carrier mass flow [*] - Density - Reference density - Concentration [*] - Dynamic viscosity [*] - Kinematic viscosity [*] - Temp. compensated dynamic viscosity [*] - Temp. compensated kinematic viscosity [*] - Temperature - Carrier pipe temperature [*] - Electronic temperature - Oscillation frequency 0 - Oscillation frequency 1 [*] - Frequency fluctuation 0

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* Visibility depends on order options or device settings

- Frequency fluctuation 1 *
- Oscillation amplitude 0 *
- Oscillation amplitude 1 *
- Oscillation damping 0
- Oscillation damping 1 *
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1 *
- Signal asymmetry
- Exciter current 0
- Exciter current 1 *

Detailed description of the options **Oscillation frequency, Oscillation amplitude, Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🖺 19)

Description	Use this function to enter the start value frequency.
User entry	0.0 to 10000.0 Hz
Factory setting	0.0 Hz

Maximum frequency value	🔒

Navigation	😨🖳 Expert → Output → PFS output 1 to n → Max. freq. value (0454–1 to n)
Prerequisite	In the **Operating mode** parameter (→ 🖺 127), the **Frequency** option is selected and one of the following options is selected in the **Assign frequency output** parameter (→ 🖺 132): • Mass flow • Volume flow • Corrected volume flow • Target mass flow * • Carrier mass flow * • Density • Reference density • Concentration * • Dynamic viscosity * • Kinematic viscosity * • Temp. compensated dynamic viscosity * • Temp. compensated kinematic viscosity * • Temperature • Carrier pipe temperature * • Electronic temperature • Oscillation frequency 0 • Oscillation frequency 1 * • Frequency fluctuation 0 • Frequency fluctuation 1 * • Oscillation amplitude 0 * • Oscillation amplitude 1 * • Oscillation damping 0 • Oscillation damping 1 * • Oscillation damping fluctuation 0 • Oscillation damping fluctuation 1 *

---

* Visibility depends on order options or device settings

- Signal asymmetry
- Exciter current 0
- Exciter current 1 *

ℹ️ Detailed description of the options **Oscillation frequency, Oscillation amplitude, Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🖻 19)

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

Measuring value at minimum frequency   🔒

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

Prerequisite   In the **Operating mode** parameter (→ 🖻 127), the **Frequency** option is selected and one of the following options is selected in the **Assign frequency output** parameter (→ 🖻 132):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *
- Density
- Reference density
- Concentration *
- Dynamic viscosity *
- Kinematic viscosity *
- Temp. compensated dynamic viscosity *
- Temp. compensated kinematic viscosity *
- Temperature
- Carrier pipe temperature *
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1 *
- Frequency fluctuation 0
- Frequency fluctuation 1 *
- Oscillation amplitude 0 *
- Oscillation amplitude 1 *
- Oscillation damping 0
- Oscillation damping 1 *
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1 *
- Signal asymmetry
- Exciter current 0
- Exciter current 1 *

ℹ️ Detailed description of the options **Oscillation frequency, Oscillation amplitude, Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🖻 19)

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

---

* Visibility depends on order options or device settings

User entry	Signed floating-point number
Factory setting	Depends on country and nominal diameter
Additional information	*Dependency*

The entry depends on the process variable selected in the **Assign frequency output** parameter (→ 🖺 132).

Measuring value at maximum frequency   🔒

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

Prerequisite   In the **Operating mode** parameter (→ 🖺 127), the **Frequency** option is selected and one of the following options is selected in the **Assign frequency output** parameter (→ 🖺 132):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow *
- Carrier mass flow *
- Density
- Reference density
- Concentration *
- Dynamic viscosity *
- Kinematic viscosity *
- Temp. compensated dynamic viscosity *
- Temp. compensated kinematic viscosity *
- Temperature
- Carrier pipe temperature *
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1 *
- Frequency fluctuation 0
- Frequency fluctuation 1 *
- Oscillation amplitude 0 *
- Oscillation amplitude 1 *
- Oscillation damping 0
- Oscillation damping 1 *
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1 *
- Signal asymmetry
- Exciter current 0
- Exciter current 1 *

Detailed description of the options **Oscillation frequency, Oscillation amplitude, Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🖺 19)

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

---

* Visibility depends on order options or device settings

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 frequency output** parameter (→ 🖺 132).

Measuring mode	🔒

Navigation   🔘🔲 Expert → Output → PFS output 1 to n → Measuring mode (0479–1 to n)

Prerequisite   In the **Operating mode** parameter (→ 🖺 127), the **Frequency** option is selected and one of the following options is selected in the **Assign frequency output** parameter (→ 🖺 132):
• Mass flow
• Volume flow
• Corrected volume flow
• Target mass flow *
• Carrier mass flow *
• Density
• Reference density
• Concentration *
• Dynamic viscosity *
• Kinematic viscosity *
• Temp. compensated dynamic viscosity *
• Temp. compensated kinematic viscosity *
• Temperature
• Carrier pipe temperature *
• Electronic temperature
• Oscillation frequency 0
• Oscillation frequency 1 *
• Frequency fluctuation 0
• Frequency fluctuation 1 *
• Oscillation amplitude 0 *
• Oscillation amplitude 1 *
• Oscillation damping 0
• Oscillation damping 1 *
• Oscillation damping fluctuation 0
• Oscillation damping fluctuation 1 *
• Signal asymmetry
• Exciter current 0
• Exciter current 1 *

Detailed description of the options **Oscillation frequency, Oscillation amplitude, Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🖺 19)

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

Selection   • Forward flow
• Forward/Reverse flow
• Reverse flow compensation

---

* Visibility depends on order options or device settings

Factory setting   Forward flow

Additional information   *Selection*

🛈 For a detailed description of the options available, see the **Measuring mode**
     parameter (→ 🗐 115)

Examples

🛈 For a detailed description of the configuration examples, see the **Measuring mode**
     parameter (→ 🗐 115)

Damping output 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 (→ 🗐 127), the **Frequency** option is selected and one
                         of the following options is selected in the **Assign frequency output** parameter
                         (→ 🗐 132):
                         • Mass flow
                         • Volume flow
                         • Corrected volume flow
                         • Target mass flow *
                         • Carrier mass flow *
                         • Density
                         • Reference density
                         • Concentration *
                         • Dynamic viscosity *
                         • Kinematic viscosity *
                         • Temp. compensated dynamic viscosity *
                         • Temp. compensated kinematic viscosity *
                         • Temperature
                         • Carrier pipe temperature *
                         • Electronic temperature
                         • Oscillation frequency 0
                         • Oscillation frequency 1 *
                         • Frequency fluctuation 0
                         • Frequency fluctuation 1 *
                         • Oscillation amplitude 0 *
                         • Oscillation amplitude 1 *
                         • Oscillation damping 0
                         • Oscillation damping 1 *
                         • Oscillation damping fluctuation 0
                         • Oscillation damping fluctuation 1 *
                         • Signal asymmetry
                         • Exciter current 0
                         • Exciter current 1 *

                         🛈 Detailed description of the options **Oscillation frequency, Oscillation amplitude,
                             Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🗐 19)

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

---

* Visibility depends on order options or device settings

User entry	0 to 999.9 s

Factory setting	0.0 s

Additional information	*User entry*

Use this function to enter a time constant (PT1 element [6]) 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.

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

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

Response time

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

Prerequisite	In the **Operating mode** parameter (→ 🗎 127), the **Frequency** option is selected and one of the following options is selected in the **Assign frequency output** parameter (→ 🗎 132):

• Mass flow
• Volume flow
• Corrected volume flow
• Target mass flow [*]
• Carrier mass flow [*]
• Density
• Reference density
• Concentration [*]
• Dynamic viscosity [*]
• Kinematic viscosity [*]
• Temp. compensated dynamic viscosity [*]
• Temp. compensated kinematic viscosity [*]
• Temperature
• Carrier pipe temperature [*]
• Electronic temperature
• Oscillation frequency 0
• Oscillation frequency 1 [*]
• Frequency fluctuation 0
• Frequency fluctuation 1 [*]
• Oscillation amplitude 0 [*]
• Oscillation amplitude 1 [*]
• Oscillation damping 0
• Oscillation damping 1 [*]
• Oscillation damping fluctuation 0
• Oscillation damping fluctuation 1 [*]

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

- Signal asymmetry
- Exciter current 0
- Exciter current 1 [*]

ℹ️ Detailed description of the options **Oscillation frequency, Oscillation amplitude, Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🖺 19)

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*

ℹ️ The response time is made up of the time specified for the following dampings:
- Damping of pulse/frequency/switch output → 🖺 120
  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	In the **Operating mode** parameter (→ 🖺 127), the **Frequency** option is selected and one of the following options is selected in the **Assign frequency output** parameter (→ 🖺 132):

- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow [*]
- Carrier mass flow [*]
- Density
- Reference density
- Concentration [*]
- Dynamic viscosity [*]
- Kinematic viscosity [*]
- Temp. compensated dynamic viscosity [*]
- Temp. compensated kinematic viscosity [*]
- Temperature
- Carrier pipe temperature [*]
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1 [*]
- Frequency fluctuation 0
- Frequency fluctuation 1 [*]
- Oscillation amplitude 0 [*]
- Oscillation amplitude 1 [*]
- Oscillation damping 0

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[*]   Visibility depends on order options or device settings

	• Oscillation damping 1 * • Oscillation damping fluctuation 0 • Oscillation damping fluctuation 1 * • Signal asymmetry • Exciter current 0 • Exciter current 1 *

ℹ️ Detailed description of the options **Oscillation frequency, Oscillation amplitude, Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🖺 19)

Description	Use this function to select the failure mode of the frequency output in the event of a device alarm.
Selection	• Actual value • Defined value • 0 Hz
Factory setting	0 Hz
Additional information	*Selection* • Actual value In the event of a device alarm, the frequency output continues on the basis of the current flow measurement. The device alarm is ignored. • Defined value In the event of a device alarm, the frequency output continues on the basis of a predefined value. The Failure frequency (→ 🖺 141) replaces the current measured value, making it possible to bypass the device alarm. The actual measurement is switched off for the duration of the device alarm. • 0 Hz In the event of a device alarm, the frequency output is "switched off". **NOTICE!** A device alarm is a measuring device error that must be taken seriously. It can affect the measurement quality such that the quality can no longer be guaranteed. The **Actual value** option is only recommended if it can be guaranteed that all possible alarm conditions will not affect the measurement quality.

Failure frequency	🔒

Navigation	🆀🖳 Expert → Output → PFS output 1 to n → Failure freq. (0474–1 to n)
Prerequisite	In the **Operating mode** parameter (→ 🖺 127), the **Frequency** option is selected and one of the following options is selected in the **Assign frequency output** parameter (→ 🖺 132): • Mass flow • Volume flow • Corrected volume flow • Target mass flow * • Carrier mass flow * • Density • Reference density • Concentration * • Dynamic viscosity * • Kinematic viscosity *

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*   Visibility depends on order options or device settings

- Temp. compensated dynamic viscosity [*]
- Temp. compensated kinematic viscosity [*]
- Temperature
- Carrier pipe temperature [*]
- Electronic temperature
- Oscillation frequency 0
- Oscillation frequency 1 [*]
- Frequency fluctuation 0
- Frequency fluctuation 1 [*]
- Oscillation amplitude 0 [*]
- Oscillation amplitude 1 [*]
- Oscillation damping 0
- Oscillation damping 1 [*]
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1 [*]
- Signal asymmetry
- Exciter current 0
- Exciter current 1 [*]

Detailed description of the options **Oscillation frequency, Oscillation amplitude, Oscillation damping** and **Signal asymmetry**: **Value 1 display** parameter (→ 🖺 19)

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 frequency 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 (→ 🖺 127), 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 output function　　　　　　　　　　　　　　　　　　　　　　　　　　　　　🔒

Navigation	🔘🔲 Expert → Output → PFS output 1 to n → Switch out funct (0481–1 to n)
Prerequisite	In the **Operating mode** parameter (→ 🖺 127) the **Switch** option is selected.
Description	Use this function to select a function for the switch output.

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* Visibility depends on order options or device settings

Selection	• Off • On • Diagnostic behavior • Limit • Flow direction 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).
• Diagnostic 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.
• Flow direction 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 diagnostic behavior   🔒

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

Prerequisite	• In the **Operating mode** parameter (→ 🔲 127), the **Switch** option is selected. • In the **Switch output function** parameter (→ 🔲 142), the **Diagnostic 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*

                           ℹ 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   • In the **Operating mode** parameter (→ 🖺 127), the **Switch** option is selected.
                           • In the **Switch output function** parameter (→ 🖺 142), the **Limit** option is selected.

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

Selection   • Mass flow
                           • Volume flow
                           • Corrected volume flow
                           • Target mass flow *
                           • Carrier mass flow *
                           • Density
                           • Reference density
                           • Dynamic viscosity *
                           • Concentration *
                           • Kinematic viscosity *
                           • Temp. compensated dynamic viscosity *
                           • Temp. compensated kinematic viscosity *
                           • Temperature
                           • Totalizer 1
                           • Totalizer 2
                           • Totalizer 3
                           • Oscillation damping

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

---

*   Visibility depends on order options or device settings

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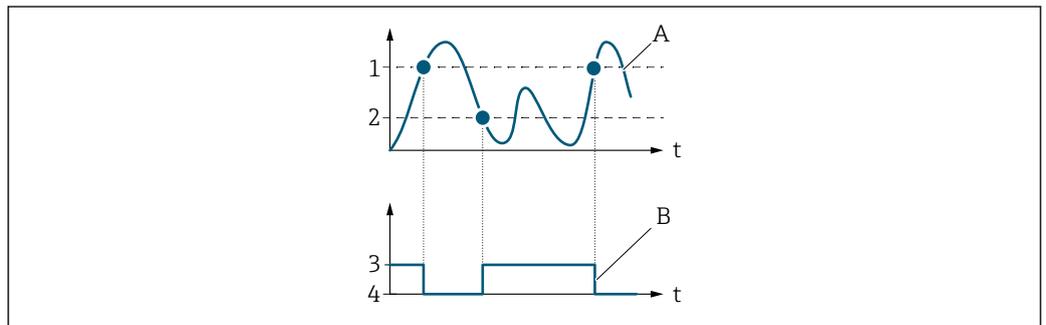
1   Switch-off value
2   Switch-on value
3   Conductive
4   Non-conductive
A   Process variable
B   Status output

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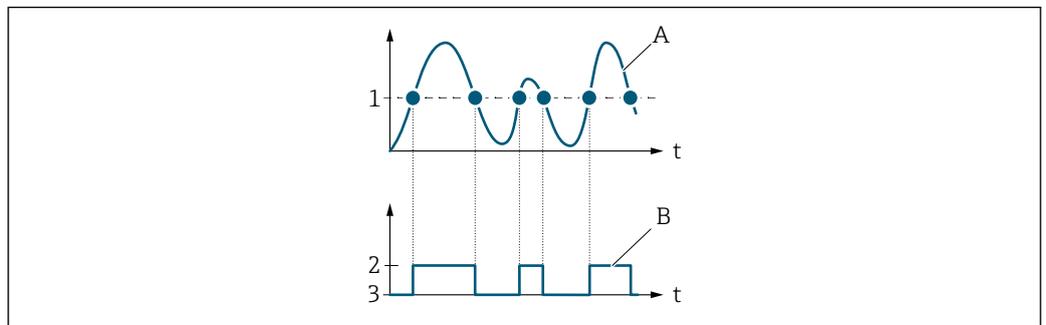
1   Switch-on value = Switch-off value
2   Conductive
3   Non-conductive
A   Process variable
B   Status output

Switch-on value	🔒

Navigation	〓〓 Expert → Output → PFS output 1 to n → Switch-on value (0466–1 to n)
Prerequisite	• In the **Operating mode** parameter (→ 🖹 127), the **Switch** option is selected. • In the **Switch output function** parameter (→ 🖹 142), 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). ℹ️ When using a hysteresis: Switch-on value > Switch-off value. *Dependency* ℹ️ The unit depends on the process variable selected in the **Assign limit** parameter (→ 🖹 144).

Switch-off value	🔒

Navigation	〓〓 Expert → Output → PFS output 1 to n → Switch-off value (0464–1 to n)
Prerequisite	• In the **Operating mode** parameter (→ 🖹 127), the **Switch** option is selected. • In the **Switch output function** parameter (→ 🖹 142), 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	*Description* Use this function to enter the limit value for the switch-off value (process variable < switch-off value = open, non-conductive). ℹ️ When using a hysteresis: Switch-on value > Switch-off value. *Dependency* ℹ️ The unit depends on the process variable selected in the **Assign limit** parameter (→ 🖹 144).

Assign flow direction check	🔒

Navigation	🎛🖥 Expert → Output → PFS output 1 to n → Assign dir.check (0484–1 to n)
Prerequisite	• The **Switch** option is selected in the **Operating mode** parameter (→ 🖥 127). • The **Flow direction check** option is selected in the **Switch output function** parameter (→ 🖥 142).
Description	Use this function to select a process variable for monitoring the flow direction.
Selection	• Off • Volume flow • Mass flow • Corrected volume flow
Factory setting	Mass flow

Assign status	🔒

Navigation	🎛🖥 Expert → Output → PFS output 1 to n → Assign status (0485–1 to n)
Prerequisite	• The **Switch** option is selected in the **Operating mode** parameter (→ 🖥 127). • The **Status** option is selected in the **Switch output function** parameter (→ 🖥 142).
Description	Use this function to select a device status for the switch output.
Selection	• Partially filled pipe detection • Low flow cut off
Factory setting	Partially filled pipe detection
Additional information	*Options* If empty pipe detection or low flow cut off are enabled, the output is conductive. Otherwise, the switch output is non-conductive.

Switch-on delay	🔒

Navigation	🎛🖥 Expert → Output → PFS output 1 to n → Switch-on delay (0467–1 to n)
Prerequisite	• The **Switch** option is selected in the **Operating mode** parameter (→ 🖥 127). • The **Limit** option is selected in the **Switch output function** parameter (→ 🖥 142).
Description	Use this function to enter a delay time for switching on the switch output.
User entry	0.0 to 100.0 s
Factory setting	0.0 s

Switch-off delay

Navigation	🔧🖥 Expert → Output → PFS output 1 to n → Switch-off delay (0465–1 to n)
Prerequisite	• The Switch option is selected in the Operating mode parameter (→ 🖐 127). • The Limit option is selected in the Switch output function parameter (→ 🖐 142).
Description	Use this function to enter a delay time for switching off the switch output.
User entry	0.0 to 100.0 s
Factory setting	0.0 s

Failure mode

Navigation	🔧🖥 Expert → Output → PFS output 1 to n → Failure mode (0486–1 to n)
Description	Use this function to select a failsafe mode for the switch output in the event of a device alarm.
Selection	• Actual status • Open • Closed
Factory setting	Open
Additional information	*Options* • Actual status In the event of a device alarm, faults are ignored and the current behavior of the input value is output by the switch output. The **Actual status** option behaves in the same way as the current input value. • Open In the event of a device alarm, the switch output's transistor is set to **non-conductive**. • Closed In the event of a device alarm, the switch output's transistor is set to **conductive**.

Switch status 1 to n

Navigation	🔧🖥 Expert → Output → PFS output 1 to n → Switch status 1 to n (0461–1 to n)
Prerequisite	The Switch option is selected in the Operating mode parameter (→ 🖐 127).
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 output signal	🔒

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*
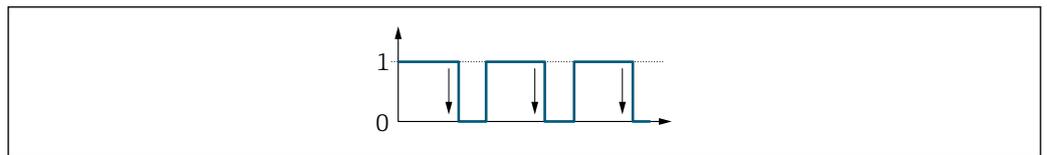
No option (passive - negative)

Yes option (passive - positive)
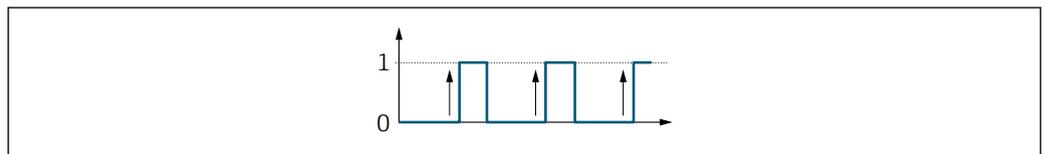
3.5.3 "Relay output 1 to n" submenu

Navigation   🔘🖥 Expert → Output → Relay output 1 to n

▶ Relay output 1 to n	
Terminal number	→ 🖪 150
Relay output function	→ 🖪 150
Assign flow direction check	→ 🖪 151

Assign limit	→ 🖺 151
Assign diagnostic behavior	→ 🖺 152
Assign status	→ 🖺 153
Switch-off value	→ 🖺 153
Switch-off delay	→ 🖺 153
Switch-on value	→ 🖺 154
Switch-on delay	→ 🖺 154
Failure mode	→ 🖺 154
Switch status	→ 🖺 155
Actual relay state	→ 🖺 155

Terminal number

Navigation	🖩🖳 Expert → Output → Relay output 1 to n → Terminal no. (0812–1 to n)
Description	Displays the terminal numbers used by the relay output module.
User interface	• Not used • 24-25 (I/O 2) • 22-23 (I/O 3) • 20-21 (I/O 4)
Additional information	*"Not used" option* The relay output module does not use any terminal numbers.

Relay output function   🖫

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 • Diagnostic behavior • Limit • Flow direction 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).
• Diagnostic 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.
• Flow direction 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 flow direction check	🔒

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

Prerequisite   In the **Relay output function** parameter (→ 📄 150), the **Flow direction check** option is
                        selected.

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

Selection   • Off
                        • Volume flow
                        • Mass flow
                        • Corrected volume flow

Factory setting   Mass flow

Assign limit	🔒

Navigation   🖥🖳 Expert → Output → Relay output 1 to n → Assign limit (0807–1 to n)

Prerequisite   In the **Relay output function** parameter (→ 📄 150), the **Limit** option is selected.

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

Selection   • Mass flow
                        • Volume flow
                        • Corrected volume flow
                        • Target mass flow *

---

* Visibility depends on order options or device settings

- Carrier mass flow [*]
- Density
- Reference density
- Dynamic viscosity [*]
- Concentration [*]
- Kinematic viscosity [*]
- Temp. compensated dynamic viscosity [*]
- Temp. compensated kinematic viscosity [*]
- Temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Oscillation damping

Factory setting   Mass flow

Assign diagnostic behavior	🔒

Navigation	🔲🔳 Expert → Output → Relay output 1 to n → Assign diag. beh (0806–1 to n)
Prerequisite	In the **Relay output function** parameter (→ 📄 150), the **Diagnostic 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*

Description

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

Selection

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

---

* Visibility depends on order options or device settings

Assign status	🔒

Navigation	🔘🖳 Expert → Output → Relay output 1 to n → Assign status (0805–1 to n)
Prerequisite	In the **Relay output function** parameter (→ 🗎 150), the **Digital Output** option is selected.
Description	Use this function to select the device status for the relay output.
Selection	• Partially filled pipe detection • Low flow cut off
Factory setting	Partially filled pipe detection

Switch-off value	🔒

Navigation	🔘🖳 Expert → Output → Relay output 1 to n → Switch-off value (0809–1 to n)
Prerequisite	In the **Relay output function** parameter (→ 🗎 150), 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	*Description* Use this function to enter the limit value for the switch-off value (process variable < switch-off value = open, non-conductive). ℹ️ When using a hysteresis: Switch-on value > Switch-off value. *Dependency* ℹ️ The unit is dependent on the process variable selected in the **Assign limit** parameter (→ 🗎 151).

Switch-off delay	🔒

Navigation	🔘🖳 Expert → Output → Relay output 1 to n → Switch-off delay (0813–1 to n)
Prerequisite	In the **Relay output function** parameter (→ 🗎 150), 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 output function** parameter (→ 📖 150), 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). ℹ️ When using a hysteresis: Switch-on value > Switch-off value. *Dependency* ℹ️ The unit is dependent on the process variable selected in the **Assign limit** parameter (→ 📖 151).

Switch-on delay   🔒

Navigation	�🖩 Expert → Output → Relay output 1 to n → Switch-on delay (0814–1 to n)
Prerequisite	In the **Relay output function** parameter (→ 📖 150), 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.

Actual relay state   🔒

Navigation	🖦🖳 Expert → Output → Relay output 1 to n → Act. relay state (0816–1 to n)

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

Selection	• Open • Closed

Factory setting	Open

Additional information   *Selection*

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

3.5.4   "Double pulse output" submenu

Navigation   �◳◰ Expert → Output → Double pulse out

▸ Double pulse output	
Master terminal number (0981)	→ 🗎 156
Slave terminal number (0990)	→ 🗎 156
Signal mode (0991)	→ 🗎 157
Assign pulse output 1 (0982–1)	→ 🗎 157
Value per pulse (0983)	→ 🗎 157
Pulse width (0986)	→ 🗎 158
Phase shift (0992)	→ 🗎 158
Measuring mode (0984)	→ 🗎 158
Failure mode (0985)	→ 🗎 159
Pulse output (0987)	→ 🗎 160
Invert output signal (0993)	→ 🗎 160

Master terminal number

Navigation   ◳◰ Expert → Output → Double pulse out → Master term. no. (0981)

Description Displays the master terminal number for the double pulse output.

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

Additional information *"Not used" option*

The double pulse output does not use any terminal numbers.

Slave terminal number

Navigation   ◳◰ Expert → Output → Double pulse out → Slave term. no. (0990)

Description Displays the slave terminal number for the double pulse output.

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

Additional information	*"Not used" option*

The double pulse output does not use any terminal numbers.

Signal mode 🔒

Navigation	🔘🖥 Expert → Output → Double pulse out → Signal mode (0991)

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

Selection	• Passive • Active • Passive NAMUR

Factory setting	Passive

Assign pulse output 1 🔒

Navigation	🔘🖥 Expert → Output → Double pulse out → Assign pulse 1 (0982–1)

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

Selection	• Off • Mass flow • Volume flow • Corrected volume flow • Target mass flow * • Carrier mass flow *

Factory setting	Off

Value per pulse 🔒

Navigation	🔘🖥 Expert → Output → Double pulse out → Value per pulse (0983)

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 → 🖺 230

---

*   Visibility depends on order options or device settings

Additional information   *User entry*

                                Weighting of the pulse output with a quantity.

                                The lower the pulse value, the
                                • better the resolution.
                                • the higher the frequency of the pulse response.

Pulse width   🔒

Navigation   🖴🖳 Expert → Output → Double pulse out → Pulse width (0986)

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

User entry   0.5 to 2 000 ms

Factory setting   0.5 ms

Additional information   ℹ️ For a detailed description and example: **Pulse width** parameter (→ 🖺 129)

Phase shift   🔒

Navigation   🖴🖳 Expert → Output → Double pulse out → Phase shift (0992)

Description   Use this function to select the degree of phase shift.

Selection   • 90°
                                • 180°

Factory setting   90°

Additional information   *Selection*

                                • 90°
                                  Phase shift by a quarter period.
                                • 180°
                                  Phase shift by a half period, which is equivalent to a phase reversal.

Measuring mode   🔒

Navigation   🖴🖳 Expert → Output → Double pulse out → Measuring mode (0984)

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

Selection   • Forward flow
                                • Forward/Reverse flow
                                • Reverse flow
                                • Reverse flow compensation

Factory setting   Forward flow

Additional information   *Selection*

• Forward flow
Positive flow is output, negative flow is not output.
• Forward/Reverse flow
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.
• Reverse flow compensation
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 (→ 🖺 115)

Examples

For a detailed description of the configuration examples, see the **Measuring mode**
parameter (→ 🖺 115)

Failure mode	🔒

Navigation   🖴🖳 Expert → Output → Double pulse out → Failure mode (0985)

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

Selection

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

Navigation   ⓘ⊞ Expert → Output → Double pulse out → Pulse output (0987)

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

User interface   Positive floating-point number

Additional information   ℹ️ For a detailed description and example: **Pulse output** parameter (→ 🖺 132)

Invert output signal

Navigation   ⓘ⊞ Expert → Output → Double pulse out → Invert outp.sig. (0993)

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

Selection   • No
                            • Yes

Factory setting   No

Additional information   *Selection*

No option (passive - negative)

Yes option (passive - positive)

3.6   "Communication" submenu

Navigation   ⊟   Expert → Communication

▸ **Communication**

  ▸ **Modbus configuration**   → 🖺 161
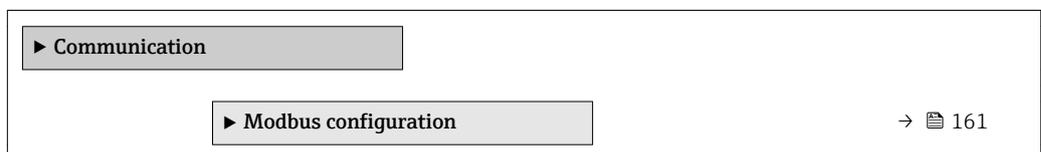
‣ Modbus information	→ 🗎 165
‣ Modbus data map	→ 🗎 166
‣ Web server	→ 🗎 166
‣ WLAN settings	→ 🗎 169

3.6.1 "Modbus configuration" submenu

Navigation   🖳   Expert → Communication → Modbus config.

‣ Modbus configuration	
Bus address (7112)	→ 🗎 161
Baudrate (7111)	→ 🗎 162
Data transfer mode (7115)	→ 🗎 162
Parity (7122)	→ 🗎 162
Byte order (7113)	→ 🗎 163
Telegram delay (7146)	→ 🗎 163
Failure mode (7116)	→ 🗎 163
Bus termination (7155)	→ 🗎 164
Fieldbus writing access (7156)	→ 🗎 164

Bus address   🔒

Navigation   🖳🖳   Expert → Communication → Modbus config. → Bus address (7112)

Description   For entering the device address.

User entry   1 to 247

Factory setting   247

Baudrate

| Navigation | Expert → Communication → Modbus config. → Baudrate (7111) |

| Description | Use this function to select a transmission rate. |

Selection
- 1200 BAUD
- 2400 BAUD
- 4800 BAUD
- 9600 BAUD
- 19200 BAUD
- 38400 BAUD
- 57600 BAUD
- 115200 BAUD

Factory setting   19200 BAUD

Data transfer mode

| Navigation | Expert → Communication → Modbus config. → Data trans. mode (7115) |

| Description | Use this function to select the data transmission mode. |

Selection
- ASCII
- RTU

Factory setting   RTU

Additional information   *Options*

- ASCII
  Transmission of data in the form of readable ASCII characters. Error protection via LRC.
- RTU
  Transmission of data in binary form. Error protection via CRC16.

Parity

| Navigation | Expert → Communication → Modbus config. → Parity (7122) |

| Description | Use this function to select the parity bit. |

Selection
- Odd
- Even
- None / 1 stop bit
- None / 2 stop bits

Factory setting   Even

Additional information   *Options*

Picklist **ASCII** option:
- 0 = **Even** option
- 1 = **Odd** option

Picklist **RTU** option:
- 0 = **Even** option
- 1 = **Odd** option
- 2 = **None / 1 stop bit** option
- 3 = **None / 2 stop bits** option

Byte order   🔒

Navigation	🖩🖥 Expert → Communication → Modbus config. → Byte order (7113)
Description	Use this function to select the sequence in which the bytes are transmitted. The transmission sequence must be coordinated with the Modbus master.
Selection	▪ 0-1-2-3 ▪ 3-2-1-0 ▪ 1-0-3-2 ▪ 2-3-0-1
Factory setting	1-0-3-2

Telegram delay   🔒

Navigation	🖩🖥 Expert → Communication → Modbus config. → Telegram delay (7146)
Description	Use this function to enter a delay time after which the measuring device replies to the request telegram of the Modbus master. This allows communication to be adapted to slow Modbus RS485 masters.
User entry	0 to 100 ms
Factory setting	6 ms

Failure mode   🔒

Navigation	🖩🖥 Expert → Communication → Modbus config. → Failure mode (7116)
Description	Use this function to select the measured value output in the event of a diagnostic message via Modbus communication.
Selection	▪ NaN value ▪ Last valid value

Factory setting	NaN value

Additional information	*Options*

- NaN value
  The device outputs the NaN value [7].
- Last valid value
  The device outputs the last valid measured value before the fault occurred.

This effect of this parameter depends on the option selected in the **Assign diagnostic behavior** parameter.

Bus termination

Navigation	Expert → Communication → Modbus config. → Bus termination (7155)

Description	Displays whether the terminating resistor is enabled or disabled.

User interface	• Off • On

Factory setting	Off

Additional information	*Selection*

- Off
  The terminating resistor is disabled.
- On
  The terminating resistor is enabled.

For detailed information about enabling the terminating resistor, see the Operating Instructions for the device, "Enabling the terminating resistor" section→ 🖺 8

Fieldbus writing access

Navigation	Expert → Communication → Modbus config. → Fieldb.writ.acc. (7156)

Description	Use this function to restrict access to the measuring device via fieldbus (Modbus protocol).

Selection	• Read + write • Read only

Factory setting	Read + write

---

7)   Not a Number

Additional information　　*Description*

If read and/or write protection is enabled, the parameter can only be controlled and reset via local operation. Access is no longer possible via operating tools.

This does not affect cyclic measured value transmission to the higher-order system, which is always guaranteed.

Selection

- Read + write
  The parameters are read and write parameters.
- Read only
- The parameters are read only parameters.

3.6.2　　"Modbus information" submenu

Navigation　　　　　　🖥　　Expert → Communication → Modbus info

```
▶ Modbus information

              Device ID (7153)                              → 🖹 165

              Device revision (7154)                        → 🖹 165
```
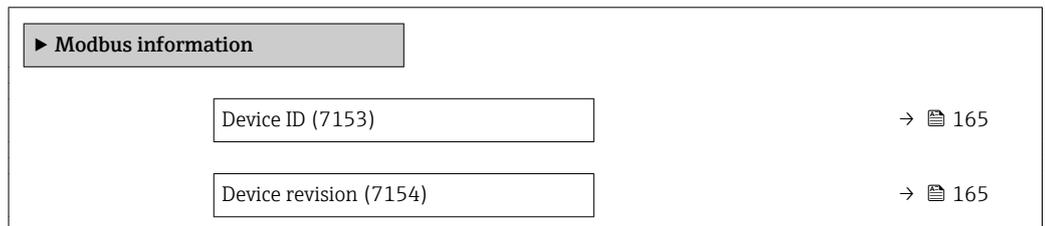
Device ID

Navigation　　　　　　🖥🖥　Expert → Communication → Modbus info → Device ID (7153)

Description　　　　　　Displays the device ID for identifying the measuring device.

User interface　　　　　4-digit hexadecimal number

Device revision

Navigation　　　　　　🖥🖥　Expert → Communication → Modbus info → Device revision (7154)

Description　　　　　　Displays the device revision.

User interface　　　　　4-digit hexadecimal number

3.6.3   "Modbus data map" submenu

Navigation   📖   Expert → Communication → Modbus data map

```
▶ Modbus data map

            Scan list register 0 to 15 (7114)                    →  🖺 166
```
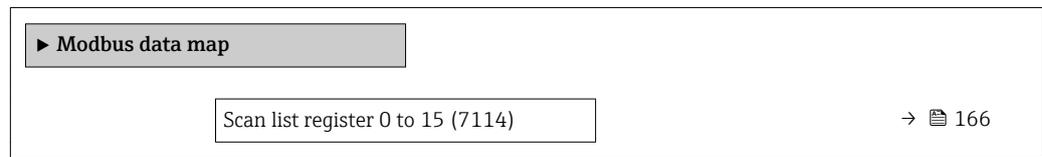
Scan list register 0 to 15	🔒

Navigation   📖📟   Expert → Communication → Modbus data map → Scan list reg.0 to 15 (7114)

Description   Use this function to enter the scan list register. By entering the register address (1-based), up to 16 device parameters can be grouped by assigning them to the scan list registers 0 to 15. The data of the device parameters assigned here are read out via the register addresses 5051 to 5081.

User entry   1 to 65 535

Factory setting   1

3.6.4   "Web server" submenu

Navigation   📖📟   Expert → Communication → Web server

```
▶ Web server

            Web server language (7221)                →  🖺 167

            MAC address (7214)                        →  🖺 167

            IP address (7209)                         →  🖺 168

            Subnet mask (7211)                        →  🖺 168

            Default gateway (7210)                    →  🖺 168

            Web server functionality (7222)           →  🖺 168

            Login page (7273)                         →  🖺 169
```
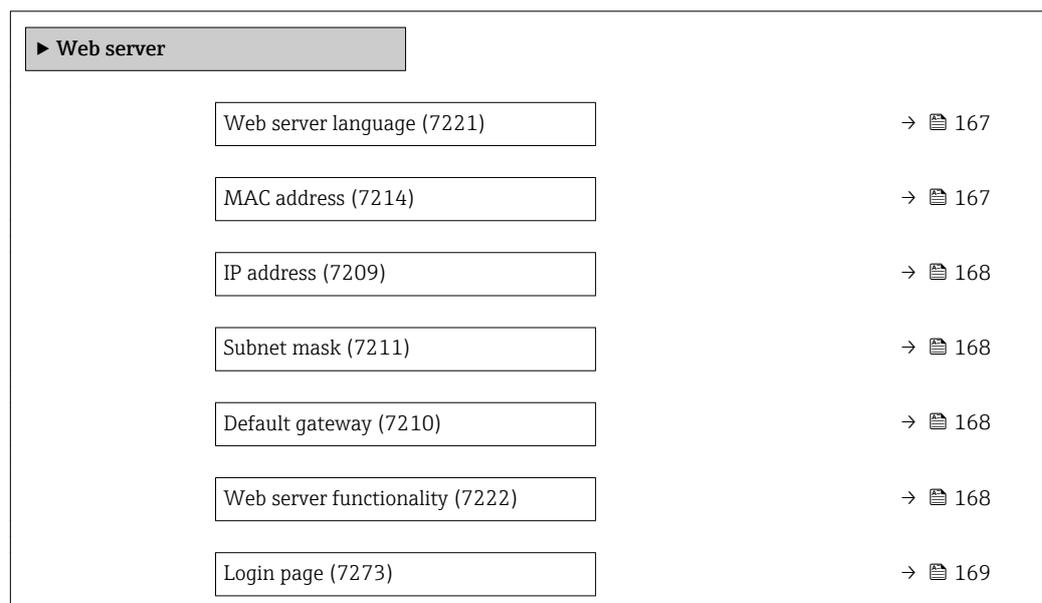
Web server language	

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 (Russian) * • Svenska * • Türkçe * • 中文 (Chinese) * • 日本語 (Japanese) * • 한국어 (Korean) * • العَرَبِيّة (Arabic) * • Bahasa Indonesia * • ภาษาไทย (Thai) * • tiếng Việt (Vietnamese) * • čeština (Czech) *

Factory setting	English

MAC address	

Navigation	⊞⊟ Expert → Communication → Web server → MAC Address (7214)

Description	Displays the MAC [8] address of the measuring device.

User interface	Unique 12-digit character string comprising letters and numbers

Factory setting	Each measuring device is given an individual address.

Additional information	*Example* For the display format 00:07:05:10:01:5F

---

* Visibility depends on order options or device settings
8) Media Access Control

IP address	🔒

Navigation	🖩🗏 Expert → Communication → Web server → IP address (7209)
Description	Displays the IP address of the device's web server.
User interface	4 octet: 0 to 255 (in the particular octet)
Factory setting	192.168.1.212

Subnet mask	🔒

Navigation	🖩🗏 Expert → Communication → Web server → Subnet mask (7211)
Description	Displays the subnet mask.
User interface	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	Displays the default gateway.
User interface	4 octet: 0 to 255 (in the particular octet)
Factory setting	0.0.0.0

Web server functionality	🔒

Navigation	🖩🗏 Expert → Communication → Web server → Webserver funct. (7222)
Description	Use this function to switch the Web server on and off.
Selection	• Off • On
Factory setting	On

Additional information   *Description*

   Once disabled, the Web server functionality can only be re-enabled via or the
operating tool FieldCare.

Selection

Option	Description
Off	• The web server is completely disabled. • Port 80 is locked.
On	• 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)	→ 🖻 170
WLAN IP address (2711)	→ 🖻 170
WLAN subnet mask (2709)	→ 🖻 170
WLAN MAC address (2703)	→ 🖻 171
Security type (2705)	→ 🖻 171
WLAN passphrase (2706)	→ 🖻 171
Assign SSID name (2708)	→ 🖻 172
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Select antenna (2713)	→ 🖹 172
2.4 GHz WLAN channel (2704)	→ 🖹 173
Apply changes (2712)	→ 🖹 173

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 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 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)
Factory setting	255.255.255.0

WLAN MAC address

Navigation	🔘🔲 Expert → Communication → WLAN settings → WLAN MAC address (2703)
Description	Displays the MAC [9] 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

Security type

Navigation	🔘🔲 Expert → Communication → WLAN settings → Security type (2705)
Description	Use this function to select the type of security for the WLAN interface.
Selection	• Unsecured • WPA2-PSK
Factory setting	WPA2-PSK
Additional information	*Selection* • Unsecured Access the WLAN connection without identification. • WPA2-PSK Access the WLAN connection with a network key.

WLAN passphrase

Navigation	🔘🔲 Expert → Communication → WLAN settings → WLAN passphrase (2706)
Prerequisite	In the **Security type** parameter (→ 🗎 171), the **WPA2-PSK** option is selected.
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)

---

9)   Media Access Control

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	• Device tag • User-defined
Factory setting	User-defined

Additional information	*Selection*
	• Device tag
	  The device tag name is used as the SSID.
	• User-defined
	  A user-defined name is used as the SSID.

SSID name	🔒

Navigation	🔘🔲 Expert → Communication → WLAN settings → SSID name (2707)
Prerequisite	In the **Assign SSID name** parameter (→ 🖹 172), the **User-defined** option is selected.
Description	Use this function to enter a user-defined SSID name.
User entry	Max. 32-digit character string comprising numbers, letters and special characters
Factory setting	EH_device designation_last 7 digits of the serial number (e.g. EH_Promass_500_A802000)

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

---

10)   Service Set Identifier

2.4 GHz WLAN channel

Navigation	◉◻ Expert → Communication → WLAN settings → WLAN channel (2704)
Description	Use this function to enter the 2.4 GHz WLAN channel.
User entry	1 to 11
Factory setting	6
Additional information	*Description*

- It is only necessary to enter a 2.4 GHz 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.

Apply changes

Navigation	◉◻ Expert → Communication → WLAN settings → Apply changes (2712)
Description	Use this function to adopt modified WLAN settings.
Selection	• Cancel • Ok
Factory setting	Cancel
Additional information	*Selection*

- Cancel
  No action is executed and the user exits the parameter.
- Ok
  The measuring device adopts the modified WLAN settings.

3.7 "Application" submenu

Navigation   ◉◻ Expert → Application

▸ Application	
Reset all totalizers (2806)	→ 🗎 174
▸ Totalizer 1 to n	→ 🗎 174
▸ Viscosity	→ 🗎 179

| ▶ Concentration | → 🖹 179 |
| ▶ Custody transfer | → 🖹 179 |

Reset all totalizers

Navigation 🖫🖳 Expert → Application → Reset all tot. (2806)

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

Selection • Cancel
• Reset + totalize

Factory setting Cancel

Additional information *Selection*

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

3.7.1 "Totalizer 1 to n" submenu

Navigation 🖫🖳 Expert → Application → Totalizer 1 to n

▶ Totalizer 1 to n	
Assign process variable (0914–1 to n)	→ 🖹 175
Unit totalizer 1 to n (0915–1 to n)	→ 🖹 175
Totalizer operation mode (0908–1 to n)	→ 🖹 176
Control Totalizer 1 to n (0912–1 to n)	→ 🖹 177
Preset value 1 to n (0913–1 to n)	→ 🖹 178
Failure mode (0901–1 to n)	→ 🖹 178

Assign process variable	⌾

Navigation	⌘⌨ Expert → Application → Totalizer 1 to n → Assign variable (0914–1 to n)
Description	Use this function to select a process variable for the Totalizer 1 to n.
Selection	• Off • Volume flow • Mass flow • Corrected volume flow • Target mass flow * • Carrier mass flow *
Factory setting	Mass flow
Additional information	*Description* ![i] If the option selected is changed, the device resets the totalizer to 0. *Selection* If the **Off** option is selected, only **Assign process variable** parameter (→ 🗎 175) is still displayed in the **Totalizer 1 to n** submenu. All other parameters in the submenu are hidden.

Unit totalizer 1 to n	⌾

Navigation	⌘⌨ Expert → Application → Totalizer 1 to n → Unit totalizer 1 to n (0915–1 to n)
Prerequisite	One of the following options is selected in the **Assign process variable** parameter (→ 🗎 175)**Totalizer 1 to n** submenu: • Volume flow • Mass flow • Corrected volume flow • Target mass flow * • Carrier mass flow *
Description	Use this function to select the process variable unit for the Totalizer 1 to n (→ 🗎 174).
Selection	*SI units* • g • kg • t *Custom-specific units* User mass or	*US units* • oz • lb • STon

---

*   Visibility depends on order options or device settings

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;liq.)
- bbl (us;beer)
- bbl (us;oil)
- bbl (us;tank)

Imperial units
- gal (imp)
- Mgal (imp)
- bbl (imp;beer)
- bbl (imp;oil)

Custom-specific units
User vol.

or

SI units
- Nl
- Nm³
- Sl
- Sm³

US units
- Sft³
- Sgal (us)
- Sbbl (us;liq.)

Imperial units
Sgal (imp)

Custom-specific units
UserCrVol.

Factory setting	Country-specific: • kg • lb
Additional information	*Description* The unit is selected separately for each totalizer. It is independent of the selection made in the **System units** submenu (→ 🖹 61). *Selection* The selection is dependent on the process variable selected in the **Assign process variable** parameter (→ 🖹 175).

Totalizer operation mode	🔒

Navigation	🔀🔲 Expert → Application → Totalizer 1 to n → Operation mode (0908–1 to n)
Prerequisite	One of the following options is selected in the **Assign process variable** parameter (→ 🖹 175)**Totalizer 1 to n** submenu: • Volume flow • Mass flow • Corrected volume flow • Target mass flow [*] • Carrier mass flow [*]
Description	Use this function to select how the totalizer summates the flow.

---

* Visibility depends on order options or device settings

Selection	• Net flow total
	• Forward flow total
	• Reverse flow total

Factory setting	Net flow total

Additional information	*Selection*

• **Net flow total**
Flow values in the forward and reverse flow direction are totalized and balanced against one another. Net flow is registered in the flow direction.
• **Forward flow total**
Only the flow in the forward flow direction is totalized.
• **Reverse flow total**
Only the flow in the reverse flow direction is totalized (= reverse flow quantity).

Control Totalizer 1 to n

Navigation	圖圖 Expert → Application → Totalizer 1 to n → Control Tot. 1 to n (0912–1 to n)

Prerequisite	One of the following options is selected in the **Assign process variable** parameter (→ 🖺 175)**Totalizer 1 to n** submenu:
	• Volume flow
	• Mass flow
	• Corrected volume flow
	• Target mass flow [*]
	• Carrier mass flow [*]

Description	Use this function to select the control of totalizer value 1-3.

Selection	• Totalize
	• Reset + hold
	• Preset + hold
	• Reset + totalize
	• Preset + totalize
	• Hold

Factory setting	Totalize

Additional information	*Selection*

Options	Description
Totalize	The totalizer is started or continues running.
Reset + hold	The totaling process is stopped and the totalizer is reset to 0.
Preset + hold	The totaling process is stopped and the totalizer is set to its defined start value from the **Preset value** parameter.
Reset + totalize	The totalizer is reset to 0 and the totaling process is restarted.
Preset + totalize	The totalizer is set to the defined start value from the **Preset value** parameter and the totaling process is restarted.
Hold	Totalizing is stopped.

---

* Visibility depends on order options or device settings

Preset value 1 to n	

Navigation	⑧⑧ Expert → Application → Totalizer 1 to n → Preset value 1 to n (0913–1 to n)
Prerequisite	One of the following options is selected in the **Assign process variable** parameter (→ 🖹 175)**Totalizer 1 to n** submenu: • Volume flow • Mass flow • Corrected volume flow • Target mass flow * • Carrier mass flow *
Description	Use this function to enter a start value for the Totalizer 1 to n.
User entry	Signed floating-point number
Factory setting	Country-specific: • 0 kg • 0 lb
Additional information	*User entry* ℹ️ The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 🖹 175). *Example* This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.

Failure mode	🔒

Navigation	⑧⑧ Expert → Application → Totalizer 1 to n → Failure mode (0901–1 to n)
Prerequisite	One of the following options is selected in the **Assign process variable** parameter (→ 🖹 175)**Totalizer 1 to n** submenu: • Volume flow • Mass flow • Corrected volume flow • Target mass flow * • Carrier mass flow *
Description	Use this function to select how a totalizer behaves in the event of a device alarm.
Selection	• Stop • Actual value • Last valid value
Factory setting	Stop

---

*   Visibility depends on order options or device settings

Additional information   *Description*

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

Selection

- Stop
  The totalizer is stopped in the event of a device alarm.
- Actual value
  The totalizer continues to count based on the actual measured value; the device alarm is
  ignored.
- Last valid value
  The totalizer continues to count based on the last valid measured value before the device
  alarm occurred.

3.7.2   "Viscosity" submenu

ℹ️ Only available for Promass I.

📖 For detailed information on the parameter descriptions for the **Viscosity** application
package,refer to the Special Documentation for the device → 📖 8

Navigation   ▣▤   Expert → Application → Viscosity

┌───┐
│ ▶ Viscosity   │
│   │
│   ┌──────────────────────────────────┐   │
│   │ Viscosity damping (1883)   │   │
│   └──────────────────────────────────┘   │
│   │
│   ┌──────────────────────────────────┐   │
│   │ ▶ Temperature compensation   │   │
│   └──────────────────────────────────┘   │
│   │
│   ┌──────────────────────────────────┐   │
│   │ ▶ Dynamic viscosity   │   │
│   └──────────────────────────────────┘   │
│   │
│   ┌──────────────────────────────────┐   │
│   │ ▶ Kinematic viscosity   │   │
│   └──────────────────────────────────┘   │
└───┘
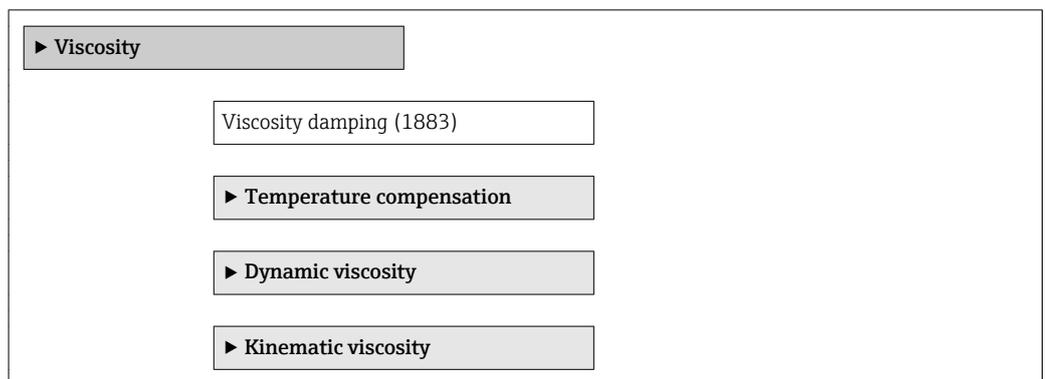
3.7.3   "Concentration" submenu

📖 For detailed information on the parameter descriptions for the **Concentration**
application package,refer to the Special Documentation for the device → 📖 8

Navigation   ▣▤   Expert → Application → Concentration

┌───┐
│ ▶ Concentration   │
└───┘

3.7.4   "Custody transfer" submenu

ℹ️ Only available for Promass F, O, Q and X.

📖 For detailed information on the parameter descriptions for custody transfer
measurement, see the Special Documentation for the device → 📖 8

```
‣ Custody transfer

                    Custody transfer mode (14405)

                    Checksum (14407)

                    Custody transfer locking (14406)

                    Custody transfer counter (14402)

                    Timestamp last custody transfer
                    (14403)
```

3.8 "Diagnostics" submenu

```
‣ Diagnostics

        Actual diagnostics (0691)                              → 🗎 181

        Previous diagnostics (0690)                            → 🗎 182

        Operating time from restart (0653)                     → 🗎 182

        Operating time (0652)                                  → 🗎 183

        ‣ Diagnostic list                                      → 🗎 183

        ‣ Event logbook                                        → 🗎 187

        ‣ Custody transfer logbook                             → 🗎 189

        ‣ Device information                                   → 🗎 190

        ‣ Mainboard module                                     → 🗎 193

        ‣ Sensor electronic module (ISEM)                      → 🗎 194

        ‣ I/O module 1                                         → 🗎 194

        ‣ I/O module 2                                         → 🗎 195

        ‣ I/O module 3                                         → 🗎 196

        ‣ I/O module 4                                         → 🗎 197
```

▶ Display module	→ 🖹 197
▶ Min/max values	→ 🖹 206
▶ Data logging	→ 🖹 198
▶ Heartbeat	→ 🖹 218
▶ Simulation	→ 🖹 218

Actual diagnostics

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*

ℹ️ Additional pending diagnostic messages can be viewed in the **Diagnostic list** submenu (→ 🖹 183).

ℹ️ 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 electronic failure

Timestamp

Navigation   🖥 Expert → Diagnostics → Timestamp

Description   Displays the operating time when the current diagnostic message occurred.

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

Additional information   *Display*

ℹ️ The diagnostic message can be viewed via the **Actual diagnostics** parameter (→ 🖹 181).

Example

For the display format:
24d12h13m00s

Previous diagnostics

Navigation	🖩🖥 Expert → Diagnostics → Prev.diagnostics (0690)
Prerequisite	Two diagnostic events have already occurred.
Description	Displays the diagnostic message that occurred before the current message.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	*Display*

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.

Example

For the display format:
⊗F271 Main electronic failure

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*

ℹ The diagnostic message can be viewed via the **Previous diagnostics** parameter (→ 🖺 182).

Example

For the display format:
24d12h13m00s

Operating time from 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.

3.8.1 "Diagnostic list" submenu

Navigation   ⌨️🔲 Expert → Diagnostics → Diagnostic list

▸ Diagnostic list	
Diagnostics 1 (0692)	→ 🔖 183
Diagnostics 2 (0693)	→ 🔖 184
Diagnostics 3 (0694)	→ 🔖 185
Diagnostics 4 (0695)	→ 🔖 186
Diagnostics 5 (0696)	→ 🔖 186

Diagnostics 1

Navigation	⌨️🔲 Expert → Diagnostics → Diagnostic list → Diagnostics 1 (0692)
Description	Displays the current diagnostics message with the highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	*Display*

ℹ️ 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 electronic failure
- ⊗F276 I/O module failure

Timestamp

Navigation	🔲 Expert → Diagnostics → Diagnostic list → Timestamp
Description	Displays the operating time when the diagnostic message with the highest priority occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	*Display*

i   The diagnostic message can be viewed via the **Diagnostics 1** parameter (→ 📖 183).

Example

For the display format:
24d12h13m00s

Diagnostics 2

Navigation	🔘🔲 Expert → Diagnostics → Diagnostic list → Diagnostics 2 (0693)
Description	Displays the current diagnostics message with the second-highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	*Display*

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 electronic failure
- ⊗F276 I/O module failure

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 (→ 🖺 184).

    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 electronic failure
    • ⊗F276 I/O module failure

Timestamp

Navigation   🖳   Expert → Diagnostics → Diagnostic list → Timestamp

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

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

Additional information   *Display*

    The diagnostic message can be viewed via the **Diagnostics 3** parameter (→ 🖺 185).

    Example

    For the display format:
    24d12h13m00s

Diagnostics 4

Navigation	0 Expert → Diagnostics → Diagnostic list → Diagnostics 4 (0695)
Description	Displays the current diagnostics message with the fourth-highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	*Display*

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

Examples

For the display format:
- 🚫F271 Main electronic failure
- 🚫F276 I/O module failure

Timestamp

Navigation	0 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 (→ 🔲 186).

Example

For the display format:
24d12h13m00s

Diagnostics 5

Navigation	0 Expert → Diagnostics → Diagnostic list → Diagnostics 5 (0696)
Description	Displays the current diagnostics message with the fifth-highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.

Additional information	*Display*

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

Examples

For the display format:
- ⊗F271 Main electronic failure
- ⊗F276 I/O module failure

Timestamp

Navigation	⊟　　Expert → Diagnostics → Diagnostic list → Timestamp
Description	Displays the operating time when the diagnostic message with the fifth-highest priority occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	*Display*

The diagnostic message can be viewed via the **Diagnostics 5** parameter (→ 🖺 186).

Example

For the display format:
24d12h13m00s

3.8.2   "Event logbook" submenu

Navigation　　　⊡　　Expert → Diagnostics → Event logbook

▶ **Event logbook**

Filter options (0705)	→ 🖺 187
▶ **Event list**	→ 🖺 188
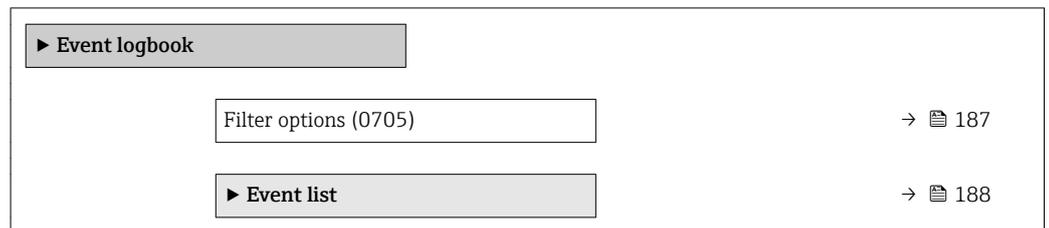
Filter options　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　🔒

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)
	• Function check (C)
	• Out of specification (S)
	• Maintenance required (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

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)
	• Function check (C)
	• Out of specification (S)
	• Maintenance required (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.

▸ Event list		
	Event list	→ 🗎 189

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 (→ 🗎 187).
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 electronic failure
  ⊕ 01d04h12min30s

HistoROM

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

3.8.3   "Custody transfer logbook" submenu

ℹ️   Only available for Promass F, O, Q and X.

📖   For detailed information on the parameter descriptions for custody transfer measurement, see the Special Documentation for the device → 🗎 8

Navigation   🗑🗑 Expert → Diagnostics → Cust.transf.log.

```
▶ Custody transfer logbook
```

3.8.4   "Device information" submenu

Navigation   🗑🗑 Expert → Diagnostics → Device info

```
▶ Device information

            Device tag                              →  🗎 190

            Serial number                           →  🗎 191

            Firmware version                        →  🗎 191

            Device name                             →  🗎 192

            Order code                              →  🗎 192

            Extended order code 1                   →  🗎 192

            Extended order code 2                   →  🗎 193

            Extended order code 3                   →  🗎 193

            ENP version                             →  🗎 193
```
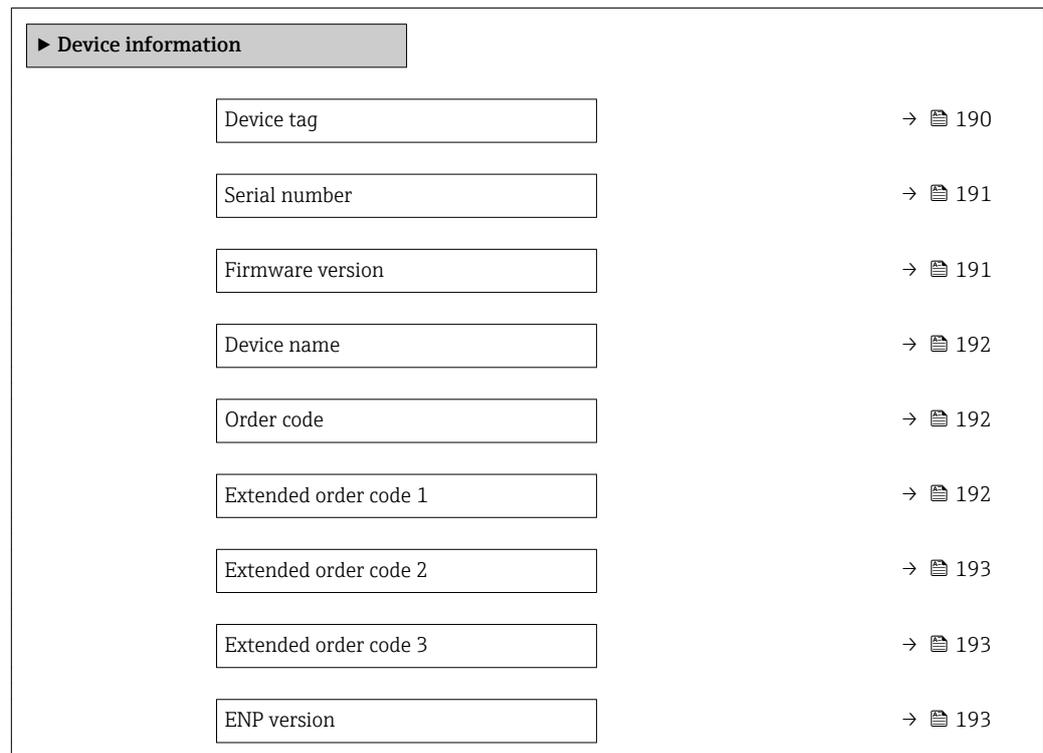
Device tag

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   Promass300 500MB

Additional information   *User interface*
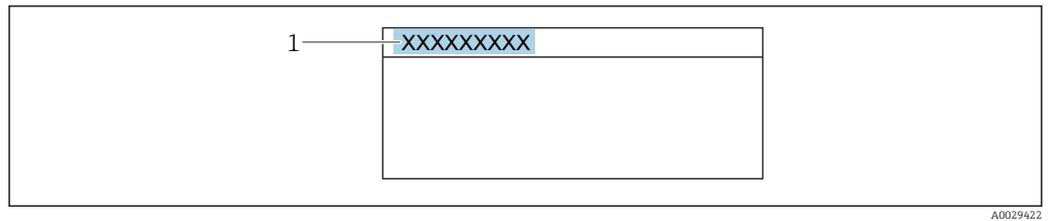
1   Position of the header text on the display

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.

ℹ The number can be found on the nameplate of the sensor and transmitter.

User interface   A maximum of 11-digit character string comprising letters and numbers.

Additional information   *Description*

ℹ 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*

ℹ 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	Promass300/500

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.

Extended order code 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.

Extended order code 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 **Extended order code 1** parameter (→ 🗎 192)

Extended order code 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 **Extended order code 1** parameter (→ 🗎 192)

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.

3.8.5   "Mainboard module" submenu

Navigation   🔐🖥 Expert → Diagnostics → Mainboard module

```
► Mainboard module

        Software revision (0072)                          → 🗎 194
```

Software revision

Navigation   ⓘⓔ   Expert → Diagnostics → Mainboard module → Software rev. (0072)

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

User interface   Positive integer

3.8.6   "Sensor electronic module (ISEM)" submenu

Navigation   ⓘⓔ   Expert → Diagnostics → Sens. electronic

```
▶ Sensor electronic module (ISEM)

                        Software revision (0072)                    → 🗎 194
```
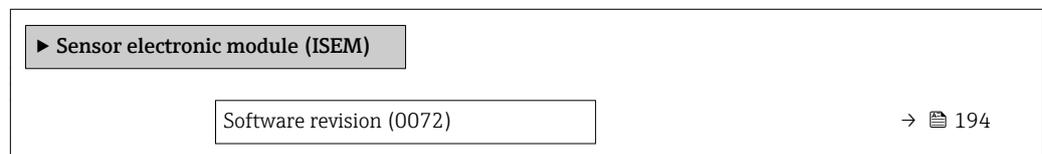
Software revision

Navigation   ⓘⓔ   Expert → Diagnostics → Sens. electronic → Software rev. (0072)

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

User interface   Positive integer

3.8.7   "I/O module 1" submenu

Navigation   ⓘⓔ   Expert → Diagnostics → I/O module 1

```
▶ I/O module 1

                        I/O module 1 terminal numbers          → 🗎 195
                        (3902–1)

                        Software revision (0072)               → 🗎 195
```
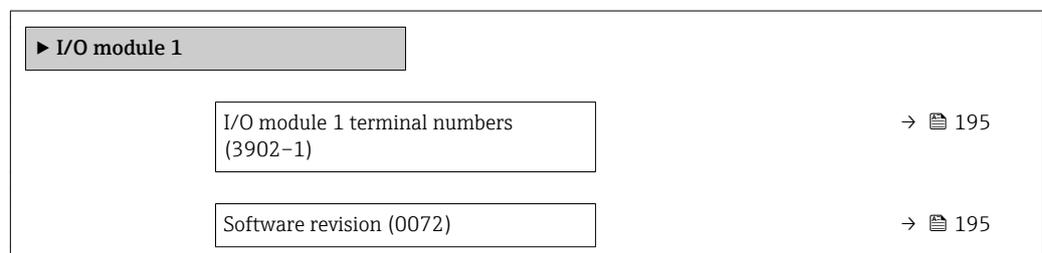
I/O module 1 terminal numbers

Navigation   ⑧⑤   Expert → Diagnostics → I/O module 1 → I/O 1 terminals (3902–1)

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

User interface   • Not used
                                  • 26-27 (I/O 1)
                                  • 24-25 (I/O 2)
                                  • 22-23 (I/O 3)
                                  • 20-21 (I/O 4) *

Software revision

Navigation   ⑧⑤   Expert → Diagnostics → I/O module 1 → Software rev. (0072)

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

User interface   Positive integer

3.8.8   "I/O module 2" submenu

Navigation   ⑧⑤   Expert → Diagnostics → I/O module 2

▶ I/O module 2	
I/O module 2 terminal numbers	→ 🗎 195
Software revision	→ 🗎 196

I/O module 2 terminal numbers

Navigation   ⑧⑤   Expert → Diagnostics → I/O module 2 → I/O 2 terminals (3902–2)

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

User interface   • Not used
                                  • 26-27 (I/O 1)
                                  • 24-25 (I/O 2)
                                  • 22-23 (I/O 3)
                                  • 20-21 (I/O 4) *

---

* Visibility depends on order options or device settings

Software revision

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

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

User interface   Positive integer

3.8.9   "I/O module 3" submenu

Navigation   Expert → Diagnostics → I/O module 3

```
▶ I/O module 3

                    I/O module 3 terminal numbers                    → 🕮 196

                    Software revision                                → 🕮 196
```
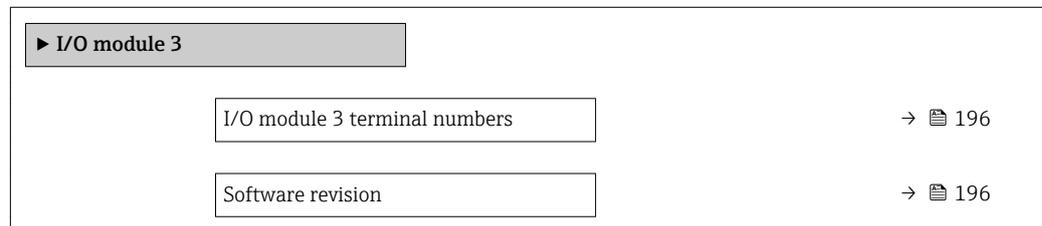
I/O module 3 terminal numbers

Navigation   Expert → Diagnostics → I/O module 3 → I/O 3 terminals (3902–3)

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

User interface   • Not used
                                • 26-27 (I/O 1)
                                • 24-25 (I/O 2)
                                • 22-23 (I/O 3)
                                • 20-21 (I/O 4) *

Software revision

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

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

User interface   Positive integer

---

*   Visibility depends on order options or device settings

3.8.10 "I/O module 4" submenu

Navigation　　　　　　🲭🲭　Expert → Diagnostics → I/O module 4

```
▸ I/O module 4
                    I/O module 4 terminal numbers                    → 🖪 197

                    Software revision                                → 🖪 197
```
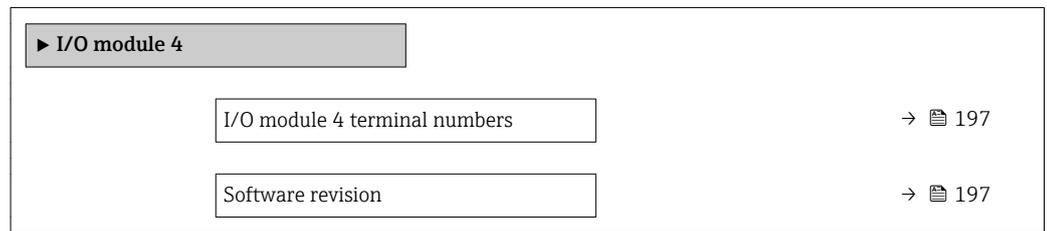
I/O module 4 terminal numbers

Navigation　　　　　　🲭🲭　Expert → Diagnostics → I/O module 4 → I/O 4 terminals (3902–4)

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

User interface　　　　• Not used
　　　　　　　　　　　　• 26-27 (I/O 1)
　　　　　　　　　　　　• 24-25 (I/O 2)
　　　　　　　　　　　　• 22-23 (I/O 3)
　　　　　　　　　　　　• 20-21 (I/O 4) *

Software revision

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

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

User interface　　　　Positive integer

3.8.11 "Display module" submenu

Navigation　　　　　　🲭🲭　Expert → Diagnostics → Display module

```
▸ Display module
                    Software revision (0072)                         → 🖪 198
```

---

*　　　Visibility depends on order options or device settings

Software revision

Navigation   🖩🖳   Expert → Diagnostics → Display module → Software rev. (0072)

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

User interface   Positive integer

3.8.12   "Data logging" submenu

Navigation   🖩🖳   Expert → Diagnostics → Data logging

```
‣ Data logging

              Assign channel 1 (0851)                          → 🗎 199

              Assign channel 2 (0852)                          → 🗎 200

              Assign channel 3 (0853)                          → 🗎 200

              Assign channel 4 (0854)                          → 🗎 200

              Logging interval (0856)                          → 🗎 201

              Clear logging data (0855)                        → 🗎 201

              Data logging (0860)                              → 🗎 202

              Logging delay (0859)                             → 🗎 202

              Data logging control (0857)                      → 🗎 203

              Data logging status (0858)                       → 🗎 203

              Entire logging duration (0861)                   → 🗎 204

              ‣ Display channel 1                              → 🗎 204

              ‣ Display channel 2                              → 🗎 205

              ‣ Display channel 3                              → 🗎 206

              ‣ Display channel 4                              → 🗎 206
```

Assign channel 1	🔒

Navigation	⧉🔲 Expert → Diagnostics → Data logging → Assign chan. 1 (0851)

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

ℹ️ The software options currently enabled are displayed in the **Software option overview** parameter (→ 🔲 46).

Description	Use this function to select a process variable for the data logging channel.

Selection	• Off
	• Mass flow
	• Volume flow
	• Corrected volume flow
	• Target mass flow *
	• Carrier mass flow *
	• Density
	• Reference density
	• Concentration *
	• Dynamic viscosity *
	• Kinematic viscosity *
	• Temp. compensated dynamic viscosity *
	• Temp. compensated kinematic viscosity *
	• Temperature
	• Carrier pipe temperature *
	• Electronic temperature
	• Oscillation frequency 0
	• Oscillation frequency 1 *
	• Frequency fluctuation 0
	• Frequency fluctuation 1 *
	• Oscillation amplitude *
	• Oscillation amplitude 1 *
	• Oscillation damping 0
	• Oscillation damping 1 *
	• Oscillation damping fluctuation 0
	• Oscillation damping fluctuation 1 *
	• Signal asymmetry
	• Exciter current 0
	• Exciter current 1 *
	• Current output 1
	• Current output 2 *
	• Current output 3 *

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

---

* Visibility depends on order options or device settings

Once the maximum number of data points is reached, the oldest data points in the data log are cyclically overwritten in such a way that the last 1000, 500, 333 or 250 measured values are always in the log (ring memory principle).

The log contents are cleared if the option selected is changed.

Assign channel 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 **Software option overview** parameter (→ 🖹 46).
Description	Options for the assignment of a process variable to the data logging channel.
Selection	Picklist, see **Assign channel 1** parameter (→ 🖹 199)
Factory setting	Off

Assign channel 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 **Software option overview** parameter (→ 🖹 46).
Description	Options for the assignment of a process variable to the data logging channel.
Selection	Picklist, see **Assign channel 1** parameter (→ 🖹 199)
Factory setting	Off

Assign channel 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 **Software option overview** parameter (→ 🖹 46).
Description	Options for the assignment of a process variable to the data logging channel.
Selection	Picklist, see **Assign channel 1** parameter (→ 🖹 199)

Factory setting   Off

Logging interval	🔒

Navigation	🎛️🖥️ Expert → Diagnostics → Data logging → Logging interval (0856)
Prerequisite	The **Extended HistoROM** application package is available.

ℹ️ The software options currently enabled are displayed in the **Software option overview** parameter (→ 🖺 46).

Description	Use this function to enter the logging interval T_{log} for data logging.
User entry	0.1 to 999.0 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).

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

Example

If 1 logging channel is used:
- $T_{log} = 1000 \times 1$ s = 1 000 s ≈15 min
- $T_{log} = 1000 \times 10$ s = 10 000 s ≈ 3 h
- $T_{log} = 1000 \times 80$ s = 80 000 s ≈ 1 d
- $T_{log} = 1000 \times 3\,600$ s = 3 600 000 s ≈ 41 d

Clear logging data	🔒

Navigation	🎛️🖥️ Expert → Diagnostics → Data logging → Clear logging (0855)
Prerequisite	The **Extended HistoROM** application package is available.

ℹ️ The software options currently enabled are displayed in the **Software option overview** parameter (→ 🖺 46).

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 (→ 🖺 202), 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 logging control** parameter
> (→ 🖺 203), the device does not save any data for the duration of the time delay entered.

Data logging control

Navigation	◎▣ Expert → Diagnostics → Data logging → Data log.control (0857)
Prerequisite	In the **Data logging** parameter (→ 🖺 202), the **Not overwriting** option is selected.
Description	Use this function to start and stop measured value logging.
Selection	• None • Delete + start • Stop
Factory setting	None
Additional information	*Selection*

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

Data logging status

Navigation	◎▣ Expert → Diagnostics → Data logging → Data log. status (0858)
Prerequisite	In the **Data logging** parameter (→ 🖺 202), the **Not overwriting** option is selected.
Description	Displays the measured value logging status.
User interface	• Done • Delay active • Active • Stopped
Factory setting	Done
Additional information	*Selection*

• Done
  Measured value logging has been performed and completed successfully.
• Delay active
  Measured value logging has been started but the logging interval has not yet elapsed.
• Active
  The logging interval has elapsed and measured value logging is active.
• Stopped
  Measured value logging is stopped.

Entire logging duration

Navigation	😊😊 Expert → Diagnostics → Data logging → Logging duration (0861)
Prerequisite	In the **Data logging** parameter (→ 🗎 202), the **Not overwriting** option is selected.
Description	Displays the total logging duration.
User interface	Positive floating-point number
Factory setting	0 s

"Display channel 1" submenu

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

```
▸ Display channel 1

                              Display channel 1          →  🗎 204
```

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 **Software option overview** parameter (→ 🗎 46).

One of the following options is selected in the **Assign channel 1** parameter (→ 🗎 199):
- Mass flow
- Volume flow
- Corrected volume flow
- Target mass flow [*]
- Carrier mass flow [*]
- Density
- Reference density
- Concentration [*]
- Dynamic viscosity [*]
- Kinematic viscosity [*]
- Temp. compensated dynamic viscosity [*]
- Temp. compensated kinematic viscosity [*]
- Carrier pipe temperature [*]
- Electronic temperature
- Current output 1
- Oscillation frequency 0
- Oscillation frequency 1 [*]

---

*   Visibility depends on order options or device settings

- Frequency fluctuation 0
- Frequency fluctuation 1 *
- Oscillation amplitude *
- Oscillation amplitude 1 *
- Oscillation damping 0
- Oscillation damping 1 *
- Oscillation damping fluctuation 0
- Oscillation damping fluctuation 1 *
- Signal asymmetry
- Exciter current 0
- Exciter current 1 *

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

Additional information　　*Description*
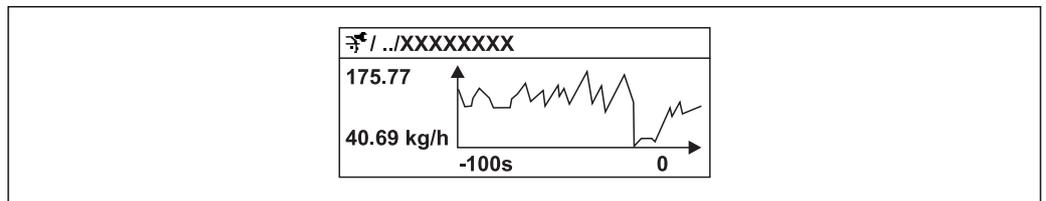
⊞9　　Chart of a measured value trend

- 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.

"Display channel 2" submenu

Navigation　　　　⊞　Expert → Diagnostics → Data logging → Displ.channel 2

▸ Display channel 2		
	Display channel 2	→ 🖹 205
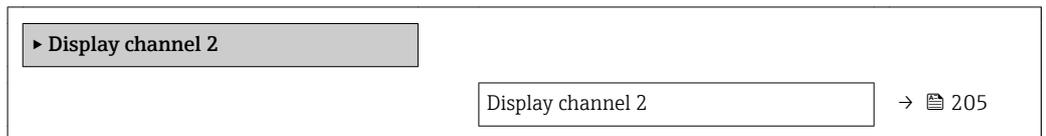
Display channel 2

Navigation　　　　⊞　Expert → Diagnostics → Data logging → Displ.channel 2

Prerequisite　　　A process variable is defined in the **Assign channel 2** parameter.

Description　　　　See the **Display channel 1** parameter → 🖹 204

---

* Visibility depends on order options or device settings

"Display channel 3" submenu

Navigation   Expert → Diagnostics → Data logging → Displ.channel 3

▸ Display channel 3		
	Display channel 3	→ 🗎 206
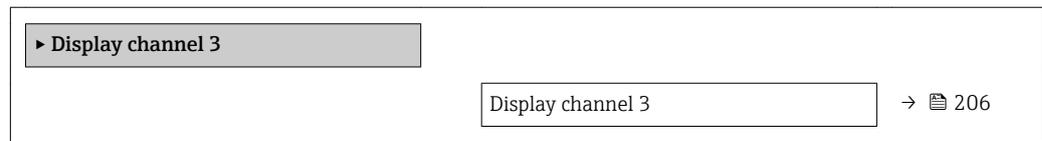
Display channel 3

Navigation   Expert → Diagnostics → Data logging → Displ.channel 3

Prerequisite   A process variable is defined in the **Assign channel 3** parameter.

Description   See the **Display channel 1** parameter → 🗎 204

"Display channel 4" submenu

Navigation   Expert → Diagnostics → Data logging → Displ.channel 4

▸ Display channel 4		
	Display channel 4	→ 🗎 206

Display channel 4

Navigation   Expert → Diagnostics → Data logging → Displ.channel 4

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

Description   See the **Display channel 1** parameter → 🗎 204

3.8.13   "Min/max values" submenu

Navigation   Expert → Diagnostics → Min/max val.

▸ Min/max values	
	Reset min/max values (6151)	→ 🗎 207
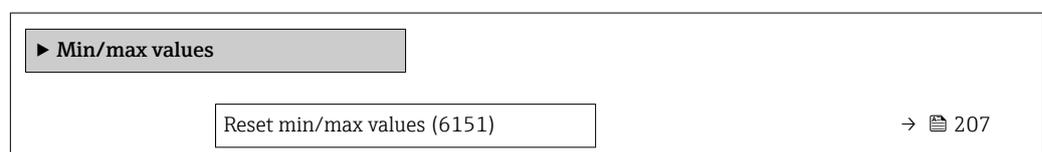
▶ Main electronic temperature	→ 🖹 208
▶ Sensor electronic temperature (ISEM)	→ 🖹 209
▶ Medium temperature	→ 🖹 210
▶ Carrier pipe temperature	→ 🖹 210
▶ Oscillation frequency	→ 🖹 212
▶ Torsion oscillation frequency	→ 🖹 212
▶ Oscillation amplitude	→ 🖹 213
▶ Torsion oscillation amplitude	→ 🖹 214
▶ Oscillation damping	→ 🖹 215
▶ Torsion oscillation damping	→ 🖹 215
▶ Signal asymmetry	→ 🖹 216
▶ Torsion signal asymmetry	→ 🖹 217

Reset min/max values   🔒

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
                                • Oscillation amplitude
                                • Oscillation amplitude 1 *
                                • Oscillation damping
                                • Torsion oscillation damping *
                                • Oscillation frequency
                                • Torsion oscillation frequency *
                                • Signal asymmetry
                                • Torsion signal asymmetry *

Factory setting   Cancel

---

*   Visibility depends on order options or device settings

"Main electronic temperature" submenu

Navigation   Expert → Diagnostics → Min/max val. → Main elect.temp.

```
► Main electronic temperature

                Minimum value (0688)                              →  🗎 208

                Maximum value (0665)                              →  🗎 208
```

Minimum value

Navigation	Expert → Diagnostics → Min/max val. → Main elect.temp. → Minimum value (0688)
Description	Displays the lowest previously measured temperature value of the electronics module in the transmitter.
User interface	Signed floating-point number
Additional information	*Dependency*

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

Maximum value

Navigation	Expert → Diagnostics → Min/max val. → Main elect.temp. → Maximum value (0665)
Description	Displays the highest previously measured temperature value of the electronics module in the transmitter.
User interface	Signed floating-point number
Additional information	*Dependency*

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

"Sensor electronic temperature (ISEM)" submenu

Navigation　　　　⌨️🖥️　Expert → Diagnostics → Min/max val. → Sensor elec.temp

```
▶ Sensor electronic temperature
  (ISEM)

                    Minimum value (6052)                    → 🗎 209

                    Maximum value (6051)                    → 🗎 209
```

Maximum value

Navigation　　　　⌨️🖥️　Expert → Diagnostics → Min/max val. → Sensor elec.temp → Maximum value (6051)

Description　　　　Displays the highest previously measured temperature value of the electronics module in the sensor connection housing.

User interface　　　　Signed floating-point number

Additional information　　　　*Dependency*

ℹ️　The unit is taken from the **Temperature unit** parameter (→ 🗎 68)

Minimum value

Navigation　　　　⌨️🖥️　Expert → Diagnostics → Min/max val. → Sensor elec.temp → Minimum value (6052)

Description　　　　Displays the lowest previously measured temperature value of the electronics module in the sensor connection housing.

User interface　　　　Signed floating-point number

Additional information　　　　*Dependency*

ℹ️　The unit is taken from the **Temperature unit** parameter (→ 🗎 68)

"Medium temperature" submenu

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

```
▸ Medium temperature

        Minimum value (6109)                                    → 🗎 210

        Maximum value (6108)                                    → 🗎 210
```

Minimum value

Navigation   😑😑 Expert → Diagnostics → Min/max val. → Medium temp. → Minimum value (6109)

Description   Displays the lowest previously measured medium temperature value.

User interface   Signed floating-point number

Additional information *Dependency*

😊 The unit is taken from the **Temperature unit** parameter (→ 🗎 68)

Maximum value

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

Description   Displays the highest previously measured medium temperature value.

User interface   Signed floating-point number

Additional information *Dependency*

😊 The unit is taken from the **Temperature unit** parameter (→ 🗎 68)

"Carrier pipe temperature" submenu

Navigation   😑😑 Expert → Diagnostics → Min/max val. → Carr. pipe temp.

```
▸ Carrier pipe temperature

        Minimum value (6030)                                    → 🗎 211

        Maximum value (6029)                                    → 🗎 211
```

Minimum value	

Navigation	⊞⊟ Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Minimum value (6030)
Prerequisite	ℹ️ Only available for: • Promass A • Promass F • Promass H • Promass I • Promass O • Promass P • PromassQ • Promass S • Promass X For the following order code "Application package", option **EB** "Heartbeat Verification + Monitoring"
Description	Displays the lowest previously measured temperature value of the carrier pipe.
User interface	Signed floating-point number
Additional information	*Dependency* ℹ️ The unit is taken from the **Temperature unit** parameter (→ 🖺 68)

Maximum value	

Navigation	⊞⊟ Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Maximum value (6029)
Prerequisite	ℹ️ Only available for: • Promass A • Promass F • Promass H • Promass I • Promass O • Promass P • PromassQ • Promass S • Promass X For the following order code "Application package", option **EB** "Heartbeat Verification + Monitoring"
Description	Displays the highest previously measured temperature value of the carrier pipe.
User interface	Signed floating-point number
Additional information	*Dependency* ℹ️ The unit is taken from the **Temperature unit** parameter (→ 🖺 68)

"Oscillation frequency" submenu

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

```
▶ Oscillation frequency

                    Minimum value (6071)                          →  🖹 212

                    Maximum value (6070)                          →  🖹 212
```

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

"Torsion oscillation frequency" submenu

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

```
▶ Torsion oscillation frequency

                    Minimum value (6069)                          →  🖹 213

                    Maximum value (6068)                          →  🖹 213
```

Minimum value

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

Maximum value

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

"Oscillation amplitude" submenu

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

▶ Oscillation amplitude	
Minimum value (6010)	→ 🗎 213
Maximum value (6009)	→ 🗎 214

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

"Torsion oscillation amplitude" submenu

Navigation   @@ Expert → Diagnostics → Min/max val. → Tor. osc. amp.

► Torsion oscillation amplitude	
Minimum value (6008)	→ 🗎 214
Maximum value (6007)	→ 🗎 214
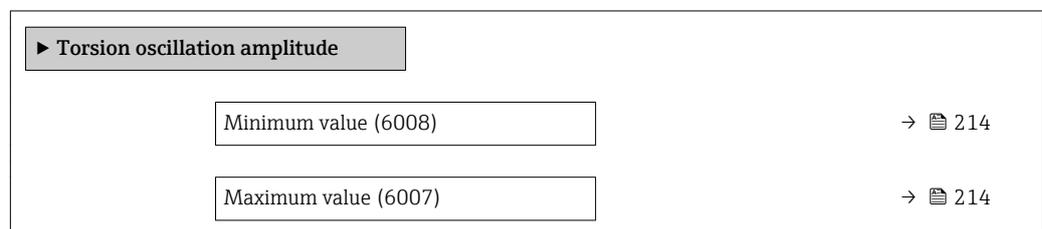
Minimum value

Navigation   @@ Expert → Diagnostics → Min/max val. → Tor. osc. amp. → Minimum value (6008)

Prerequisite   ℹ Only available for Promass I.

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

Description   Displays the lowest previously measured torsion oscillation amplitude.

User interface   Signed floating-point number

Maximum value

Navigation   @@ Expert → Diagnostics → Min/max val. → Tor. osc. amp. → Maximum value (6007)

Prerequisite   ℹ Only available for Promass I.

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

Description   Displays the highest previously measured torsion oscillation amplitude.

User interface   Signed floating-point number

"Oscillation damping" submenu

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

```
‣ Oscillation damping

                    Minimum value (6122)                    →  🖹 215

                    Maximum value (6121)                    →  🖹 215
```

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

"Torsion oscillation damping" submenu

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

```
‣ Torsion oscillation damping

                    Minimum value (6120)                    →  🖹 216

                    Maximum value (6119)                    →  🖹 216
```

Minimum value

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

Maximum value

Navigation	🔍🖥 Expert → Diagnostics → Min/max val. → Tors.oscil.damp. → Maximum value (6119)
Prerequisite	🔵 Only available for Promass I. For the following order code: "Application package", option **EB** "Heartbeat Verification + Monitoring"
Description	Displays the highest previously measured torsion oscillation damping.
User interface	Signed floating-point number

"Signal asymmetry" submenu

Navigation   🔍🖥 Expert → Diagnostics → Min/max val. → Signal asymmetry

▶ Signal asymmetry

Minimum value (6015)	→ 🔖 216
Maximum value (6014)	→ 🔖 217

Minimum value

Navigation	🔍🖥 Expert → Diagnostics → Min/max val. → Signal asymmetry → Minimum value (6015)
Description	Displays the lowest previously measured signal asymmetry.

| User interface | Signed floating-point number |

Maximum value

Navigation	⊞⊟ Expert → Diagnostics → Min/max val. → Signal asymmetry → Maximum value (6014)
Description	Displays the highest previously measured signal asymmetry.
User interface	Signed floating-point number

"Torsion signal asymmetry" submenu

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

```
► Torsion signal asymmetry

        Minimum value (6284)                          → 🖺 217

        Maximum value (6283)                          → 🖺 217
```

Minimum value

| Navigation | ⊞⊟ Expert → Diagnostics → Min/max val. → Tors.sig.asymm. → Minimum value (6284) |
| Prerequisite | 🛈 Only available for Promass I. |

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

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

Maximum value

| Navigation | ⊞⊟ Expert → Diagnostics → Min/max val. → Tors.sig.asymm. → Maximum value (6283) |
| Prerequisite | 🛈 Only available for Promass I. |

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

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

3.8.14 "Heartbeat" submenu

For detailed information on the parameter descriptions for the **Heartbeat Verification+Monitoring** application package, refer to the Special Documentation for the device → 🗎 8

Navigation   🖩🖵   Expert → Diagnostics → Heartbeat
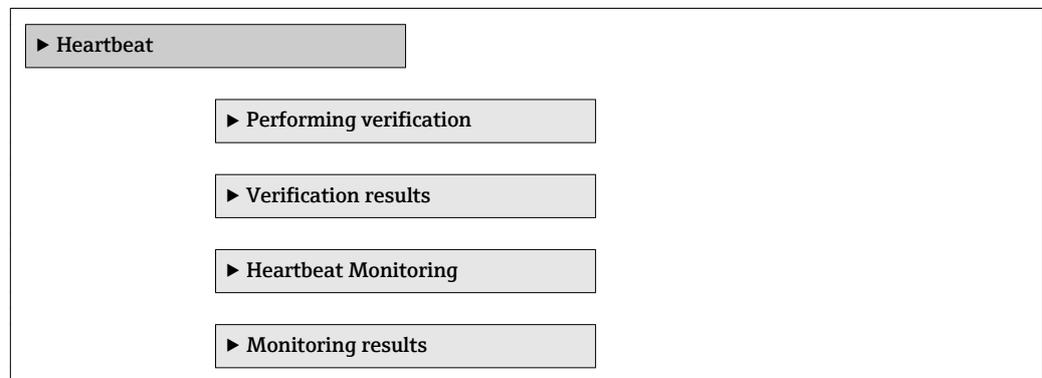
```
‣ Heartbeat
                        ‣ Performing verification
                        ‣ Verification results
                        ‣ Heartbeat Monitoring
                        ‣ Monitoring results
```

3.8.15 "Simulation" submenu

Navigation   🖩🖵   Expert → Diagnostics → Simulation

```
‣ Simulation
            Assign simulation process variable        → 🗎 219
            (1810)

            Process variable value (1811)             → 🗎 220

            Status input simulation (1355)            → 🗎 220

            Input signal level (1356)                 → 🗎 221

            Current input 1 to n simulation           → 🗎 221
            (1608–1 to n)

            Value current input 1 to n                → 🗎 222
            (1609–1 to n)

            Current output 1 to n simulation          → 🗎 222
            (0354–1 to n)
```
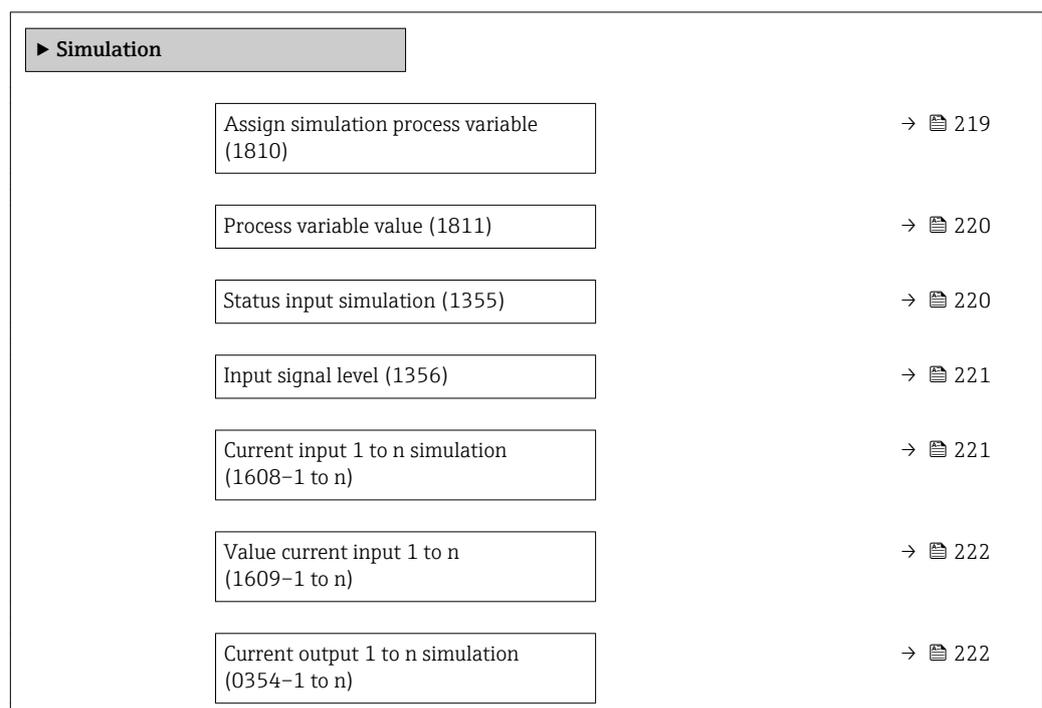
Value current output 1 to n (0355–1 to n)	→ 🖹 222
Frequency output simulation 1 to n (0472–1 to n)	→ 🖹 223
Frequency value 1 to n (0473–1 to n)	→ 🖹 223
Pulse output simulation 1 to n (0458–1 to n)	→ 🖹 224
Pulse value 1 to n (0459–1 to n)	→ 🖹 224
Switch output simulation 1 to n (0462–1 to n)	→ 🖹 224
Switch status 1 to n (0463–1 to n)	→ 🖹 225
Relay output 1 to n simulation (0802–1 to n)	→ 🖹 225
Switch status 1 to n (0803–1 to n)	→ 🖹 226
Pulse output simulation (0988)	→ 🖹 226
Pulse value (0989)	→ 🖹 227
Device alarm simulation (0654)	→ 🖹 227
Diagnostic event category (0738)	→ 🖹 228
Diagnostic event simulation (0737)	→ 🖹 228

Assign simulation process variable   🔒

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
- Corrected volume flow
- Density
- Reference density
- Temperature

- Dynamic viscosity [*]
- Kinematic viscosity [*]
- Temp. compensated dynamic viscosity [*]
- Temp. compensated kinematic viscosity [*]
- Concentration [*]
- Target mass flow [*]
- Carrier mass flow [*]

Factory setting	Off
Additional information	*Description*

The simulation value of the process variable selected is defined in the **Process variable value** parameter (→ 🖺 220).

Process variable value   🔒

Navigation	🔘🖳 Expert → Diagnostics → Simulation → Proc. var. value (1811)
Description	Use this function to enter a simulation value for the selected process variable. Subsequent measured value processing and the signal output use this simulation value. In this way, users can verify whether the measuring device has been configured correctly.
User entry	Depends on the process variable selected
Factory setting	0
Additional information	*User entry*

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

Status input simulation   🔒

Navigation	🔘🖳 Expert → Diagnostics → Simulation → Status inp. sim. (1355)
Description	Use this function to switch simulation of the status input on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.
Selection	• Off • On
Factory setting	Off

---

*   Visibility depends on order options or device settings

Additional information   *Description*

ℹ️ The desired simulation value is defined in the **Input signal level** parameter
(→ 🖺 221).

Selection

• Off
Simulation for the status input is switched off. The device is in normal measuring mode
or another process variable is being simulated.
• On
Simulation for the status input is active.

Input signal level   🔒

Navigation   🔲🔳 Expert → Diagnostics → Simulation → Signal level (1356)

Prerequisite   In the **Status input simulation** parameter (→ 🖺 220), the **On** option is selected.

Description   Use this function to select the signal level for the simulation of the status input. In this
way, users can verify the correct configuration of the status input and the correct function
of upstream feed-in units.

Selection   • High
• Low

Current input 1 to n simulation   🔒

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.

ℹ️ The desired simulation value is defined in the **Value current input 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 current input 1 to n

Navigation	⌨◫ Expert → Diagnostics → Simulation → Value curr.inp 1 to n (1609–1 to n)
Prerequisite	In the **Current input 1 to n simulation** 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

Current output 1 to n simulation

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 current output 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 current output 1 to n

Navigation	⌨◫ Expert → Diagnostics → Simulation → Value curr.out 1 to n (0355–1 to n)
Prerequisite	In the **Current output 1 to n simulation** 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
(→ 🖺 111).

Frequency output simulation 1 to n	🔒

Navigation   🖩🖵 Expert → Diagnostics → Simulation → FreqOutputSim 1 to n (0472–1 to n)

Prerequisite   In the **Operating mode** parameter (→ 🖺 127), 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 **Frequency 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.

Frequency value 1 to n	🔒

Navigation   🖩🖵 Expert → Diagnostics → Simulation → Freq value 1 to n (0473–1 to n)

Prerequisite   In the **Frequency output simulation 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

Pulse output simulation 1 to n ⌂

Navigation	🔳🔲 Expert → Diagnostics → Simulation → Puls.outp.sim. 1 to n (0458–1 to n)

Prerequisite   In the **Operating mode** parameter (→ 🖺 127), 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-counting value

Factory setting   Off

Additional information   *Description*

ℹ️ 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 (→ 🖺 129).
• Down-counting value
The pulses specified in the **Pulse value** parameter (→ 🖺 224) are output.

Pulse value 1 to n ⌂

Navigation	🔳🔲 Expert → Diagnostics → Simulation → Pulse value 1 to n (0459–1 to n)

Prerequisite   In the **Pulse output simulation 1 to n** parameter, the **Down-counting value** 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 output simulation 1 to n ⌂

Navigation	🔳🔲 Expert → Diagnostics → Simulation → Switch sim. 1 to n (0462–1 to n)

Prerequisite   In the **Operating mode** parameter (→ 🖺 127), 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 output 1 to n simulation   🔒

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   In the **Switch output simulation 1 to n** parameter, the **On** option is selected.

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.

Pulse output simulation	

Navigation   Expert → Diagnostics → Simulation → Puls.outp.sim. (0988)

Description   Use this function to switch simulation of the double pulse output on and off. The display
                         alternates between the measured value and a diagnostic message of the "Function check"
                         category (C) while simulation is in progress.

Selection   • Off
                         • Fixed value
                         • Down-counting value

Factory setting   Off

Additional information   *Description*

> The desired simulation value is defined in the **Pulse value** parameter (→ 🖹 227).

Selection

• Off
  Simulation of the double pulse output is switched off. The device is in normal measuring mode or another process variable is being simulated.
• Fixed value
  Pulses are continuously output with the pulse width specified in the **Pulse width** parameter (→ 🖹 158).
• Down-counting value
  The pulses specified in the **Pulse value** parameter (→ 🖹 227) are output.

Pulse value   🔒

Navigation   🔘🖳 Expert → Diagnostics → Simulation → Pulse value (0989)

Prerequisite   In the **Pulse output simulation** parameter (→ 🖹 226), the **Down-counting value** option is selected.

Description   Use this function to enter a pulse value for simulation of the double pulse output. In this way, users can verify the correct adjustment of the double pulse output and the correct function of downstream switching units.

User entry   0 to 65 535

Device alarm simulation   🔒

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.

Diagnostic 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 **Diagnostic event simulation** parameter (→ 🖺 228).
Selection	• Sensor • Electronics • Configuration • Process
Factory setting	Process

Diagnostic event simulation	🔒

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 **Diagnostic event category** parameter (→ 🖺 228).

4   Country-specific factory settings

4.1   SI units

ℹ️ 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	℃
Pressure	bar a

4.1.2   Full scale values

ℹ️ The factory settings applie to the following parameters:
- 20 mA value (full scale value of the current output)
- 100% bar graph value 1

📖 For detailed information about the full scale value for measuring devices for custody transfer, see the Special Documentation for the device → 🔖 8

Nominal diameter [mm]	[kg/h]
1	4
2	20
4	90
8	400
15	1300
15 FB	3600
25	3600
25 FB	9000
40	9000
40 FB	14000
50	14000
50 FB	36000
80	36000
100	60000
150	130 t/h
250	360 t/h
350	650 t/h

4.1.3   Output current span

Current output 1 to n	4 to 20 mA NAMUR

4.1.4   Pulse value

📖 For detailed information about the pulse value for measuring devices for custody transfer, see the Special Documentation for the device → 📘 8

Nominal diameter [mm]	[kg/p]
1	0.001
2	0.01
4	0.01
8	0.1
15	0.1
15 FB	1
25	1
25 FB	1
40	1
40 FB	10
50	10
50 FB	10
80	10
100	10
150	100
250	100
350	100

4.1.5   On value low flow cut off

ℹ️ The switch-on point depends on the type of medium and the nominal diameter.

Nominal diameter [mm]	On-value for liquid [kg/h]
1	0.08
2	0.4
4	1.8
8	8
15	26
15 FB	72
25	72
25 FB	180
40	180
40 FB	300
50	300
50 FB	720

Nominal diameter [mm]	On-value for liquid [kg/h]
80	720
100	1 200
150	2.6 t/h
250	7.2 t/h
350	13 t/h

Nominal diameter [mm]	Switch-on value for gas [kg/h]
1	0.02
2	0.1
4	0.45
8	2
15	6.5
15 FB	18
25	18
25 FB	45
40	45
40 FB	75
50	75
50 FB	180
80	180
100	300
150	650
250	1.8 t/h
350	3.25 t/h

4.2 US units

Only valid for USA and Canada.

4.2.1 System units

Mass	lb
Mass flow	lb/min
Volume	gal (us)
Volume flow	gal/min (us)
Corrected volume	Sft³
Corrected volume flow	Sft³/min
Density	lb/ft³
Reference density	lb/Sft³
Temperature	°F
Pressure	psi a

4.2.2 Full scale values

The factory settings applie to the following parameters:
- 20 mA value (full scale value of the current output)
- 100% bar graph value 1

For detailed information about the full scale value for measuring devices for custody transfer, see the Special Documentation for the device → 🖹 8

Nominal diameter [in]	[lb/min]
$^1/_{24}$	0.15
$^1/_{12}$	0.75
$^1/_8$	3.3
$^3/_8$	15
½	50
½ FB	130
1	130
1 FB	330
1½	330
1½ FB	550
2	550
2 FB	1300
3	1300
4	2200
6	4800
10	13000
14	23500

4.2.3 Output current span

Current output 1 to n	4 to 20 mA US

4.2.4 Pulse value

For detailed information about the pulse value for measuring devices for custody transfer, see the Special Documentation for the device → 🖹 8

Nominal diameter [in]	[lb/p]
$^1/_{24}$	0.002
$^1/_{12}$	0.02
$^1/_8$	0.02
$^3/_8$	0.2
½	0.2
½ FB	2
1	2
1 FB	2
1½	2

Nominal diameter [in]	[lb/p]
1½ FB	20
2	20
2 FB	20
3	20
4	20
6	200
10	200
14	200

4.2.5   On value low flow cut off

The switch-on point depends on the type of medium and the nominal diameter.

Nominal diameter [in]	On-value for liquid [lb/min]
$^1/_{24}$	0.003
$^1/_{12}$	0.015
$^1/_8$	0.066
$^3/_8$	0.3
½	1
½ FB	2.6
1	2.6
1 FB	6.6
1½	6.6
1½ FB	11
2	11
2 FB	26
3	26
4	44
6	95
10	260
14	470

Nominal diameter [in]	Switch-on value for gas [lb/min]
$^1/_{24}$	0.001
$^1/_{12}$	0.004
$^1/_8$	0.016
$^3/_8$	0.075
½	0.25
½ FB	0.65
1	0.65
1 FB	1.65

Nominal diameter [in]	Switch-on value for gas [lb/min]
1½	1.65
1½ FB	2.75
2	2.75
2 FB	6.5
3	6.5
4	11
6	23.75
10	65
14	117.5

5 Explanation of abbreviated units

5.1 SI units

Process variable	Units	Explanation
Density	g/cm³, g/m³	Gram/volume unit
	kg/dm³, kg/l, kg/m³	Kilogram/volume unit
	SD4℃, SD15℃, SD20℃	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 ℃ (39 ℉), 15 ℃ (59 ℉), 20 ℃ (68 ℉).
	SG4℃, SG15℃, SG20℃	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 ℃ (39 ℉), 15 ℃ (59 ℉), 20 ℃ (68 ℉).
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
Reference density	kg/Nm³, kg/Nl, g/Scm³, kg/Sm³	Kilogram, gram/standard volume unit
Corrected volume	Nl, Nm³, Sm³	Normal liter, normal cubic meter, standard cubic meter
Corrected volume flow	Nl/s, Nl/min, Nl/h, Nl/d	Normal liter/time unit
	Nm³/s, Nm³/min, Nm³/h, Nm³/d	Normal cubic meter/time unit
	Sm³/s, Sm³/min, Sm³/h, Sm³/d	Standard cubic meter/time unit
Temperature	℃ , K	Celsius, Kelvin
Volume	cm³, dm³, m³	Cubic centimeter, cubic decimeter, cubic meter
	ml, l, hl, Ml Mega	Milliliter, liter, hectoliter, megaliter
Volume flow	cm³/s, cm³/min, cm³/h, cm³/d	Cubic centimeter/time unit
	dm³/s, dm³/min, dm³/h, dm³/d	Cubic decimeter/time unit
	m³/s, m³/min, m³/h, m³/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/ft³, 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
Reference density	lb/Sft³	Weight unit/standard volume unit
Corrected volume	Sft³, Sgal (us), Sbbl (us;liq.)	Standard cubic foot, standard gallon, standard barrel
Corrected volume flow	Sft³/s, Sft³/min, Sft³/h, Sft³/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
	ft³	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
	ft³/s, ft³/min, ft³/h, ft³/d	Cubic foot/time unit
	fl oz/s (us), fl oz/min (us), fl oz/h (us), fl oz/d (us)	Fluid ounce/time unit
	gal/s (us), gal/min (us), gal/h (us), gal/d (us)	Gallon/time unit
	kgal/s (us), kgal/min (us), kgal/h (us), kgal/d (us)	Kilogallon/time unit
	Mgal/s (us), Mgal/min (us), Mgal/h (us), Mgal/d (us)	Million gallon/time unit
	bbl/s (us;liq.), bbl/min (us;liq.), bbl/h (us;liq.), bbl/d (us;liq.)	Barrel/time unit (normal liquids) Normal liquids: 31.5 gal/bbl
	bbl/s (us;beer), bbl/min (us;beer), bbl/h (us;beer), bbl/d (us;beer)	Barrel /time unit (beer) Beer: 31.0 gal/bbl
	bbl/s (us;oil), bbl/min (us;oil), bbl/h (us;oil), bbl/d (us;oil)	Barrel/time unit (petrochemicals) Petrochemicals: 42.0 gal/bbl
	bbl/s (us;tank), bbl/min (us;tank), bbl/h (us;tank), bbl/d (us;tank)	Barrel/time unit (filling tank) Filling tanks: 55.0 gal/bbl
Time	s, m, h, d, y	Second, minute, hour, day, year
	am, pm	Ante meridiem (before midday), post meridiem (after midday)

5.3   Imperial units

Process variable	Units	Explanation
Density	lb/gal (imp), lb/bbl (imp;beer), lb/bbl (imp;oil)	Pound/volume unit
Corrected volume	Sgal (imp)	Standard gallon
Corrected volume 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)

6 Modbus RS485 Register Information

6.1 Notes

6.1.1 Structure of the register information

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

Navigation: navigation path to the parameter					
Parameter	Register	Data type	Access type	Selection/input	→ 📄
Name of parameter	Indicated in decimal numerical format	• Float length = 4 byte • Integer length = 2 byte • String length, depending on parameter	Possible type of access to parameter: • Read access via function codes 03, 04 or 23 • Write access via function codes 06, 16 or 23	**Selection** List of the individual options for the parameter • Option 1 • **Option 2** • **Option 3** (+) ℹ️ • Factory setting highlighted in bold • (+) = Factory setting depends on country, order options or device settings **User entry** Input range for the parameter	Specified number of pages and cross-reference to standard parameter description

> **NOTICE**
>
> **If non-volatile device parameters are modified via the MODBUS RS485 function codes 06, 16 or 23, the change is saved in the EEPROM of the measuring device.**
> The number of writes to the EEPROM is technically restricted to a maximum of 1 million.
> ▸ Make sure to comply with this limit since, if it is exceeded, data loss and measuring device failure will result.
> ▸ Avoid constantly writing non-volatile device parameters via the MODBUS RS485.

6.1.2 Address model

The Modbus RS485 register addresses of the measuring device are implemented in accordance with the "Modbus Applications Protocol Specification V1.1".

In addition, systems are used that work with the register address model "Modicon Modbus Protocol Reference Guide (PI-MBUS-300 Rev. J)".

Depending on the function code used, a number is added at the start of the register address with this specification:
• "3" → "Read" access
• "4" → "Write" access

Function code	Access type	Register in accordance with "Modbus Applications Protocol Specification"	Register in accordance with "Modicon Modbus Protocol Reference Guide"
03 04 23	Read	XXXX Example: mass flow = 2007	3XXXX Example: mass flow = 32007
06 16 23	Write	XXXX Example: reset totalizer = 6401	4XXXX Example: reset totalizer = 46401

6.2 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)	→ 🗎 253
Locking status (0004)	→ 🗎 253
Access status (0005)	→ 🗎 253
Enter access code (0003)	→ 🗎 253
► System	→ 🗎 253
► Display	→ 🗎 253
Display language (0104)	→ 🗎 253
Format display (0098)	→ 🗎 253
Value 1 display (0107)	→ 🗎 254
0% bargraph value 1 (0123)	→ 🗎 254
100% bargraph value 1 (0125)	→ 🗎 254
Decimal places 1 (0095)	→ 🗎 254
Value 2 display (0108)	→ 🗎 255
Decimal places 2 (0117)	→ 🗎 255
Value 3 display (0110)	→ 🗎 255
0% bargraph value 3 (0124)	→ 🗎 255
100% bargraph value 3 (0126)	→ 🗎 255

Status input simulation (1355)	→ 🕮 288
Input signal level (1356)	→ 🕮 288
Current input 1 to n simulation (1608–1 to n)	→ 🕮 288
Value current input 1 to n (1609–1 to n)	→ 🕮 288
Current output 1 to n simulation (0354–1 to n)	→ 🕮 288
Value current output 1 to n (0355–1 to n)	→ 🕮 288
Frequency output simulation 1 to n (0472–1 to n)	→ 🕮 288
Frequency value 1 to n (0473–1 to n)	→ 🕮 288
Pulse output simulation 1 to n (0458–1 to n)	→ 🕮 288
Pulse value 1 to n (0459–1 to n)	→ 🕮 288
Switch output simulation 1 to n (0462–1 to n)	→ 🕮 288
Switch status 1 to n (0463–1 to n)	→ 🕮 288
Relay output 1 to n simulation (0802–1 to n)	→ 🕮 288
Switch status 1 to n (0803–1 to n)	→ 🕮 289
Pulse output simulation (0988)	→ 🕮 289
Pulse value (0989)	→ 🕮 289
Device alarm simulation (0654)	→ 🕮 289
Diagnostic event category (0738)	→ 🕮 289
Diagnostic event simulation (0737)	→ 🕮 289

6.3   Register information

Navigation: Expert					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗐
Direct access (0106)	3878	Integer	Read / Write	0 to 65 535	12
Locking status (0004)	4918	Integer	Read	256 = Hardware locked 512 = Temporarily locked 2048 = CT active - all parameters 32768 = CT active - defined parameters	13
Access status (0005)	2178	Integer	Read	0 = Operator **1 = Maintenance**	14
Enter access code (0003)	2177	Integer	Read / Write	0 to 9999	14

6.3.1   "System" submenu

"Display" submenu

Navigation: Expert → System → Display					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗐
Display language (0104)	3673	Integer	Read / Write	0 = English 1 = Deutsch [*] 2 = Français [*] 3 = Español [*] 4 = Italiano [*] 5 = Nederlands [*] 8 = Svenska [*] 10 = Bahasa Indonesia [*] 11 = 日本語 (Japanese) [*] 12 = Portuguesa [*] 13 = Polski [*] 14 = русский язык (Russian) [*] 15 = čeština (Czech) [*] 16 = 中文 (Chinese) [*] 18 = Türkçe [*] 19 = tiếng Việt (Vietnamese) [*] 20 = 한국어 (Korean) [*]	16
Format display (0098)	3625	Integer	Read / Write	**0 = 1 value, max. size** 1 = 1 bargraph + 1 value 2 = 2 values 3 = 1 value large + 2 values 4 = 4 values	17

Navigation: Expert → System → Display					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Value 1 display (0107)	3963	Integer	Read / Write	**1 = Mass flow** 2 = Volume flow 3 = Corrected volume flow 4 = Density 5 = Reference density 6 = Oscillation amplitude 1 * 7 = Temperature 8 = Oscillation amplitude 0 * 9 = Signal asymmetry 16 = Totalizer 1 17 = Totalizer 2 18 = HBSI * 18 = Totalizer 3 23 = Carrier pipe temperature * 31 = Oscillation damping fluctuation 1 * 32 = Exciter current 0 33 = Exciter current 1 * 39 = Electronic temperature 45 = Kinematic viscosity * 46 = Dynamic viscosity * 48 = Oscillation frequency 0 50 = Oscillation frequency 1 * 52 = Frequency fluctuation 1 * 63 = Oscillation damping 0 64 = Oscillation damping 1 * 67 = Oscillation damping fluctuation 0 68 = Frequency fluctuation 0 73 = Concentration * 74 = Target mass flow * 75 = Carrier mass flow * 76 = Temp. compensated dynamic viscosity * 77 = Temp. compensated kinematic viscosity * 121 = Current output 1 122 = Current output 2 * 123 = Current output 3 *	19
0% bargraph value 1 (0123)	4136	Float	Read / Write	Signed floating-point number	20
100% bargraph value 1 (0125)	4142	Float	Read / Write	Signed floating-point number	21
Decimal places 1 (0095)	3365	Integer	Read / Write	0 = x 1 = x.x **2 = x.xx** 3 = x.xxx 4 = x.xxxx	21

Navigation: Expert → System → Display					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Value 2 display (0108)	3964	Integer	Read / Write	1 = Mass flow 2 = Volume flow 3 = Corrected volume flow 4 = Density 5 = Reference density 6 = Oscillation amplitude 1 * 7 = Temperature 8 = Oscillation amplitude 0 * 9 = Signal asymmetry 16 = Totalizer 1 17 = Totalizer 2 18 = HBSI * 18 = Totalizer 3 23 = Carrier pipe temperature * 31 = Oscillation damping fluctuation 1 * 32 = Exciter current 0 33 = Exciter current 1 * 39 = Electronic temperature 45 = Kinematic viscosity * 46 = Dynamic viscosity * 48 = Oscillation frequency 0 50 = Oscillation frequency 1 * 52 = Frequency fluctuation 1 * 63 = Oscillation damping 0 64 = Oscillation damping 1 * 67 = Oscillation damping fluctuation 0 68 = Frequency fluctuation 0 73 = Concentration * 74 = Target mass flow * 75 = Carrier mass flow * 76 = Temp. compensated dynamic viscosity * 77 = Temp. compensated kinematic viscosity * 100 = Custody transfer counter * 121 = Current output 1 122 = Current output 2 * 123 = Current output 3 * **251 = None**	22
Decimal places 2 (0117)	4049	Integer	Read / Write	0 = x 1 = x.x **2 = x.xx** 3 = x.xxx 4 = x.xxxx	23
Value 3 display (0110)	3966	Integer	Read / Write	For the picklist, see the **Value 2 display** parameter (→ 🖺 22)	23
0% bargraph value 3 (0124)	4138	Float	Read / Write	Signed floating-point number	24
100% bargraph value 3 (0126)	4140	Float	Read / Write	Signed floating-point number	24
Decimal places 3 (0118)	4050	Integer	Read / Write	0 = x 1 = x.x **2 = x.xx** 3 = x.xxx 4 = x.xxxx	25
Value 4 display (0109)	3965	Integer	Read / Write	For the picklist, see the **Value 2 display** parameter (→ 🖺 22)	25
Decimal places 4 (0119)	4051	Integer	Read / Write	0 = x 1 = x.x **2 = x.xx** 3 = x.xxx 4 = x.xxxx	26
Display interval (0096)	3604	Float	Read / Write	1 to 10 s	26

Navigation: Expert → System → Display					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗎
Display damping (0094)	3554	Float	Read / Write	0.0 to 999.9 s	27
Header (0097)	3624	Integer	Read / Write	**0 = Device tag** 1 = Free text	27
Header text (0112)	3968	String	Read / Write	Max. 12 characters such as letters, numbers or special characters (e.g. @, %, /)	28
Separator (0101)	3671	Integer	Read / Write	▪ . (point) ▪ , (comma)	29
Contrast display (0105)	3674	Float	Read / Write	20 to 80 %	29
Backlight (0111)	3967	Integer	Read / Write	0 = Disable **1 = Enable**	29

*   Visibility depends on order options or device settings

"Configuration backup" submenu

Navigation: Expert → System → Configuration backup					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗎
Operating time (0652)	2631	Integer	Read	Days (d), hours (h), minutes (m) and seconds (s)	30
Last backup (2757)	6430	Integer	Read	Days (d), hours (h), minutes (m) and seconds (s)	30
Configuration management (2758)	5500	Integer	Read / Write	**0 = Cancel** 1 = Execute backup 2 = Restore 4 = Clear backup data 5 = Compare	30
Backup state (2759)	5502	Integer	Read	1 = Backup in progress 2 = Restoring in progress 4 = Delete in progress 5 = Compare in progress 6 = Restoring failed 7 = Backup failed **251 = None**	31
Comparison result (2760)	5514	Integer	Read	0 = Settings identical 1 = Settings not identical 2 = No backup available **3 = Check not done** 4 = Backup settings corrupt 5 = Dataset incompatible	32

"Diagnostic handling" submenu

Navigation: Expert → System → Diagnostic handling					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗎
Alarm delay (0651)	6808	Float	Read / Write	0 to 60 s	33

"Diagnostic behavior" submenu

Navigation: Expert → System → Diagnostic handling → Diagnostic behavior					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📄
Assign behavior of diagnostic no. 046 (0709)	2756	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	35
Assign behavior of diagnostic no. 140 (0708)	2757	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	36
Assign behavior of diagnostic no. 144 (0731)	2081	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning **3 = Alarm**	36
Assign behavior of diagnostic no. 374 (0710)	2755	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	36
Assign behavior of diagnostic no. 441 (0657)	4742	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	37
Assign behavior of diagnostic no. 442 (0658)	4919	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	37
Assign behavior of diagnostic no. 443 (0659)	5000	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	37
Assign behavior of diagnostic no. 444 (0740)	5120	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	38
Assign behavior of diagnostic no. 543 (0643)	2362	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	38
Assign behavior of diagnostic no. 830 (0800)	6805	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning **3 = Alarm**	38
Assign behavior of diagnostic no. 831 (0641)	6806	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning **3 = Alarm**	39
Assign behavior of diagnostic no. 832 (0681)	2759	Integer	Read / Write	0 = Off **1 = Logbook entry only** 2 = Warning 3 = Alarm	39
Assign behavior of diagnostic no. 833 (0682)	2762	Integer	Read / Write	0 = Off **1 = Logbook entry only** 2 = Warning 3 = Alarm	40
Assign behavior of diagnostic no. 834 (0700)	2761	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	40

Navigation: Expert → System → Diagnostic handling → Diagnostic behavior					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📖
Assign behavior of diagnostic no. 835 (0702)	2760	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	40
Assign behavior of diagnostic no. 862 (0679)	6441	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	41
Assign behavior of diagnostic no. 912 (0703)	2758	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	41
Assign behavior of diagnostic no. 913 (0712)	2754	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	41
Assign behavior of diagnostic no. 944 (0732)	2082	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	42
Assign behavior of diagnostic no. 948 (0744)	5179	Integer	Read / Write	0 = Off 1 = Logbook entry only **2 = Warning** 3 = Alarm	42

"Administration" submenu

Navigation: Expert → System → Administration					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📖
Device reset (0000)	6817	Integer	Read / Write	**0 = Cancel** 1 = Restart device 2 = To delivery settings 5 = Delete powerfail data 21 = Delete T-DAT 22 = Reset faulty parameters 23 = Delete factory data 24 = Delete embedded HistoROM 25 = Restore S-DAT backup	45
Activate SW option (0029)	2795	Integer	Read / Write	Max. 10-digit string consisting of numbers.	45
Software option overview (0015)	2902	Integer	Read	1 = Extended HistoROM 4 = Concentration 64 = Viscosity 128 = Custody transfer 16384 = Heartbeat Monitoring 32768 = Heartbeat Verification	46

"Define access code" wizard

Navigation: Expert → System → Administration → Define access code					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Define access code	8677	String	Read / Write	Max. 16-digit character string comprising numbers, letters and special characters	43
Confirm access code	8685	String	Read / Write	Max. 16-digit character string comprising numbers, letters and special characters	44

"Reset access code" submenu

Navigation: Expert → System → Administration → Reset access code					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Operating time (0652)	2631	Integer	Read	Days (d), hours (h), minutes (m) and seconds (s)	44
Reset access code (0024)	8880	String	Read / Write	Character string comprising numbers, letters and special characters	44

6.3.2 "Sensor" submenu

"Measured values" submenu

"Process variables" submenu

Navigation: Expert → Sensor → Measured values → Process variables					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Mass flow (1838)	2007	Float	Read	Signed floating-point number	49
Volume flow (1847)	2009	Float	Read	Signed floating-point number	49
Corrected volume flow (1851)	2011	Float	Read	Signed floating-point number	49
Density (1850)	2013	Float	Read	Signed floating-point number	49
Reference density (1852)	2015	Float	Read	Signed floating-point number	50
Temperature (1853)	2017	Float	Read	Signed floating-point number	50
Pressure value (6129)	2089	Float	Read	Signed floating-point number	50
Dynamic viscosity (1854)	2019	Float	Read	Signed floating-point number	51
Kinematic viscosity (1857)	2083	Float	Read	Signed floating-point number	51
Temp. compensated dynamic viscosity (1872)	2093	Float	Read	Signed floating-point number	51
Temp. compensated kinematic viscosity (1863)	2095	Float	Read	Signed floating-point number	52
Concentration (1887)	2598	Float	Read	Signed floating-point number	52
Target mass flow (1864)	2797	Float	Read	Signed floating-point number	53
Carrier mass flow (1865)	2799	Float	Read	Signed floating-point number	53

"Totalizer" submenu

Navigation: Expert → Sensor → Measured values → Totalizer					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📖
Totalizer value 1 to n (0911–1 to n)	1: 2610 2: 2810 3: 3010	Float	Read	Signed floating-point number	54
Totalizer overflow 1 to n (0910–1 to n)	1: 2612 2: 2812 3: 3012	Float	Read	Integer with sign	55

"Input values" submenu

"Current input 1 to n" submenu

Navigation: Expert → Sensor → Measured values → Input values → Current input 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📖
Measured values 1 to n (1603–1 to n)	1: 6151 2: 6153 3: 6155	Float	Read	Signed floating-point number	56
Measured current 1 to n (1604–1 to n)	1: 6131 2: 6133 3: 6135	Float	Read	0 to 22.5 mA	56

"Value status input 1 to n" submenu

Navigation: Expert → Sensor → Measured values → Input values → Value status input 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📖
Value status input (1353–1 to n)	1: 2746 2: 4699 3: 4700	Integer	Read	0 = Low 1 = High	57

"Output values" submenu

"Value current output 1 to n" submenu

Navigation: Expert → Sensor → Measured values → Output values → Value current output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📖
Output current 1 to n (0361–1 to n)	1: 5931 2: 5933 3: 5935	Float	Read	0 to 22.5 mA	57
Measured current 1 to n (0366–1 to n)	1: 5779 2: 5781 3: 5783	Float	Read	0 to 30 mA	58

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

Navigation: Expert → Sensor → Measured values → Output values → Pulse/frequency/switch output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🕮
Output frequency 1 to n (0471–1 to n)	1: 3462 2: 3464 3: 9910	Float	Read	0.0 to 12 500.0 Hz	58
Value per pulse (0455–1 to n)	1: 3034 2: 3036 3: 4714	Float	Read / Write	Signed floating-point number	59
Switch status 1 to n (0461–1 to n)	1: 2485 2: 2486 3: 9917	Integer	Read	1 = Open 2 = Closed	59

"Relay output 1 to n" submenu

Navigation: Expert → Sensor → Measured values → Output values → Relay output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🕮
Switch status (0801–1 to n)	1: 3518 2: 3519 3: 9875	Integer	Read	1 = Open 2 = Closed	60
Switch cycles (0815–1 to n)	1: 7625 2: 7627 3: 7629	Integer	Read	Positive integer	60
Max. switch cycles number (0817–1 to n)	1: 21919 2: 21921 3: 21923	Integer	Read	Positive integer	60

"Double pulse output" submenu

Navigation: Expert → Sensor → Measured values → Output values → Double pulse output					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🕮
Pulse output (0987)	7041	Float	Read	Positive floating-point number	61

"System units" submenu

Navigation: Expert → Sensor → System units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📖
Mass flow unit (0554)	2101	Integer	Read / Write	0 = g/s 1 = g/min 2 = g/h 3 = g/d 4 = kg/s 5 = kg/min **6 = kg/h** [(+)] 7 = kg/d 8 = t/s 9 = t/min 10 = t/h 11 = t/d 12 = oz/s 13 = oz/min 14 = oz/h 15 = oz/d 16 = lb/s 17 = lb/min 18 = lb/h 19 = lb/d 20 = STon/s 21 = STon/min 22 = STon/h 23 = STon/d 24 = User mass/s 25 = User mass/min 26 = User mass/h 27 = User mass/d	62
Mass unit (0574)	2102	Integer	Read / Write	50 = g **51 = kg** [(+)] 52 = t 53 = oz 54 = lb 55 = STon 56 = User mass	63

Navigation: Expert → Sensor → System units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📄
Volume flow unit (0553)	2103	Integer	Read / Write	0 = cm³/s 1 = cm³/min 2 = cm³/h 3 = cm³/d 4 = dm³/s 5 = dm³/min 6 = dm³/h 7 = dm³/d 8 = m³/s 9 = m³/min 10 = m³/h 11 = m³/d 12 = ml/s 13 = ml/min 14 = ml/h 15 = ml/d 16 = l/s 17 = l/min **18 = l/h** **(+)** 19 = l/d 20 = hl/s 21 = hl/min 22 = hl/h 23 = hl/d 24 = Ml/s 25 = Ml/min 26 = Ml/h 27 = Ml/d 32 = af/s 33 = af/min 34 = af/h 35 = af/d 36 = ft³/s 37 = ft³/min 38 = ft³/h 39 = ft³/d 40 = fl oz/s (us) 41 = fl oz/min (us) 42 = fl oz/h (us) 43 = fl oz/d (us) 44 = gal/s (us) 45 = gal/min (us) 46 = gal/h (us) 47 = gal/d (us) 48 = Mgal/s (us) 49 = Mgal/min (us) 50 = Mgal/h (us) 51 = Mgal/d (us) 52 = bbl/s (us;liq.) 53 = bbl/min (us;liq.) 54 = bbl/h (us;liq.) 55 = bbl/d (us;liq.) 56 = bbl/s (us;beer) 57 = bbl/min (us;beer) 58 = bbl/h (us;beer) 59 = bbl/d (us;beer) 60 = bbl/s (us;oil) 61 = bbl/min (us;oil) 62 = bbl/h (us;oil) 63 = bbl/d (us;oil) 64 = bbl/s (us;tank) 65 = bbl/min (us;tank) 66 = bbl/h (us;tank) 67 = bbl/d (us;tank) 68 = gal/s (imp) 69 = gal/min (imp) 70 = gal/h (imp)	63

Navigation: Expert → Sensor → System units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖹
				71 = gal/d (imp) 72 = Mgal/s (imp) 73 = Mgal/min (imp) 74 = Mgal/h (imp) 75 = Mgal/d (imp) 76 = bbl/s (imp;beer) 77 = bbl/min (imp;beer) 78 = bbl/h (imp;beer) 79 = bbl/d (imp;beer) 80 = bbl/s (imp;oil) 81 = bbl/min (imp;oil) 82 = bbl/h (imp;oil) 83 = bbl/d (imp;oil) 84 = User vol./s 85 = User vol./min 86 = User vol./h 87 = User vol./d 88 = kgal/s (us) 89 = kgal/min (us) 90 = kgal/h (us) 91 = kgal/d (us)	
Volume unit (0563)	2104	Integer	Read / Write	0 = cm³ 1 = dm³ 2 = m³ 3 = ml **4 = l** [(+)] 5 = hl 6 = Ml Mega 8 = af 9 = ft³ 10 = fl oz (us) 11 = gal (us) 12 = Mgal (us) 13 = bbl (us;liq.) 14 = bbl (us;beer) 15 = bbl (us;oil) 16 = bbl (us;tank) 17 = gal (imp) 18 = Mgal (imp) 19 = bbl (imp;beer) 20 = bbl (imp;oil) 21 = User vol. 22 = kgal (us)	65

Navigation: Expert → Sensor → System units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Corrected volume flow unit (0558)	2105	Integer	Read / Write	0 = Nl/s 1 = Nl/min **2 = Nl/h** [(+)] 3 = Nl/d 4 = Nm³/s 5 = Nm³/min 6 = Nm³/h 7 = Nm³/d 8 = Sm³/s 9 = Sm³/min 10 = Sm³/h 11 = Sm³/d 12 = Sft³/s 13 = Sft³/min 14 = Sft³/h 15 = Sft³/d 16 = Sgal/s (us) 17 = Sgal/min (us) 18 = Sgal/h (us) 19 = Sgal/d (us) 20 = Sbbl/s (us;liq.) 21 = Sbbl/min (us;liq.) 22 = Sbbl/h (us;liq.) 23 = Sbbl/d (us;liq.) 24 = Sgal/s (imp) 25 = Sgal/min (imp) 26 = Sgal/h (imp) 27 = Sgal/d (imp) 28 = UserCrVol./s 29 = UserCrVol./min 30 = UserCrVol./h 31 = UserCrVol./d	65
Corrected volume unit (0575)	2106	Integer	Read / Write	**100 = Nl** [(+)] 101 = Nm³ 102 = Sm³ 103 = Sft³ 105 = Sgal (us) 106 = Sbbl (us;liq.) 107 = Sgal (imp) 108 = UserCrVol.	66
Density unit (0555)	2107	Integer	Read / Write	0 = g/cm³ 2 = kg/dm³ **3 = kg/l** [(+)] 4 = kg/m³ 5 = SD4℃ 6 = SD15℃ 7 = SD20℃ 8 = SG4℃ 9 = SG15℃ 10 = SG20℃ 11 = lb/ft³ 12 = lb/gal (us) 13 = lb/bbl (us;liq.) 14 = lb/bbl (us;beer) 15 = lb/bbl (us;oil) 16 = lb/bbl (us;tank) 17 = lb/gal (imp) 18 = lb/bbl (imp;beer) 19 = lb/bbl (imp;oil) 20 = User dens. 21 = g/m³	67

Navigation: Expert → Sensor → System units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🕮
Reference density unit (0556)	2108	Integer	Read / Write	0 = g/Scm³ **1 = kg/Nl** [+] 2 = kg/Nm³ 3 = kg/Sm³ 4 = lb/Sft³	67
Temperature unit (0557)	2109	Integer	Read / Write	**0 = ℃** [+] 1 = K 2 = ℉ 3 = ℝ	68
Pressure unit (0564)	2130	Integer	Read / Write	0 = bar 1 = psi a 2 = bar g 3 = psi g 4 = Pa a 5 = kPa a 6 = MPa a 7 = Pa g 8 = kPa g 9 = MPa g 10 = User pres.	69
Date/time format (2812)	2150	Integer	Read / Write	**0 = dd.mm.yy hh:mm** 1 = mm/dd/yy hh:mm am/pm 2 = dd.mm.yy hh:mm am/pm 3 = mm/dd/yy hh:mm	69

"User-specific units" submenu

Navigation: Expert → Sensor → System units → User-specific units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🕮
User mass text (0560)	2531	String	Read / Write	Max. 10 characters such as letters, numbers or special characters (@, %, /)	70
User mass factor (0561)	2115	Float	Read / Write	Signed floating-point number	71
User mass offset (0562)	4339	Float	Read / Write	Signed floating-point number	71
User volume text (0567)	2542	String	Read / Write	Max. 10 characters such as letters, numbers or special characters (@, %, /)	72
User volume factor (0568)	2119	Float	Read / Write	Signed floating-point number	72
User corrected volume text (0592)	2568	String	Read / Write	Max. 10 characters such as letters, numbers or special characters (@, %, /)	73
User corrected volume factor (0590)	2573	Float	Read / Write	Signed floating-point number	73
User corrected volume offset (0602)	4662	Float	Read / Write	Signed floating-point number	74
User volume offset (0569)	2528	Float	Read / Write	Signed floating-point number	72
User density text (0570)	2549	String	Read / Write	Max. 10 characters such as letters, numbers or special characters (@, %, /)	74
User density factor (0572)	2123	Float	Read / Write	Signed floating-point number	74
User density offset (0571)	2556	Float	Read / Write	Signed floating-point number	75
User pressure text (0581)	2559	String	Read / Write	Max. 10 characters such as letters, numbers or special characters (@, %, /)	75
User pressure factor (0579)	2564	Float	Read / Write	Signed floating-point number	75
User pressure offset (0580)	2566	Float	Read / Write	Signed floating-point number	75

"Process parameters" submenu

Navigation: Expert → Sensor → Process parameters					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→ 🗎**
Flow damping (1802)	5510	Float	Read / Write	0 to 100.0 s	76
Density damping (1803)	5508	Float	Read / Write	0 to 999.9 s	77
Temperature damping (1822)	5127	Float	Read / Write	0 to 999.9 s	77
Flow override (1839)	5503	Integer	Read / Write	**0 = Off** 1 = On	78

"Low flow cut off" submenu

Navigation: Expert → Sensor → Process parameters → Low flow cut off					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→ 🗎**
Assign process variable (1837)	5101	Integer	Read / Write	0 = Off **1 = Mass flow** 2 = Volume flow 3 = Corrected volume flow	79
On value low flow cutoff (1805)	5138	Float	Read / Write	Positive floating-point number	79
Off value low flow cutoff (1804)	5104	Float	Read / Write	0 to 100.0 %	80
Pressure shock suppression (1806)	5140	Float	Read / Write	0 to 100 s	80

"Partially filled pipe detection" submenu

Navigation: Expert → Sensor → Process parameters → Partially filled pipe detection					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→ 🗎**
Assign process variable (1860)	5106	Integer	Read / Write	**0 = Off** 4 = Density 5 = Reference density	82
Low value partial filled pipe detection (1861)	5110	Float	Read / Write	Signed floating-point number	82
High value partial filled pipe detection (1858)	5112	Float	Read / Write	Signed floating-point number	83
Response time part. filled pipe detect. (1859)	5108	Float	Read / Write	0 to 100 s	83
Maximum damping partial filled pipe det. (6040)	2414	Float	Read / Write	Positive floating-point number	84

"Measurement mode" submenu

Navigation: Expert → Sensor → Measurement mode					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖹
Select medium (6062)	2442	Integer	Read / Write	**0 = Liquid** 1 = Gas	85
Select gas type (6074)	5229	Integer	Read / Write	0 = Air 1 = Nitrogen N2 2 = Argon Ar 3 = Helium He 4 = Carbon dioxide CO2 5 = Oxygen O2 **6 = Methane CH4** 7 = Ammonia NH3 9 = Hydrogen H2 10 = Ethane C2H6 11 = Propane C3H8 12 = Butane C4H10 13 = Chlorine Cl2 14 = Hydrogen chloride HCl 15 = Carbon monoxide CO 16 = Nitrous oxide N2O 17 = Nitrogen oxide NOx 18 = Hydrogen sulfide H2S 19 = Sulfur hexafluoride SF6 20 = Propylene C3H6 21 = Ozone O3 22 = Others 23 = Ethylene C2H4	85
Reference sound velocity (6147)	7413	Float	Read / Write	1 to 99 999.9999 m/s	86
Temperature coefficient sound velocity (6181)	7411	Float	Read / Write	Positive floating-point number	86

"External compensation" submenu

Navigation: Expert → Sensor → External compensation					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖹
Pressure compensation (6130)	5184	Integer	Read / Write	**0 = Off** 1 = Fixed value 2 = External value 11 = Current input 1 [*] 12 = Current input 2 [*] 13 = Current input 3 [*]	87
Pressure value (6059)	5185	Float	Read / Write	Positive floating-point number	87
External pressure (6209)	2440	Float	Read / Write	Positive floating-point number	87
Temperature mode (6184)	5515	Integer	Read / Write	**0 = Internal measured value** 1 = External value 11 = Current input 1 [*] 12 = Current input 2 [*] 13 = Current input 3 [*]	88
External temperature (6080)	2507	Float	Read / Write	−273.15 to 99 999 ℃	88

*   Visibility depends on order options or device settings

"Calculated values" submenu

"Corrected volume flow calculation" submenu

Navigation: Expert → Sensor → Calculated values → Corrected volume flow calculation					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Corrected volume flow calculation (1812)	5129	Integer	Read / Write	**0 = Calculated reference density** 1 = Fixed reference density 3 = Reference density by API table 53 11 = Current input 1 * 12 = Current input 2 * 13 = Current input 3 *	89
External reference density (6198)	2509	Float	Read / Write	Floating point number with sign	90
Fixed reference density (1814)	5130	Float	Read / Write	Positive floating-point number	90
Reference temperature (1816)	5136	Float	Read / Write	−273.15 to 99 999 ℃	90
Linear expansion coefficient (1817)	5132	Float	Read / Write	Signed floating-point number	91
Square expansion coefficient (1818)	5134	Float	Read / Write	Signed floating-point number	91

*   Visibility depends on order options or device settings

"Sensor adjustment" submenu

Navigation: Expert → Sensor → Sensor adjustment					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Installation direction (1809)	5501	Integer	Read / Write	**0 = Flow in arrow direction** 1 = Flow against arrow direction	92
Installation angle roll (6282)	2660	Float	Read / Write	−180 to 180 ˚	92
Installation angle pitch (6236)	6529	Float	Read / Write	−180 to 180 ˚	93

"Zero point adjustment" wizard

Navigation: Expert → Sensor → Sensor adjustment → Zero point adjustment					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Zero point adjustment control (6196)	5121	Integer	Read / Write	**0 = Cancel** 1 = Start 2 = Zero point adjust failure 8 = Busy	93
Progress (2808)	6797	Integer	Read	0 to 100 %	94

"Process variable adjustment" submenu

Navigation: Expert → Sensor → Sensor adjustment → Process variable adjustment					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Mass flow offset (1831)	5521	Float	Read / Write	Signed floating-point number	95
Mass flow factor (1832)	5519	Float	Read / Write	Positive floating-point number	95
Volume flow offset (1841)	5525	Float	Read / Write	Signed floating-point number	95
Volume flow factor (1846)	5523	Float	Read / Write	Positive floating-point number	96
Density offset (1848)	5529	Float	Read / Write	Signed floating-point number	96
Density factor (1849)	5527	Float	Read / Write	Positive floating-point number	96
Corrected volume flow offset (1866)	2044	Float	Read / Write	Signed floating-point number	97

Navigation: Expert → Sensor → Sensor adjustment → Process variable adjustment					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Corrected volume flow factor (1867)	2076	Float	Read / Write	Positive floating-point number	97
Reference density offset (1868)	2046	Float	Read / Write	Signed floating-point number	97
Reference density factor (1869)	2042	Float	Read / Write	Positive floating-point number	98
Temperature offset (1870)	5533	Float	Read / Write	Signed floating-point number	98
Temperature factor (1871)	5531	Float	Read / Write	Positive floating-point number	98

"Calibration" submenu

Navigation: Expert → Sensor → Calibration					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Calibration factor (6025)	7513	Float	Read	Signed floating-point number	99
Zero point (6195)	7527	Float	Read / Write	Signed floating-point number	99
Nominal diameter (2807)	2048	String	Read	DNxx / x"	100
C0 to 5 (6022)	0: 7501 1: 7503 2: 7505 3: 7507 4: 7509 5: 7511	Float	Read	Signed floating-point number	100

6.3.3   "I/O configuration" submenu

Navigation: Expert → I/O configuration					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
I/O module 1 to n terminal numbers (3902–1 to n)	1: 6541 2: 6542 3: 6543 4: 6544	Integer	Read	0 = Not used 1 = 26-27 (I/O 1) 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3) 4 = 20-21 (I/O 4) [*]	101
I/O module 1 to n information (3906–1 to n)	1: 8659 2: 8660 3: 8661 4: 8662	Integer	Read	1 = Fieldbus 2 = Configurable 3 = Not configurable 254 = Not plugged 255 = Invalid	101
I/O module 1 to n type (3901–1 to n)	1: 6417 2: 6418 3: 6419 4: 6420	Integer	Read / Write	**0 = Off** 0 = Current output [*] 0 = Current input [*] 0 = Status input [*] 0 = Pulse/frequency/switch output [*]	102
Apply I/O configuration (3907)	8665	Integer	Read / Write	0 = Yes **1 = No**	102
Conversion code (2762)	6427	Integer	Read / Write	Positive integer	102

*   Visibility depends on order options or device settings

6.3.4   "Input" submenu

"Current input 1 to n" submenu

Navigation: Expert → Input → Current input 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Terminal number (1611–1 to n)	1: 6548 2: 6549 3: 6550	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3) 4 = 20-21 (I/O 4) *	103
Signal mode (1610–1 to n)	1: 6424 2: 6425 3: 6426	Integer	Read / Write	**0 = Passive** 2 = Active	104
Current span (1605–1 to n)	1: 6147 2: 6148 3: 6149	Integer	Read / Write	0 = 4...20 mA 1 = 4...20 mA US **2 = 4...20 mA NAMUR** (+) 3 = 0...20 mA	104
0/4 mA value (1606–1 to n)	1: 6111 2: 6113 3: 6115	Float	Read / Write	Signed floating-point number	104
20 mA value (1607–1 to n)	1: 6119 2: 6121 3: 6123	Float	Read / Write	Signed floating-point number	105
Failure mode (1601–1 to n)	1: 6159 2: 6160 3: 6161	Integer	Read / Write	1 = Last valid value **2 = Alarm** 6 = Defined value	105
Failure value (1602–1 to n)	1: 6163 2: 6165 3: 6167	Float	Read / Write	Signed floating-point number	106

*   Visibility depends on order options or device settings

"Status input 1 to n" submenu

Navigation: Expert → Input → Status input 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Terminal number (1358–1 to n)	1: 6554 2: 6555 3: 6556	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3) 4 = 20-21 (I/O 4) *	106
Assign status input (1352–1 to n)	1: 2506 2: 4687 3: 4688	Integer	Read / Write	**0 = Off** 1 = Flow override 2 = Reset all totalizers 3 = Reset totalizer 1 4 = Reset totalizer 2 5 = Reset totalizer 3	107
Value status input (1353–1 to n)	1: 2746 2: 4699 3: 4700	Integer	Read	0 = Low 1 = High	107
Active level (1351–1 to n)	1: 2530 2: 4690 3: 4691	Integer	Read / Write	0 = Low **1 = High**	108
Response time status input (1354–1 to n)	1: 3404 2: 5753 3: 5755	Float	Read / Write	5 to 200 ms	108

*   Visibility depends on order options or device settings

6.3.5   "Output" submenu

"Current output 1 to n" submenu

Navigation: Expert → Output → Current output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📖
Terminal number (0379–1 to n)	1: 6545 2: 6546 3: 6547	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3) 4 = 20-21 (I/O 4) *	109
Signal mode (0377–1 to n)	1: 6421 2: 6422 3: 6423	Integer	Read / Write	**0 = Passive** 2 = Active	110
Assign current output 1 to n (0359–1 to n)	1: 5927 2: 5928 3: 5929	Integer	Read / Write	0 = Off **1 = Mass flow** 2 = Volume flow 3 = Corrected volume flow 4 = Density 5 = Reference density 6 = Oscillation amplitude 1 * 7 = Temperature 8 = Oscillation amplitude 0 * 9 = Signal asymmetry 23 = Carrier pipe temperature * 31 = Oscillation damping fluctuation 1 * 32 = Exciter current 0 33 = Exciter current 1 * 39 = Electronic temperature 45 = Kinematic viscosity * 46 = Dynamic viscosity * 48 = Oscillation frequency 0 50 = Oscillation frequency 1 * 52 = Frequency fluctuation 1 * 63 = Oscillation damping 0 64 = Oscillation damping 1 * 67 = Oscillation damping fluctuation 0 68 = Frequency fluctuation 0 73 = Concentration * 74 = Target mass flow * 75 = Carrier mass flow * 76 = Temp. compensated dynamic viscosity * 77 = Temp. compensated kinematic viscosity * 81 = HBSI *	110
Current span (0353–1 to n)	1: 5923 2: 5924 3: 5925	Integer	Read / Write	0 = 4...20 mA 1 = 4...20 mA US 2 = 4...20 mA NAMUR 3 = 0...20 mA 4 = Fixed current	111
Fixed current (0365–1 to n)	1: 5987 2: 5989 3: 5991	Float	Read / Write	0 to 22.5 mA	112
0/4 mA value (0367–1 to n)	1: 6195 2: 6197 3: 6199	Float	Read / Write	Signed floating-point number	112
20 mA value (0372–1 to n)	1: 5915 2: 5917 3: 5919	Float	Read / Write	Signed floating-point number	114
Measuring mode (0351–1 to n)	1: 5899 2: 5900 3: 5901	Integer	Read / Write	**0 = Forward flow** 2 = Reverse flow compensation 13 = Forward/Reverse flow	115

Navigation: Expert → Output → Current output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🕮
Damping output 1 to n (0363–1 to n)	1: 5903 2: 5905 3: 5907	Float	Read / Write	0.0 to 999.9 s	120
Response time (0378–1 to n)	1: 5867 2: 5869 3: 5871	Float	Read	Positive floating-point number	121
Failure mode (0364–1 to n)	1: 5911 2: 5912 3: 5913	Integer	Read / Write	0 = Min. **1 = Max.** 4 = Actual value 5 = Last valid value 6 = Defined value	122
Failure current (0352–1 to n)	1: 5979 2: 5981 3: 5983	Float	Read / Write	0 to 22.5 mA	124
Output current 1 to n (0361–1 to n)	1: 5931 2: 5933 3: 5935	Float	Read	3.59 to 22.5 mA	124
Measured current 1 to n (0366–1 to n)	1: 5779 2: 5781 3: 5783	Float	Read	0 to 30 mA	124

*   Visibility depends on order options or device settings

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

Navigation: Expert → Output → Pulse/frequency/switch output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🕮
Terminal number (0492–1 to n)	1: 6551 2: 6552 3: 6553	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3) 4 = 20-21 (I/O 4) *	126
Signal mode (0490–1 to n)	1: 6235 2: 6236 3: 6237	Integer	Read / Write	**0 = Passive** 2 = Active	126
Operating mode (0469–1 to n)	1: 4479 2: 4480 3: 9907	Integer	Read / Write	**0 = Pulse** 1 = Switch 12 = Frequency	127
Assign pulse output 1 to n (0460–1 to n)	1: 2461 2: 2462 3: 4685	Integer	Read / Write	**0 = Off** 1 = Mass flow 2 = Volume flow 3 = Corrected volume flow 74 = Target mass flow * 75 = Carrier mass flow *	128
Value per pulse (0455–1 to n)	1: 3034 2: 3036 3: 4714	Float	Read / Write	Signed floating-point number	129
Pulse width (0452–1 to n)	1: 2836 2: 2838 3: 4702	Float	Read / Write	0.05 to 2 000 ms	129
Measuring mode (0457–1 to n)	1: 2394 2: 2395 3: 4683	Integer	Read / Write	**0 = Forward flow** 1 = Reverse flow 2 = Reverse flow compensation 13 = Forward/Reverse flow	130
Failure mode (0480–1 to n)	1: 2948 2: 2949 3: 4708	Integer	Read / Write	0 = Actual value **1 = No pulses**	131

Navigation: Expert → Output → Pulse/frequency/switch output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🕮
Pulse output 1 to n (0456–1 to n)	1: 3082 2: 3084 3: 4718	Float	Read	Positive floating-point number	132
Assign frequency output (0478–1 to n)	1: 2614 2: 2615 3: 9915	Integer	Read / Write	**0 = Off** 1 = Mass flow 2 = Volume flow 3 = Corrected volume flow 4 = Density 5 = Reference density 6 = Oscillation amplitude 1 * 7 = Temperature 8 = Oscillation amplitude 0 * 9 = Signal asymmetry 23 = Carrier pipe temperature * 31 = Oscillation damping fluctuation 1 * 32 = Exciter current 0 33 = Exciter current 1 * 39 = Electronic temperature 45 = Kinematic viscosity * 46 = Dynamic viscosity * 48 = Oscillation frequency 0 50 = Oscillation frequency 1 * 52 = Frequency fluctuation 1 * 63 = Oscillation damping 0 64 = Oscillation damping 1 * 67 = Oscillation damping fluctuation 0 68 = Frequency fluctuation 0 73 = Concentration * 74 = Target mass flow * 75 = Carrier mass flow * 76 = Temp. compensated dynamic viscosity * 77 = Temp. compensated kinematic viscosity *	132
Minimum frequency value (0453–1 to n)	1: 3526 2: 3528 3: 5767	Float	Read / Write	0.0 to 10 000.0 Hz	133
Maximum frequency value (0454–1 to n)	1: 2996 2: 2998 3: 4710	Float	Read / Write	0.0 to 10 000.0 Hz	134
Measuring value at minimum frequency (0476–1 to n)	1: 5887 2: 5889 3: 5891	Float	Read / Write	Signed floating-point number	135
Measuring value at maximum frequency (0475–1 to n)	1: 3514 2: 3516 3: 5759	Float	Read / Write	Signed floating-point number	136
Measuring mode (0479–1 to n)	1: 2922 2: 2923 3: 4706	Integer	Read / Write	**0 = Forward flow** 2 = Reverse flow compensation 13 = Forward/Reverse flow	137
Damping output 1 to n (0477–1 to n)	1: 3522 2: 3524 3: 5763	Float	Read / Write	0 to 999.9 s	138
Response time (0491–1 to n)	1: 5875 2: 5877 3: 5879	Float	Read	Positive floating-point number	139
Failure mode (0451–1 to n)	1: 2367 2: 2368 3: 4681	Integer	Read / Write	0 = Actual value **1 = 0 Hz** 2 = Defined value	140
Failure frequency (0474–1 to n)	1: 3510 2: 3512 3: 9908	Float	Read / Write	0.0 to 12 500.0 Hz	141

Navigation: Expert → Output → Pulse/frequency/switch output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🕮
Output frequency 1 to n (0471–1 to n)	1: 3462 2: 3464 3: 9910	Float	Read	0.0 to 12 500.0 Hz	142
Switch output function (0481–1 to n)	1: 3022 2: 3023 3: 9914	Integer	Read / Write	**0 = Off** 1 = On 2 = Diagnostic behavior 3 = Flow direction check 4 = Limit 5 = Status	142
Assign diagnostic behavior (0482–1 to n)	1: 3096 2: 3097 3: 9913	Integer	Read / Write	**0 = Alarm** 1 = Warning 2 = Alarm or warning	143
Assign limit (0483–1 to n)	1: 3184 2: 3185 3: 4722	Integer	Read / Write	**1 = Mass flow** 2 = Volume flow 3 = Corrected volume flow 4 = Density 5 = Reference density 7 = Temperature 16 = Totalizer 1 17 = Totalizer 2 18 = Totalizer 3 45 = Kinematic viscosity [*] 46 = Dynamic viscosity [*] 73 = Concentration [*] 74 = Target mass flow [*] 75 = Carrier mass flow [*] 76 = Temp. compensated dynamic viscosity [*] 77 = Temp. compensated kinematic viscosity [*] 100 = Oscillation damping	144
Switch-on value (0466–1 to n)	1: 3242 2: 3244 3: 4728	Float	Read / Write	Signed floating-point number	146
Switch-off value (0464–1 to n)	1: 3234 2: 3236 3: 4724	Float	Read / Write	Signed floating-point number	146
Assign flow direction check (0484–1 to n)	1: 3363 2: 3364 3: 4732	Integer	Read / Write	0 = Off **1 = Mass flow** 2 = Volume flow 3 = Corrected volume flow	147
Assign status (0485–1 to n)	1: 3374 2: 3375 3: 4734	Integer	Read / Write	0 = Low flow cut off **1 = Partially filled pipe detection**	147
Switch-on delay (0467–1 to n)	1: 6247 2: 6249 3: 6251	Float	Read / Write	0.0 to 100.0 s	147
Switch-off delay (0465–1 to n)	1: 6239 2: 6241 3: 6243	Float	Read / Write	0.0 to 100.0 s	148
Failure mode (0486–1 to n)	1: 3384 2: 3385 3: 9912	Integer	Read / Write	0 = Actual status **1 = Open** 2 = Closed	148

Navigation: Expert → Output → Pulse/frequency/switch output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Switch status 1 to n (0461–1 to n)	1: 2485 2: 2486 3: 9917	Integer	Read	1 = Open 2 = Closed	148
Invert output signal (0470–1 to n)	1: 2583 2: 2584 3: 9916	Integer	Read / Write	0 = Yes **1 = No**	149

*   Visibility depends on order options or device settings

"Relay output 1 to n" submenu

Navigation: Expert → Output → Relay output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Terminal number (0812–1 to n)	1: 8278 2: 8279 3: 8280	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3) 4 = 20-21 (I/O 4)	150
Relay output function (0804–1 to n)	1: 2488 2: 2489 3: 9876	Integer	Read / Write	1 = Open **2 = Closed** 2 = Diagnostic behavior 3 = Flow direction check 4 = Limit 5 = Digital Output	150
Assign flow direction check (0808–1 to n)	1: 8251 2: 8252 3: 8253	Integer	Read / Write	0 = Off **1 = Mass flow** 2 = Volume flow 3 = Corrected volume flow	151
Assign limit (0807–1 to n)	1: 8248 2: 8249 3: 8250	Integer	Read / Write	**1 = Mass flow** 2 = Volume flow 3 = Corrected volume flow 4 = Density 5 = Reference density 7 = Temperature 16 = Totalizer 1 17 = Totalizer 2 18 = Totalizer 3 45 = Kinematic viscosity [*] 46 = Dynamic viscosity [*] 73 = Concentration [*] 74 = Target mass flow [*] 75 = Carrier mass flow [*] 76 = Temp. compensated dynamic viscosity [*] 77 = Temp. compensated kinematic viscosity [*] 100 = Oscillation damping	151
Assign diagnostic behavior (0806–1 to n)	1: 8245 2: 8246 3: 8247	Integer	Read / Write	**0 = Alarm** 1 = Warning 2 = Alarm or warning	152
Assign status (0805–1 to n)	1: 8272 2: 8273 3: 8274	Integer	Read / Write	0 = Low flow cut off **1 = Partially filled pipe detection**	153
Switch-off value (0809–1 to n)	1: 8260 2: 8262 3: 8264	Float	Read / Write	Signed floating-point number	153
Switch-off delay (0813–1 to n)	1: 8254 2: 8256 3: 8258	Float	Read / Write	0.0 to 100.0 s	153

Navigation: Expert → Output → Relay output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Switch-on value (0810–1 to n)	1: 8233 2: 8235 3: 8237	Float	Read / Write	Signed floating-point number	154
Switch-on delay (0814–1 to n)	1: 8266 2: 8268 3: 8270	Float	Read / Write	0.0 to 100.0 s	154
Failure mode (0811–1 to n)	1: 8242 2: 8243 3: 8244	Integer	Read / Write	0 = Actual status **1 = Open** 2 = Closed	154
Switch status (0801–1 to n)	1: 3518 2: 3519 3: 9875	Integer	Read	1 = Open 2 = Closed	155
Actual relay state (0816–1 to n)	1: 7009 2: 7010 3: 7011	Integer	Read / Write	**1 = Open** 2 = Closed	155

*   Visibility depends on order options or device settings

"Double pulse output" submenu

Navigation: Expert → Output → Double pulse output					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Master terminal number (0981)	5838	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3)	156
Slave terminal number (0990)	5845	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3)	156
Signal mode (0991)	5949	Integer	Read / Write	**0 = Passive** 2 = Active 3 = Passive NAMUR	157
Assign pulse output 1 (0982–1)	5993	Integer	Read / Write	**0 = Off** 1 = Mass flow 2 = Volume flow 3 = Corrected volume flow 74 = Target mass flow * 75 = Carrier mass flow *	157
Value per pulse (0983)	7495	Float	Read / Write	Signed floating-point number	157
Pulse width (0986)	6998	Float	Read / Write	0.5 to 2 000 ms	158
Phase shift (0992)	6089	Integer	Read / Write	**0 = 90°** 1 = 180°	158
Measuring mode (0984)	6001	Integer	Read / Write	**0 = Forward flow** 1 = Reverse flow 2 = Reverse flow compensation 13 = Forward/Reverse flow	158
Failure mode (0985)	6009	Integer	Read / Write	0 = Actual value **1 = No pulses**	159
Pulse output (0987)	7041	Float	Read	Positive floating-point number	160
Invert output signal (0993)	6101	Integer	Read / Write	0 = Yes **1 = No**	160

*   Visibility depends on order options or device settings

6.3.6   "Communication" submenu

"Modbus configuration" submenu

Navigation: Expert → Communication → Modbus configuration					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗎
Bus address (7112)	4910	Integer	Read / Write	1 to 247	161
Baudrate (7111)	4912	Integer	Read / Write	0 = 1200 BAUD 1 = 2400 BAUD 2 = 4800 BAUD 3 = 9600 BAUD **4 = 19200 BAUD** 5 = 38400 BAUD 6 = 57600 BAUD 7 = 115200 BAUD	162
Data transfer mode (7115)	4913	Integer	Read / Write	**0 = RTU** 1 = ASCII	162
Parity (7122)	4914	Integer	Read / Write	**0 = Even** 1 = Odd 2 = None / 2 stop bits 3 = None / 1 stop bit	162
Byte order (7113)	4915	Integer	Read / Write	0 = 0-1-2-3 1 = 3-2-1-0 2 = 2-3-0-1 **3 = 1-0-3-2**	163
Telegram delay (7146)	4916	Float	Read / Write	0 to 100 ms	163
Failure mode (7116)	4920	Integer	Read / Write	1 = Last valid value **255 = NaN value**	163
Bus termination (7155)	5774	Integer	Read	**0 = Off** 1 = On	164
Fieldbus writing access (7156)	6807	Integer	Read / Write	**0 = Read + write** 1 = Read only	164

"Modbus information" submenu

Navigation: Expert → Communication → Modbus information					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗎
Device ID (7153)	2547	Integer	Read	4-digit hexadecimal number	165
Device revision (7154)	4481	Integer	Read	4-digit hexadecimal number	165

"Modbus data map" submenu

Navigation: Expert → Communication → Modbus data map					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📖
Scan list register 0 to 15 (7114)	0: 5001 1: 5002 2: 5003 3: 5004 4: 5005 5: 5006 6: 5007 7: 5008 8: 5009 9: 5010 10: 5011 11: 5012 12: 5013 13: 5014 14: 5015 15: 5016	Integer	Read / Write	1 to 65 535	166

"Web server" submenu

Navigation: Expert → Communication → Web server					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📖
Web server language (7221)	4219	Integer	Read / Write	**0 = English** 1 = Deutsch [*] 2 = Français [*] 3 = Español [*] 4 = Italiano [*] 5 = Nederlands [*] 8 = Svenska [*] 10 = Bahasa Indonesia [*] 11 = 日本語 (Japanese) [*] 12 = Portuguesa [*] 13 = Polski [*] 14 = русский язык (Russian) [*] 15 = čeština (Czech) [*] 16 = 中文 (Chinese) [*] 17 = ภาษาไทย (Thai) [*] 18 = Türkçe [*] 19 = tiếng Việt (Vietnamese) [*] 20 = 한국어 (Korean) [*] 21 = العَرَبِية (Arabic) [*]	167
MAC address (7214)	4210	String	Read	Unique 12-digit character string comprising letters and numbers	167
IP address (7209)	4155	String	Read	4 octet: 0 to 255 (in the particular octet)	168
Subnet mask (7211)	4163	String	Read	4 octet: 0 to 255 (in the particular octet)	168
Default gateway (7210)	4171	String	Read	4 octet: 0 to 255 (in the particular octet)	168
Web server functionality (7222)	4220	Integer	Read / Write	0 = Off **1 = On**	168
Login page (7273)	5802	Integer	Read / Write	0 = Without header **1 = With header**	169

*　　　　Visibility depends on order options or device settings

"WLAN settings" submenu

Navigation: Expert → Communication → WLAN settings					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📖
WLAN (2702)	6178	Integer	Read / Write	0 = Disable **1 = Enable**	170
WLAN IP address (2711)	8643	String	Read / Write	4 octet: 0 to 255 (in the particular octet)	170
WLAN subnet mask (2709)	8651	String	Read / Write	4 octet: 0 to 255 (in the particular octet)	170
WLAN MAC address (2703)	8602	String	Read	Unique 12-digit character string comprising letters and numbers	171
Security type (2705)	6206	Integer	Read / Write	0 = Unsecured **1 = WPA2-PSK**	171
WLAN passphrase (2706)	8611	String	Read / Write	8 to 32-digit character string comprising numbers, letters and special characters	171
Assign SSID name (2708)	6218	Integer	Read / Write	0 = Device tag **1 = User-defined**	172
SSID name (2707)	8627	String	Read / Write	Max. 32-digit character string comprising numbers, letters and special characters	172
Select antenna (2713)	6102	Integer	Read / Write	0 = External antenna **1 = Internal antenna**	172
2.4 GHz WLAN channel (2704)	6182	Integer	Read / Write	1 to 11	173
Apply changes (2712)	6558	Integer	Read / Write	**0 = Cancel** 6 = Ok	173

6.3.7 "Application" submenu

Navigation: Expert → Application					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 📖
Reset all totalizers (2806)	2609	Integer	Read / Write	**0 = Cancel** 1 = Reset + totalize	174

"Totalizer 1 to n" submenu

Navigation: Expert → Application → Totalizer 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Assign process variable (0914–1 to n)	1: 2601 2: 2801 3: 3001	Integer	Read / Write	0 = Off **1 = Mass flow** 2 = Volume flow 3 = Corrected volume flow 74 = Target mass flow * 75 = Carrier mass flow *	175
Unit totalizer 1 to n (0915–1 to n)	1: 4604 2: 4605 3: 4606	Integer	Read / Write	0 = cm³ 1 = dm³ 2 = m³ 3 = ml 4 = l 5 = hl 6 = Ml Mega 8 = af 9 = ft³ 10 = fl oz (us) 11 = gal (us) 12 = Mgal (us) 13 = bbl (us;liq.) 14 = bbl (us;beer) 15 = bbl (us;oil) 16 = bbl (us;tank) 17 = gal (imp) 18 = Mgal (imp) 19 = bbl (imp;beer) 20 = bbl (imp;oil) 21 = User vol. 22 = kgal (us) 50 = g 51 = kg 52 = t 53 = oz 54 = lb 55 = STon 56 = User mass 100 = Nl 101 = Nm³ 102 = Sm³ 103 = Sft³ 104 = Sl 105 = Sgal (us) 106 = Sbbl (us;liq.) 107 = Sgal (imp) 108 = UserCrVol.	175
Totalizer operation mode (0908–1 to n)	1: 2605 2: 2805 3: 3005	Integer	Read / Write	**0 = Net flow total** 1 = Forward flow total 2 = Reverse flow total	176
Control Totalizer 1 to n (0912–1 to n)	1: 2608 2: 2808 3: 3008	Integer	Read / Write	**0 = Totalize** 1 = Reset + totalize 2 = Preset + hold 3 = Reset + hold 4 = Preset + totalize 5 = Hold	177
Preset value 1 to n (0913–1 to n)	1: 2590 2: 2592 3: 2594	Float	Read / Write	Signed floating-point number	178
Failure mode (0901–1 to n)	1: 2606 2: 2806 3: 3006	Integer	Read / Write	**0 = Stop** 1 = Actual value 2 = Last valid value	178

*   Visibility depends on order options or device settings

6.3.8 "Diagnostics" submenu

Navigation: Expert → Diagnostics					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖹
Actual diagnostics (0691)	2732	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	181
Previous diagnostics (0690)	2734	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	182
Operating time from restart (0653)	2624	Integer	Read	Days (d), hours (h), minutes (m) and seconds (s)	182
Operating time (0652)	2631	Integer	Read	Days (d), hours (h), minutes (m) and seconds (s)	183

"Diagnostic list" submenu

Navigation: Expert → Diagnostics → Diagnostic list					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖹
Diagnostics 1 (0692)	2736	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	183
Diagnostics 2 (0693)	2738	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	184
Diagnostics 3 (0694)	2740	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	185
Diagnostics 4 (0695)	2742	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	186
Diagnostics 5 (0696)	2744	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	186

"Event logbook" submenu

Navigation: Expert → Diagnostics → Event logbook					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖹
Filter options (0705)	4596	Integer	Read / Write	0 = Failure (F) 4 = Maintenance required (M) 8 = Function check (C) 12 = Out of specification (S) 16 = Information (I) **255 = All**	187

"Device information" submenu

Navigation: Expert → Diagnostics → Device information					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖹
Device tag (0011)	2026	String	Read	Max. 32 characters, such as letters, numbers or special characters (e.g. @, %, /).	190
Serial number (0009)	7003	String	Read	A maximum of 11-digit character string comprising letters and numbers.	191
Firmware version (0010)	7277	String	Read	Character string in the format xx.yy.zz	191
Device name (0020)	7238	String	Read	Promass300/500	192

Navigation: Expert → Diagnostics → Device information					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Order code (0008)	2058	String	Read	Character string composed of letters, numbers and certain punctuation marks (e.g. /).	192
Extended order code 1 (0023)	2212	String	Read	Character string	192
Extended order code 2 (0021)	2222	String	Read	Character string	193
Extended order code 3 (0022)	2232	String	Read	Character string	193
ENP version (0012)	4003	String	Read	Character string	193

"Mainboard module" submenu

Navigation: Expert → Diagnostics → Mainboard module					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Software revision (0072)	7039	Integer	Read	Positive integer	194

"Sensor electronic module (ISEM)" submenu

Navigation: Expert → Diagnostics → Sensor electronic module (ISEM)					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Software revision (0072)	7039	Integer	Read	Positive integer	194

"I/O module 1" submenu

Navigation: Expert → Diagnostics → I/O module 1					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
I/O module 1 terminal numbers (3902–1)	6541	Integer	Read	0 = Not used 1 = 26-27 (I/O 1) 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3) 4 = 20-21 (I/O 4) [*]	195
Software revision (0072)	7039	Integer	Read	Positive integer	195

*   Visibility depends on order options or device settings

"I/O module 2" submenu

Navigation: Expert → Diagnostics → I/O module 2					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
I/O module 2 terminal numbers (3902–2)	6542	Integer	Read	0 = Not used 1 = 26-27 (I/O 1) 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3) 4 = 20-21 (I/O 4) [*]	195
Software revision (0072)	7039	Integer	Read	Positive integer	195

*   Visibility depends on order options or device settings

"I/O module 3" submenu

Navigation: Expert → Diagnostics → I/O module 3					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗎
I/O module 3 terminal numbers (3902–3)	6543	Integer	Read	0 = Not used 1 = 26-27 (I/O 1) 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3) 4 = 20-21 (I/O 4) *	195
Software revision (0072)	7039	Integer	Read	Positive integer	195

* Visibility depends on order options or device settings

"I/O module 4" submenu

Navigation: Expert → Diagnostics → I/O module 4					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗎
I/O module 4 terminal numbers (3902–4)	6544	Integer	Read	0 = Not used 1 = 26-27 (I/O 1) 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3) 4 = 20-21 (I/O 4) *	195
Software revision (0072)	7039	Integer	Read	Positive integer	195

* Visibility depends on order options or device settings

"Display module" submenu

Navigation: Expert → Diagnostics → Display module					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗎
Software revision (0072)	7039	Integer	Read	Positive integer	198

"Min/max values" submenu

Navigation: Expert → Diagnostics → Min/max values					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗎
Reset min/max values (6151)	2525	Integer	Read / Write	**0 = Cancel** 0 = Torsion oscillation frequency * 6 = Oscillation amplitude 1 * 8 = Oscillation amplitude 10 = Oscillation damping 11 = Torsion oscillation damping * 12 = Oscillation frequency 13 = Signal asymmetry 14 = Torsion signal asymmetry *	207

* Visibility depends on order options or device settings

"Main electronic temperature" submenu

Navigation: Expert → Diagnostics → Min/max values → Main electronic temperature					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗎
Minimum value (0688)	4651	Float	Read	Signed floating-point number	208
Maximum value (0665)	4649	Float	Read	Signed floating-point number	208

"Sensor electronic temperature (ISEM)" submenu

Navigation: Expert → Diagnostics → Min/max values → Sensor electronic temperature (ISEM)					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Minimum value (6052)	2421	Float	Read	Signed floating-point number	209
Maximum value (6051)	2419	Float	Read	Signed floating-point number	209

"Medium temperature" submenu

Navigation: Expert → Diagnostics → Min/max values → Medium temperature					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Minimum value (6109)	7529	Float	Read	Signed floating-point number	210
Maximum value (6108)	7531	Float	Read	Signed floating-point number	210

"Carrier pipe temperature" submenu

Navigation: Expert → Diagnostics → Min/max values → Carrier pipe temperature					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Minimum value (6030)	7533	Float	Read	Signed floating-point number	211
Maximum value (6029)	7535	Float	Read	Signed floating-point number	211

"Oscillation frequency" submenu

Navigation: Expert → Diagnostics → Min/max values → Oscillation frequency					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Minimum value (6071)	2459	Float	Read	Signed floating-point number	212
Maximum value (6070)	2468	Float	Read	Signed floating-point number	212

"Torsion oscillation frequency" submenu

Navigation: Expert → Diagnostics → Min/max values → Torsion oscillation frequency					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Minimum value (6069)	2519	Float	Read	Signed floating-point number	213
Maximum value (6068)	2517	Float	Read	Signed floating-point number	213

"Oscillation amplitude" submenu

Navigation: Expert → Diagnostics → Min/max values → Oscillation amplitude					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖺
Minimum value (6010)	2472	Float	Read	Signed floating-point number	213
Maximum value (6009)	2470	Float	Read	Signed floating-point number	214

"Torsion oscillation amplitude" submenu

Navigation: Expert → Diagnostics → Min/max values → Torsion oscillation amplitude					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖹
Minimum value (6008)	2515	Float	Read	Signed floating-point number	214
Maximum value (6007)	2480	Float	Read	Signed floating-point number	214

"Oscillation damping" submenu

Navigation: Expert → Diagnostics → Min/max values → Oscillation damping					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖹
Minimum value (6122)	2478	Float	Read	Signed floating-point number	215
Maximum value (6121)	2423	Float	Read	Signed floating-point number	215

"Torsion oscillation damping" submenu

Navigation: Expert → Diagnostics → Min/max values → Torsion oscillation damping					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖹
Minimum value (6120)	2523	Float	Read	Signed floating-point number	216
Maximum value (6119)	2521	Float	Read	Signed floating-point number	216

"Signal asymmetry" submenu

Navigation: Expert → Diagnostics → Min/max values → Signal asymmetry					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖹
Minimum value (6015)	2474	Float	Read	Signed floating-point number	216
Maximum value (6014)	2476	Float	Read	Signed floating-point number	217

"Torsion signal asymmetry" submenu

Navigation: Expert → Diagnostics → Min/max values → Torsion signal asymmetry					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🖹
Minimum value (6284)	7000	Float	Read	Signed floating-point number	217
Maximum value (6283)	6924	Float	Read	Signed floating-point number	217

"Data logging" submenu

Navigation: Expert → Diagnostics → Data logging					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗎
Assign channel 1 (0851)	2445	Integer	Read / Write	**0 = Off** 1 = Mass flow 2 = Volume flow 3 = Corrected volume flow 4 = Density 5 = Reference density 6 = Oscillation amplitude 1 * 7 = Temperature 8 = Oscillation amplitude * 9 = Signal asymmetry 23 = Carrier pipe temperature * 31 = Oscillation damping fluctuation 1 * 32 = Exciter current 0 33 = Exciter current 1 * 39 = Electronic temperature 45 = Kinematic viscosity * 46 = Dynamic viscosity * 48 = Oscillation frequency 0 50 = Oscillation frequency 1 * 52 = Frequency fluctuation 1 * 63 = Oscillation damping 0 64 = Oscillation damping 1 * 67 = Oscillation damping fluctuation 0 68 = Frequency fluctuation 0 73 = Concentration * 74 = Target mass flow * 75 = Carrier mass flow * 76 = Temp. compensated dynamic viscosity * 77 = Temp. compensated kinematic viscosity * 121 = Current output 1 122 = Current output 2 * 123 = Current output 3 *	199
Assign channel 2 (0852)	2446	Integer	Read / Write	Picklist, see **Assign channel 1** parameter (→ 🗎 199)	200
Assign channel 3 (0853)	2548	Integer	Read / Write	Picklist, see **Assign channel 1** parameter (→ 🗎 199)	200
Assign channel 4 (0854)	4286	Integer	Read / Write	Picklist, see **Assign channel 1** parameter (→ 🗎 199)	200
Logging interval (0856)	4288	Float	Read / Write	0.1 to 999.0 s	201
Clear logging data (0855)	4287	Integer	Read / Write	**0 = Cancel** 1 = Clear data	201
Data logging (0860)	5950	Integer	Read / Write	**0 = Overwriting** 1 = Not overwriting	202
Logging delay (0859)	5938	Integer	Read / Write	0 to 999 h	202
Data logging control (0857)	5930	Integer	Read / Write	**0 = None** 1 = Stop 2 = Delete + start	203
Data logging status (0858)	5937	Integer	Read	**0 = Done** 1 = Stopped 2 = Active 3 = Delay active	203
Entire logging duration (0861)	2827	Float	Read	Positive floating-point number	204

*   Visibility depends on order options or device settings

"Simulation" submenu

Navigation: Expert → Diagnostics → Simulation					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 🗎
Assign simulation process variable (1810)	6813	Integer	Read / Write	**0 = Off** 1 = Mass flow 2 = Volume flow 3 = Corrected volume flow 4 = Density 5 = Reference density 7 = Temperature 45 = Kinematic viscosity [*] 46 = Dynamic viscosity [*] 73 = Concentration [*] 74 = Target mass flow [*] 75 = Carrier mass flow [*] 76 = Temp. compensated dynamic viscosity [*] 77 = Temp. compensated kinematic viscosity [*]	219
Process variable value (1811)	6814	Float	Read / Write	Depends on the process variable selected	220
Status input simulation (1355)	2620	Integer	Read / Write	**0 = Off** 1 = On	220
Input signal level (1356)	2638	Integer	Read / Write	0 = Low 1 = High	221
Current input 1 to n simulation (1608–1 to n)	1: 6127 2: 6128 3: 6129	Integer	Read / Write	**0 = Off** 1 = On	221
Value current input 1 to n (1609–1 to n)	1: 6139 2: 6141 3: 6143	Float	Read / Write	0 to 22.5 mA	222
Current output 1 to n simulation (0354–1 to n)	1: 5939 2: 5940 3: 5941	Integer	Read / Write	**0 = Off** 1 = On	222
Value current output 1 to n (0355–1 to n)	1: 5995 2: 5997 3: 5999	Float	Read / Write	3.59 to 22.5 mA	222
Frequency output simulation 1 to n (0472–1 to n)	1: 6203 2: 6204 3: 6205	Integer	Read / Write	**0 = Off** 1 = On	223
Frequency value 1 to n (0473–1 to n)	1: 6207 2: 6209 3: 6211	Float	Read / Write	0.0 to 12 500.0 Hz	223
Pulse output simulation 1 to n (0458–1 to n)	1: 6215 2: 6216 3: 6217	Integer	Read / Write	**0 = Off** 1 = Down-counting value 2 = Fixed value	224
Pulse value 1 to n (0459–1 to n)	1: 6219 2: 6220 3: 6221	Integer	Read / Write	0 to 65 535	224
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