

Description of Device Parameters

Proline Prosonic Flow 300

Modbus RS485

Ultrasonic time-of-flight flowmeter

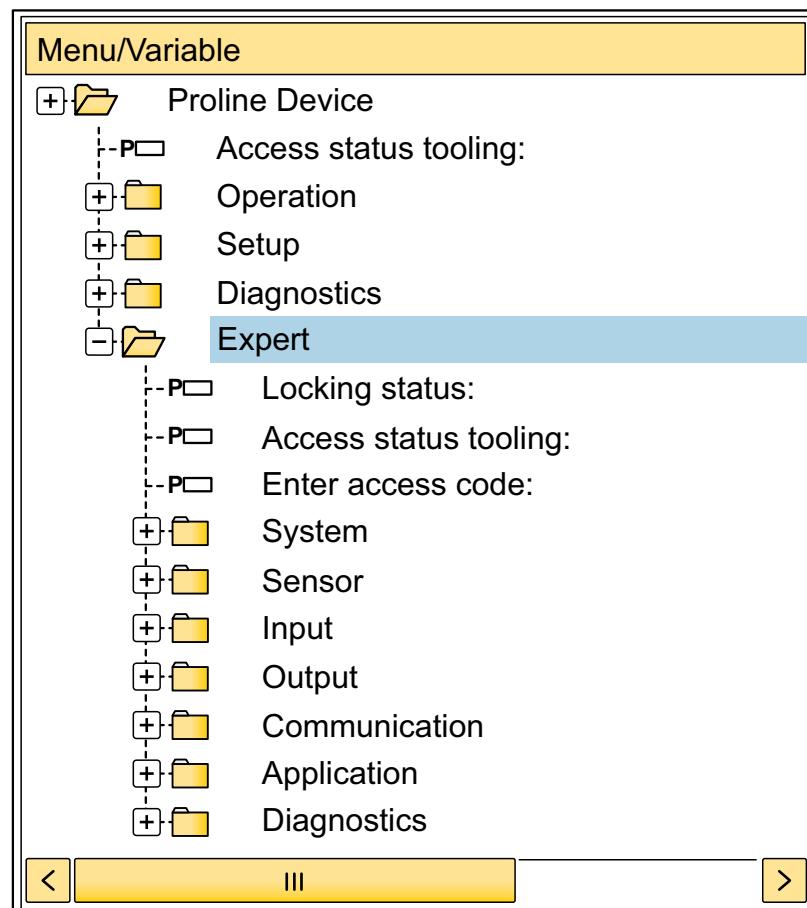


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1 About this document

1.1 Document function

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

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

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

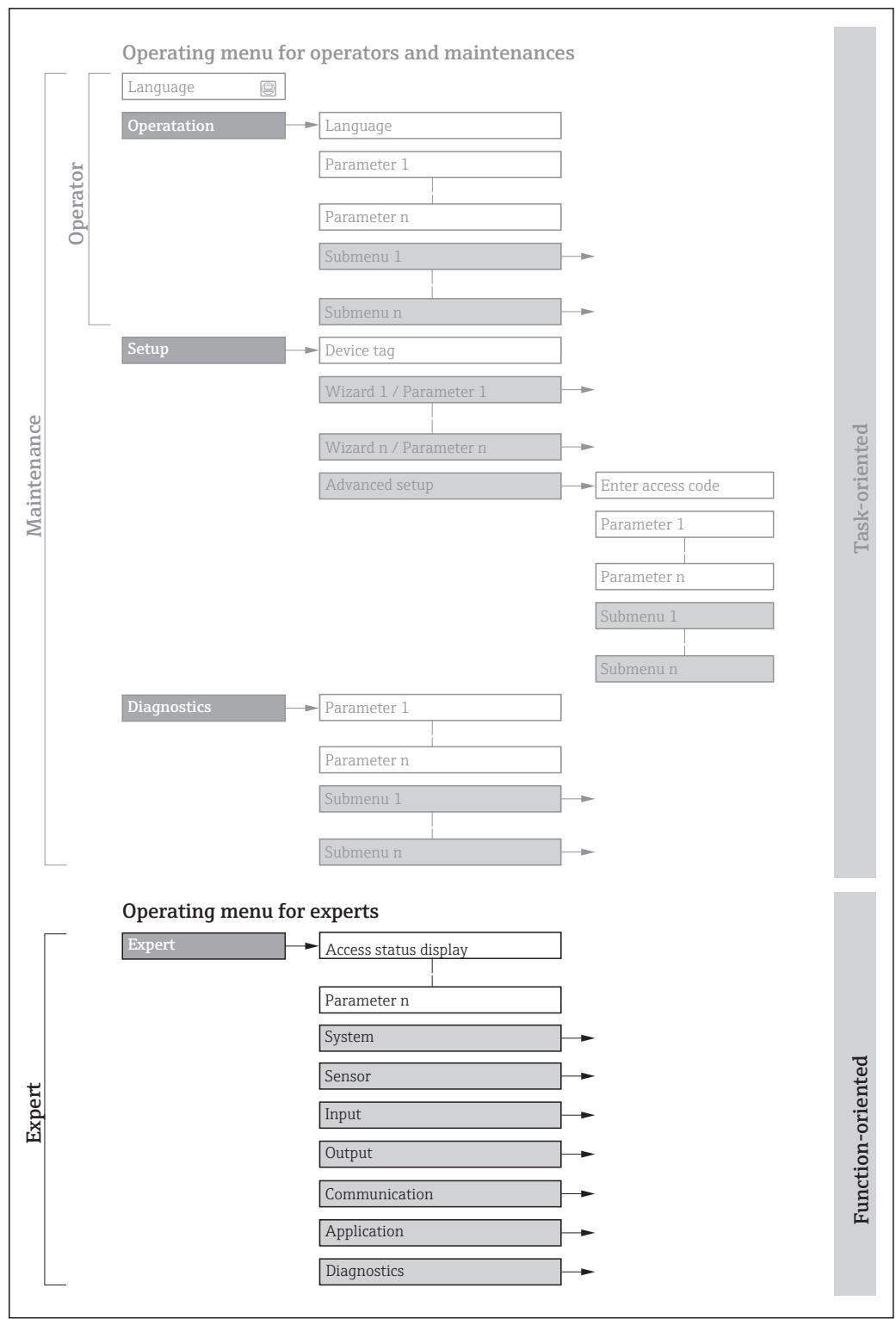
1.2 Target group

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

1.3 Using this document

1.3.1 Information on the document structure

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



1 Sample graphic for the schematic layout of the operating menu



Additional information regarding:

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

1.3.2 Structure of a parameter description

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

Complete parameter name

Write-protected parameter = 

Navigation



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

Prerequisite

The parameter is only available under these specific conditions

Description

Description of the parameter function

Selection

List of the individual options for the parameter

- Option 1
- Option 2

User entry

Input range for the parameter

User interface

Display value/data for the parameter

Factory setting

Default setting ex works

Additional information

Additional explanations (e.g. in examples):

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

1.4 Symbols used

1.4.1 Symbols for certain types of information

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

1.4.2 Symbols in graphics

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

1.5 Documentation

1.5.1 Standard documentation

Operating Instructions

Measuring device	Documentation code
Prosonic Flow G 300	BA01835D

1.5.2 Supplementary device-dependent documentation

Special documentation

Content	Documentation code
Information on the Pressure Equipment Directive	SD01614D
Remote display and operating module DKX001	SD01763D
Radio approvals for WLAN interface for A309/A310 display module	SD01793D
Advanced gas analysis	SD02350D
Heartbeat Technology	SD02303D
Web server	SD02310D

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	→ 11
Locking status	→ 12
Access status	→ 13
Ent. access code	→ 13
▶ System	→ 13
▶ Display	→ 14
▶ Config. backup	→ 27
▶ Diagn. handling	→ 30
▶ Administration	→ 41
▶ Sensor	→ 46
▶ Measured val.	→ 46
▶ System units	→ 62
▶ Process param.	→ 74
▶ Measurement mode	→ 78
▶ External comp.	→ 85
▶ Sensor adjustm.	→ 85
▶ Calibration	→ 96
▶ I/O config.	→ 97
I/O 1 to n terminals	→ 97
I/O 1 to n info	→ 97
I/O 1 to n type	→ 98

Apply I/O config	→ 98
Alteration code	→ 99
▶ Input	→ 99
▶ Current input 1 to n	→ 99
▶ Status input 1 to n	→ 102
▶ Output	→ 104
▶ Curr.output 1 to n	→ 104
▶ PFS output 1 to n	→ 117
▶ Relay output 1 to n	→ 136
▶ Double pulse out	→ 143
▶ Communication	→ 147
▶ Modbus config.	→ 148
▶ Modbus info	→ 153
▶ Modbus data map	→ 154
▶ Web server	→ 154
▶ WLAN settings	→ 157
▶ Application	→ 164
Reset all tot.	→ 164
▶ Totalizer 1 to n	→ 165
▶ Diagnostics	→ 170
Actual diagnos.	→ 171
Prev.diagnostics	→ 172
Time fr. restart	→ 173
Operating time	→ 173
▶ Diagnostic list	→ 173

▶ Event logbook	→ 178
▶ Device info	→ 180
▶ Main elec.+I/O1	→ 183
▶ Sens. electronic	→ 184
▶ I/O module 2	→ 187
▶ I/O module 3	→ 188
▶ Display module	→ 189
▶ Data logging	→ 190
▶ Heartbeat	→ 198
▶ Simulation	→ 198

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	→ 11
Locking status	→ 12
Access status	→ 13
Ent. access code	→ 13
▶ System	→ 13
▶ Sensor	→ 46
▶ I/O config.	→ 97
▶ Input	→ 99
▶ Output	→ 104
▶ Communication	→ 147
▶ Application	→ 164
▶ Diagnostics	→ 170

Direct access



Navigation

Expert → Direct access (0106)

Description

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

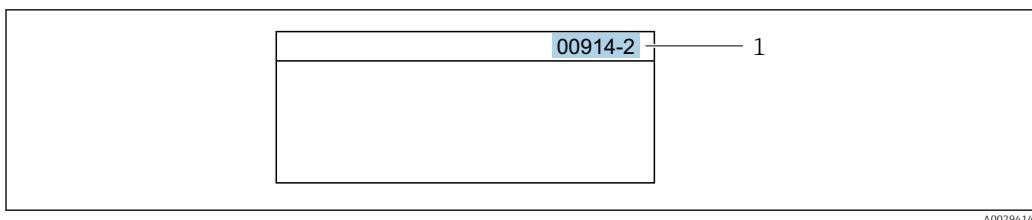
User entry

0 to 65 535

Additional information

User entry

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



1 Direct access code

A0029414

Note the following when entering the direct access code:

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

Locking status

Navigation

Expert → Locking status (0004)

Description

Displays the active write protection.

User interface

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

Additional information

Display

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

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

Selection

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

Access status

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

Ent. access code

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

3.1 "System" submenu

<i>Navigation</i>	  Expert → System										
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;"> System</td> <td style="width: 10%;"></td> </tr> <tr> <td style="padding: 5px;"> Display</td> <td style="text-align: right; width: 10%;">→  14</td> </tr> <tr> <td style="padding: 5px;"> Config. backup</td> <td style="text-align: right; width: 10%;">→  27</td> </tr> <tr> <td style="padding: 5px;"> Diagn. handling</td> <td style="text-align: right; width: 10%;">→  30</td> </tr> <tr> <td style="padding: 5px;"> Administration</td> <td style="text-align: right; width: 10%;">→  41</td> </tr> </table>		 System		 Display	→  14	 Config. backup	→  27	 Diagn. handling	→  30	 Administration	→  41
 System											
 Display	→  14										
 Config. backup	→  27										
 Diagn. handling	→  30										
 Administration	→  41										

3.1.1 "Display" submenu

Navigation

Expert → System → Display

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

Display language

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

Prerequisite A local display is provided.

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

Selection

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

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

Format display

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

Prerequisite A local display is provided.

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

Selection

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

Factory setting 1 value, max.

Additional information*Description*

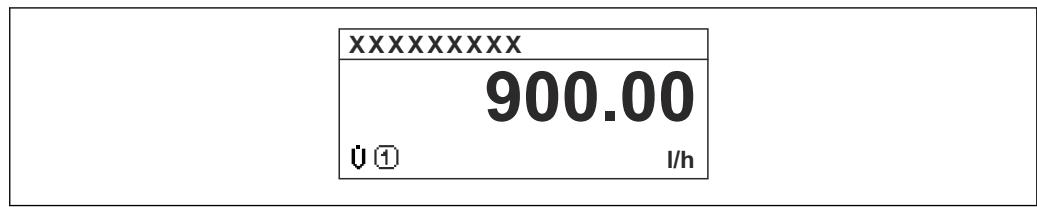
The display format (size, bar graph etc.) and number of measured values displayed simultaneously (1 to 4) can be configured. This setting only applies to normal operation.



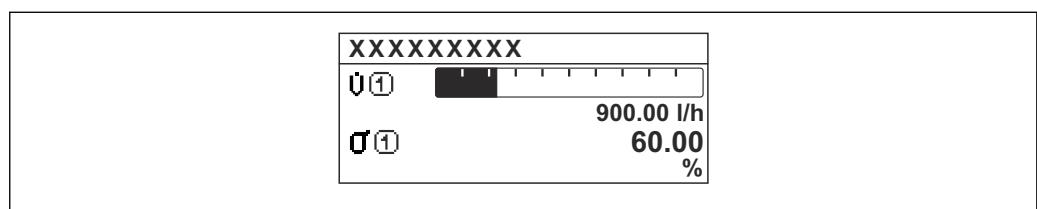
- The **Value 1 display** parameter (→ 18) to **Value 4 display** parameter (→ 23) are used to specify which measured values are shown on the local display and in what order.
- If more measured values are specified than the display mode selected permits, then the values alternate on the device display.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

Possible measured values shown on the local display:

"1 value, max." option



"Bagr. + 1 value" option



"2 values" option

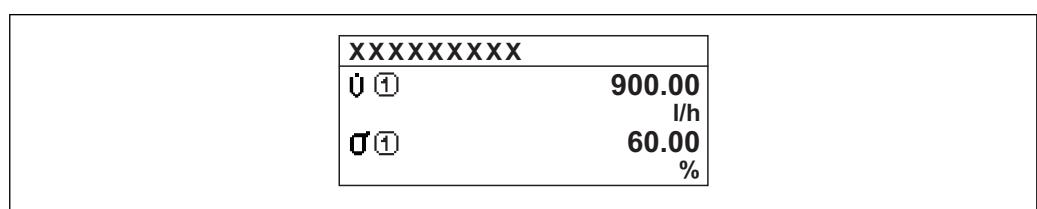
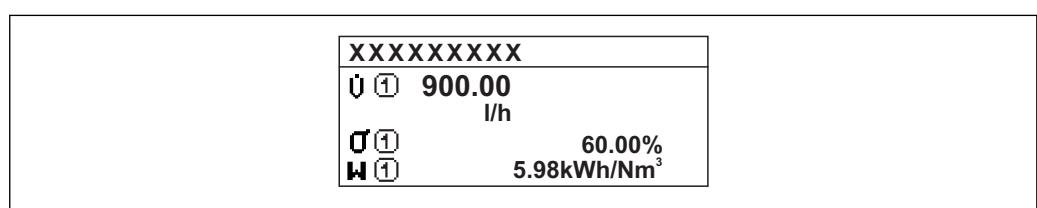
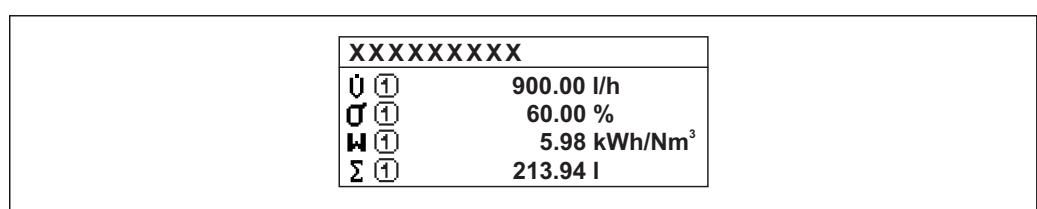


Fig. 2

"Val. large+2val." option



"4 values" option



Value 1 display**Navigation**

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

Prerequisite

A local display is provided.

Description

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

Selection

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

Factory setting

Volume flow

Additional information*Description*

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

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

Dependency

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

* Visibility depends on order options or device settings

0% bargraph 1

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-dependent
Additional information	<i>Description</i> The Format display parameter (→ 15) is used to specify that the measured value is to be displayed as a bar graph. <i>User entry</i> The unit of the displayed measured value is taken from the System units submenu (→ 62).

100% bargraph 1

Navigation	Expert → System → Display → 100% bargraph 1 (0125)
Prerequisite	A local display is provided.
Description	Use this function to enter the 100% bar graph value to be shown on the display for the measured value 1.
User entry	Signed floating-point number
Factory setting	Depends on country and nominal diameter → 209
Additional information	<i>Description</i> The Format display parameter (→ 15) is used to specify that the measured value is to be displayed as a bar graph. <i>User entry</i> The unit of the displayed measured value is taken from the System units submenu (→ 62).

Decimal places 1

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

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

Selection

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

Factory setting X.XX

Additional information *Description*

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

Value 2 display



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

Prerequisite A local display is provided.

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

Selection

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

* Visibility depends on order options or device settings

Factory setting None

Additional information *Description*

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

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

Dependency

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

Decimal places 2



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

Prerequisite A measured value is specified in the **Value 2 display** parameter (→ 20).

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

Selection

- 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 shown on the local display.

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

Factory setting None

Additional information*Description*

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

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

Selection

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

0% bargraph 3**Navigation**

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

Prerequisite

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

Description

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

User entry

Signed floating-point number

Factory setting

Country-dependent

Additional information*Description*

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

User entry

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

100% bargraph 3**Navigation**

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

Prerequisite

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

Description

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

User entry

Signed floating-point number

Factory setting

0

Additional information*Description*

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

User entry

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

Decimal places 3**Navigation**

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

Prerequisite

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

Description

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

Selection

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

Factory setting

X.XX

Additional information*Description*

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

Value 4 display**Navigation**

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

Prerequisite

A local display is provided.

Description

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

Selection

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

Factory setting

None

Additional information*Description*

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

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

Selection

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

Decimal places 4**Navigation**

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

Prerequisite

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

Description

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

Selection

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

Factory setting

X.XX

Additional information*Description*

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

Display interval**Navigation**

 Expert → System → Display → Display interval (0096)

Prerequisite

A local display is provided.

Description

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

User entry

1 to 10 s

Factory setting

5 s

Additional information*Description*

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



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

Display damping**Navigation**

Expert → System → Display → Display damping (0094)

Prerequisite

A local display is provided.

Description

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

User entry

0.0 to 999.9 s

Factory setting

0.0 s

Additional information*User entry*

Use this function to enter a time constant (PT1 element¹⁾) for display damping:

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



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

Header**Navigation**

Expert → System → Display → Header (0097)

Prerequisite

A local display is provided.

Description

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

Selection

- Device tag
- Free text

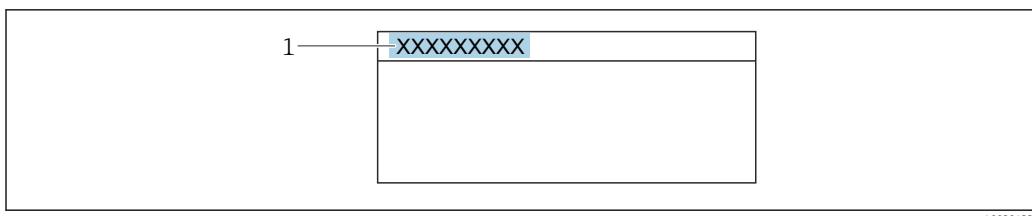
Factory setting

Device tag

Additional information*Description*

The header text only appears during normal operation.

1) proportional transmission behavior with first order delay



A0029422

1 Position of the header text on the display

Selection

- Device tag
Is defined in the **Device tag** parameter (→ 180).
- Free text
Is defined in the **Header text** parameter (→ 26).

Header text



Navigation

Expert → System → Display → Header text (0112)

Prerequisite

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

Description

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

User entry

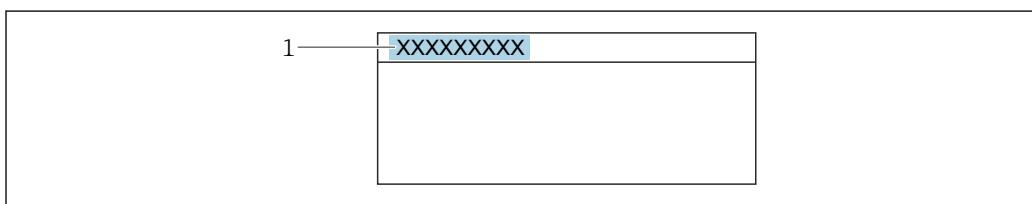
Max. 12 characters such as letters, numbers or special characters (e.g. @, %, /)

Factory setting

Additional information

Description

The header text only appears during normal operation.



A0029422

1 Position of the header text on the display

User entry

The number of characters displayed depends on the characters used.

Separator



Navigation

Expert → System → Display → Separator (0101)

Prerequisite

A local display is provided.

Description Use this function to select the decimal separator.

Selection

- . (point)
- , (comma)

Factory setting . (point)

Contrast display

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

Prerequisite A local display is provided.

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

User entry 20 to 80 %

Factory setting Depends on the display

Backlight

Navigation  Expert → System → Display → Backlight (0111)

Prerequisite One of the following conditions is met:

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

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

Selection

- Disable
- Enable

Factory setting Enable

3.1.2 "Configuration backup" submenu

Navigation  Expert → System → Config. backup

► Config. backup

Operating time (0652)

→  28

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

Operating time

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

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

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

Additional information *User interface*

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

Last backup

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

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

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

Config. managem.



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

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

Selection

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

Factory setting Cancel

* Visibility depends on order options or device settings

Additional information*Selection*

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

HistoROM

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

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

Displays the status of the data backup process.

User interface

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

Factory setting

None

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

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

User interface

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

- Backup corrupt
- Check not done
- Dataset incomp.

Factory setting Check not done

Additional information *Description*

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

Selection

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

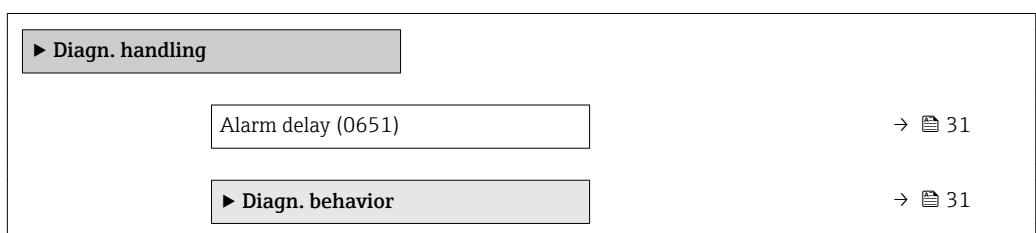
HistoROM

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

3.1.3 "Diagn. handling" submenu

Navigation

Expert → System → Diagn. handling



Alarm delay**Navigation**

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

Description

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



The diagnostic message is reset without a time delay.

User entry

0 to 60 s

Factory setting

0 s

Additional information*Result*

This setting affects the following diagnostic messages:

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

"Diagn. behavior" submenu

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

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

Options	Description
Alarm	The device stops measurement. The 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 only	The device continues to measure. The diagnostic message is displayed only in the Event logbook submenu (→ 178) (Event list submenu (→ 179)) and is not displayed in alternation with the operational display.
Off	The diagnostic event is ignored, and no diagnostic message is generated or entered.



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

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

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

Diagnostic no. 124 (Rel.sig.strength)



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

Diagnostic no. 125 (Rel. sound vel.)



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

Diagnostic no. 160 (Signal path off)



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

Diagnostic no. 302 (Verific. active)

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

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

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

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

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

Additional information

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

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

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

Prerequisite

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

Description

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

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

Additional information

Selection



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

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

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

Prerequisite

The device has one current input.

Description

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

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

Additional information

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

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

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

Description

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

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

Diagnostic no. 543 (Double pulse out)



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

Diagnostic no. 832 (Electronic temp.)



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

Diagnostic no. 833 (Electronic temp.)

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

Diagnostic no. 834 (Process temp.)

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

Diagnostic no. 835 (Process temp.)

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

Additional information*Selection*

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

Diagnostic no. 837 (Process pressure)

**Navigation**

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

Description

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

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

Additional information

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

Diagnostic no. 841 (Sensor range)

**Navigation**

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

Description

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

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

Additional information

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

Diagnostic no. 842 (Process limit)

**Navigation**

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

Description

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

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

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

Additional information	 Detailed description of the options available for selection: → 31
-------------------------------	---

Diagnostic no. 870 (Meas. inaccuracy)



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

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



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

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

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

Description

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

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Alarm

Additional information

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

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

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

Description

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

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Alarm

Additional information

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

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

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

Description

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

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting

Warning

Additional information

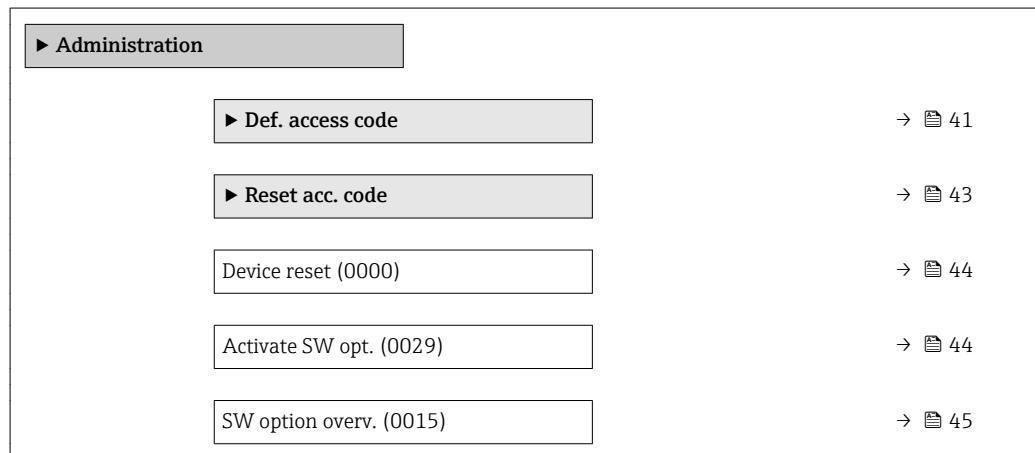
Detailed description of the options available for selection: → [31](#)

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

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

3.1.4 "Administration" submenu*Navigation*

Expert → System → Administration

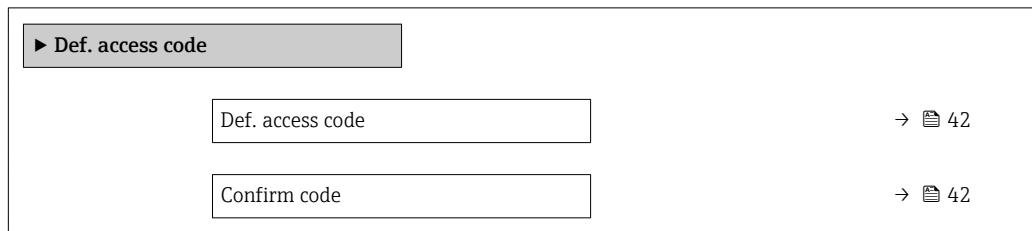
**"Def. access code" wizard**

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

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

Navigation

Expert → System → Administration → Def. access code

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

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

Description

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

User entry

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

Additional information**Description**

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

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

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

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

User entry

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

Factory setting

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

Confirm code**Navigation**

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

Description

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

User entry

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

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

Operating time (0652)

→  43

Reset acc. code (0024)

→  43

Operating time

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

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

User interface

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

Additional information*User interface*

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

Reset acc. code

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

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

User entry

Character string comprising numbers, letters and special characters

Factory setting

0x00

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

The reset code can only be entered via:

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

Additional parameters in the "Administration" submenu

Device reset



Navigation

Expert → System → Administration → Device reset (0000)

Description

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

Selection

- Cancel
- To delivery set.
- Restart device

Factory setting

Cancel

Additional information

Selection

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

Activate SW opt.



Navigation

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

Description

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

User entry

Max. 10-digit string consisting of numbers.

Factory setting

Depends on the software option ordered

Additional information

Description

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

User entry

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

NOTE!

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

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

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

Example for a software option

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

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

Web browser

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

SW option overv.

Navigation

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

Description

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

User interface

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

Additional information

Description

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

"Extend. HistoROM" option

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

"HBT Verification" option and "HBT Monitoring" option

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

"Ad. gas analysis" option

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

3.2 "Sensor" submenu

Navigation

Expert → Sensor

► Sensor	
► Measured val.	→ 46
► System units	→ 62
► Process param.	→ 74
► Measurement mode	→ 78
► External comp.	→ 85
► Sensor adjustm.	→ 85
► Calibration	→ 96

3.2.1 "Measured val." submenu

Navigation

Expert → Sensor → Measured val.

► Measured val.	
► Process variab.	→ 46
► System values	→ 52
► Totalizer	→ 54
► Input values	→ 56
► Output values	→ 57

"Process variables" submenu

Navigation

Expert → Sensor → Measured val. → Process variab.

► Process variab.	
Volume flow (1838)	→ 47
Correct.vol.flow (1857)	→ 50
Mass flow (1847)	→ 47

Flow velocity (1852)	→ 49
Sound velocity (1850)	→ 48
Temperature (1853)	→ 49
Pressure (1872)	→ 48
Dry CH ₄ in % (1863)	→ 50
Molar mass (1864)	→ 50
Density (1865)	→ 51
Dynam. viscosity (1887)	→ 51
Calorific value (1893)	→ 52
Wobbe index (1854)	→ 49
Energy flow (1851)	→ 48

Volume flow

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

Description Displays the volume flow that is currently measured.

User interface Signed floating-point number

Additional information *Dependency*

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

Mass flow

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

Description Displays the mass flow currently calculated.

User interface Signed floating-point number

Additional information *Dependency*

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

Sound velocity

Navigation	  Expert → Sensor → Measured val. → Process variab. → Sound velocity (1850)
Description	Displays the sound velocity that is currently measured.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Velocity unit parameter (→  68)

Pressure

Navigation	  Expert → Sensor → Measured val. → Process variab. → Pressure (1872)
Prerequisite	For the following order code: "Measuring tube; Transducer; Sensor version", option AC "316L; Titanium Gr. 2; pressure + temperature measurement integrated"
	 The software options currently enabled are displayed in the SW option overv. parameter (→  45).
Description	Displays the pressure that is currently measured.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Pressure unit parameter (→  69)

Energy flow

Navigation	  Expert → Sensor → Measured val. → Process variab. → Energy flow (1851)
Description	Displays the energy flow that is currently calculated.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Energy flow unit parameter (→  72)

Flow velocity

Navigation	  Expert → Sensor → Measured val. → Process variab. → Flow velocity (1852)
Description	Displays the flow velocity that is currently measured.
User interface	Signed floating-point number

Temperature

Navigation	  Expert → Sensor → Measured val. → Process variab. → Temperature (1853)
Prerequisite	For the following order codes: <ul style="list-style-type: none">■ "Measuring tube; Transducer; Sensor version", option AB "316L; Titanium Gr. 2; temperature measurement integrated"■ "Measuring tube; Transducer; Sensor version", option AC "316L; Titanium Gr. 2; pressure + temperature measurement integrated"
	 The software options currently enabled are displayed in the SW option overv. parameter (→  45).
Description	Displays the medium temperature that is currently measured.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Temperature unit parameter (→  69)

Wobbe index

Navigation	  Expert → Sensor → Measured val. → Process variab. → Wobbe index (1854)
Prerequisite	For the following order code: "Application package", option EF "Advanced gas analysis"
	 The software options currently enabled are displayed in the SW option overv. parameter (→  45).
Description	Displays the Wobbe index that is currently calculated.
User interface	Signed floating-point number
Additional information	<i>Description</i> The Wobbe index compares the combustion energy output of different composition fuel gases in an appliance. If two fuels have identical Wobbe indices then for given pressure and valve settings the energy output will also be identical. The Wobbe index is the ratio of the calorific value (heating value) and the square root of the gases' relative density (often called specific gravity). The relative density is the ratio of

the density of the gas and the density of dry air under the same pressure and temperature conditions. This index refers to the gross calorific value (sometimes called gross energy or upper heating value or higher calorific value) or net calorific value (sometimes called net energy or lower heating value or lower calorific value).

Dependency

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

Correct.vol.flow

Navigation	  Expert → Sensor → Measured val. → Process variab. → Correct.vol.flow (1857)
Description	Displays the corrected volume flow that is currently measured.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Cor.volflow unit parameter (→ 66)

Dry CH₄ in %

Navigation	  Expert → Sensor → Measured val. → Process variab. → Dry CH ₄ in % (1863)
Prerequisite	For the following order code: "Application package", option EF "Advanced gas analysis"
	 The software options currently enabled are displayed in the SW option overv. parameter (→ 45).
Description	Displays the methane content in Mol% that is currently calculated.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Velocity unit parameter (→ 68)

Molar mass

Navigation	  Expert → Sensor → Measured val. → Process variab. → Molar mass (1864)
Prerequisite	For the following order code: "Application package", option EF "Advanced gas analysis"

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

User interface Signed floating-point number

Density

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

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

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

Description Displays the density that is currently calculated.

Dependency

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

User interface Signed floating-point number

Additional information *Dependency*

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

Dynam. viscosity

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

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

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

Description Displays the dynamic viscosity that is currently calculated.

User interface Signed floating-point number

Additional information *Dependency*

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

Calorific value

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

Prerequisite For the following order code:
"Application package", option EF "Advanced gas analysis"
 The software options currently enabled are displayed in the **SW option overv.** parameter (→ [45](#)).

Description Displays the calorific value that is currently calculated.

User interface Signed floating-point number

Additional information *Dependency*

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

"System values" submenu

Navigation  Expert → Sensor → Measured val. → System values

 System values	
Signal strength (2914)	→ 52
SNR (2917)	→ 53
Turbulence (2907)	→ 53
Flow asymmetry (2913)	→ 53

Signal strength

Navigation  Expert → Sensor → Measured val. → System values → Signal strength (2914)

Description Displays the current signal strength.

User interface Signed floating-point number

Additional information *Description*

A drop in the signal strength over time can be an indicator of deposit buildup on the converter or high ultrasonic damping in the gas.

SNR

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

Acceptance rate

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

Turbulence

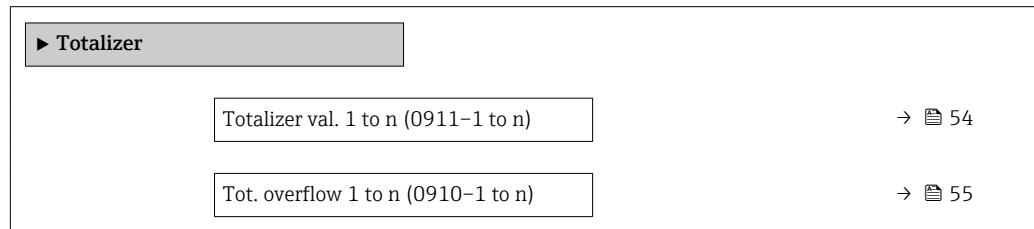
Navigation	 Expert → Sensor → Measured val. → System values → Turbulence (2907)
Description	Displays the current turbulence.
User interface	Signed floating-point number
Additional information	<i>Description</i> A high turbulence value indicates a disturbance in the flow profile.

Flow asymmetry

Navigation	 Expert → Sensor → Measured val. → System values → Flow asymmetry (2913)
Prerequisite	 Only available from nominal diameter DN 50 (2").
Description	Displays the asymmetry of the flow velocity between signal path 1 and signal path 2.
User interface	Signed floating-point number

Additional information*Limit values*

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

"Totalizer" submenu**Navigation** Expert → Sensor → Measured val. → Totalizer**Totalizer val. 1 to n****Navigation** Expert → Sensor → Measured val. → Totalizer → Totalizer val. 1 to n (0911-1 to n)**Prerequisite**

One of the following options is selected in the **Assign variable** parameter (→ 165) of the **Totalizer 1 to n** submenu:

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

Description

Displays the current totalizer reading.

User interface

Signed floating-point number

Additional information*Description*

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



In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→ 169).

User interface

The value of the process variable totalized since measuring began can be positive or negative. This depends on the settings in the **Operation mode** parameter (→ 167).



The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 166).

Example

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

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

Tot. overflow 1 to n**Navigation**

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

Prerequisite

One of the following options is selected in the **Assign variable** parameter (→ 165) of the **Totalizer 1 to n** submenu:

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

Description

Displays the current totalizer overflow.

User interface

Integer with sign

Additional information*Description*

If the current totalizer reading exceeds 7 digits, which is the maximum value range that can be displayed by the operating tool, the value above this range is output as an overflow.

The current totalizer value is therefore the sum of the overflow value and the totalizer value from the **Totalizer val. 1 to n** parameter.

User interface

i The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ [56](#) 166).

Example

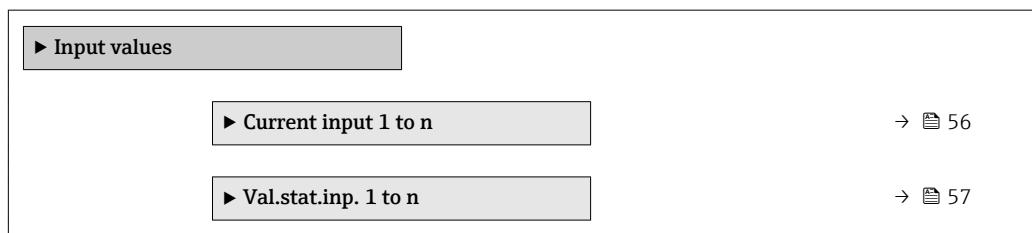
Calculation of the current totalizer reading when the value exceeds the 7-digit display range of the operating tool:

- Value in the **Totalizer val. 1** parameter: 1968457 m³
- Value in the **Tot. overflow 1** parameter: $2 \cdot 10^7$ (2 overflows) = 20 000 000 [m³]
- Current totalizer reading: 21 968 457 m³

"Input values" submenu

Navigation

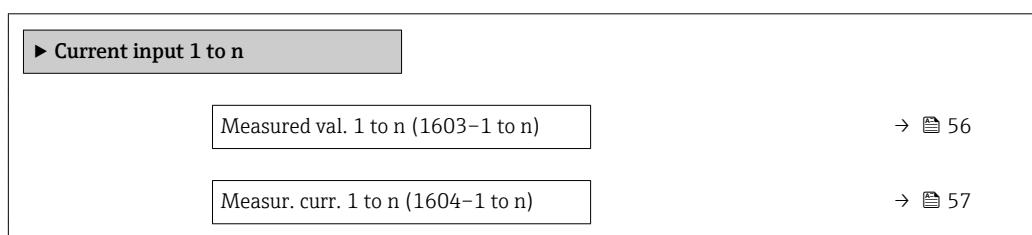
Expert → Sensor → Measured val. → Input values



"Current input 1 to n" submenu

Navigation

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



Measured val. 1 to n

Navigation

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

Description

Displays the current input value.

User interface

Signed floating-point number

Additional information*Dependency*

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

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

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

Description

Displays the current value of the current input.

User interface

0 to 22.5 mA

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

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

► Val.stat.inp. 1 to n

Val.stat.inp. (1353–1 to n)

→ 57

Val.stat.inp.**Navigation**

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

Description

Displays the current input signal level.

User interface

- High
- Low

*"Output values" submenu**Navigation*

Expert → Sensor → Measured val. → Output values

► Output values

► Value curr.out 1 to n

→ 58

► PFS output 1 to n	→ 59
► Relay output 1 to n	→ 60
► Double pulse out	→ 61

"Value current output 1 to n" submenu

Navigation

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

► Value curr.out 1 to n	
Output curr. 1 to n (0361-1 to n)	→ 58
Measur. curr. 1 to n (0366-1 to n)	→ 58

Output curr. 1 to n

Navigation

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

Description

Displays the current value currently calculated for the current output.

User interface

0 to 22.5 mA

Measur. curr. 1 to n

Navigation

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

Description

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

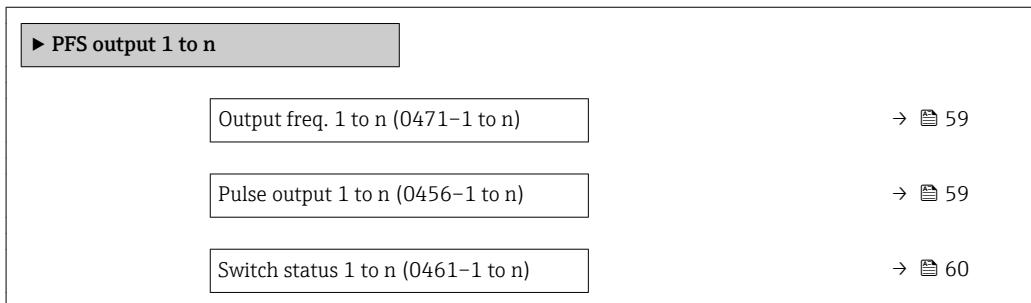
User interface

0 to 30 mA

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

Navigation

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



Output freq. 1 to n

Navigation

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

Prerequisite

In the **Operating mode** parameter (→ 119), the **Frequency** option is selected.

Description

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

User interface

0.0 to 12 500.0 Hz

Pulse output 1 to n

Navigation

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

Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (→ 119) parameter.

Description

Displays the pulse frequency currently output.

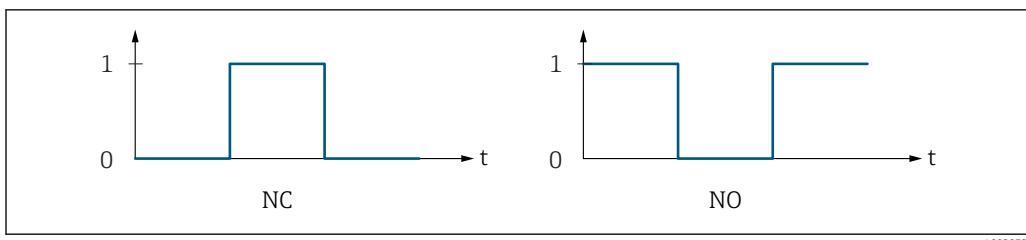
User interface

Positive floating-point number

Additional information

Description

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



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

The output behavior can be reversed via the **Invert outp.sig.** parameter (→ 136) 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 (→ 123)) can be configured.

Switch status 1 to n

Navigation

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

Prerequisite

The **Switch** option is selected in the **Operating mode** parameter (→ 119).

Description

Displays the current switch status of the status output.

User interface

- Open
- Closed

Additional information

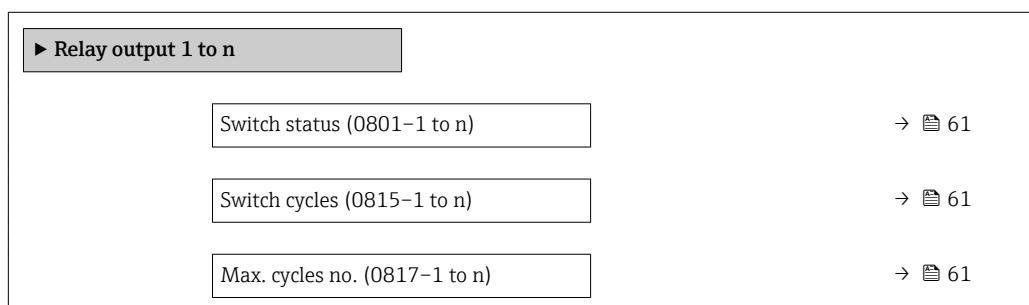
User interface

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

"Relay output 1 to n" submenu

Navigation

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



Switch status

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

Switch cycles

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

Max. cycles no.

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

"Double pulse output" submenu

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

► Double pulse out

Pulse output (0987)

→  62

Pulse output

Navigation

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

Description

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

User interface

Positive floating-point number

Additional information

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

3.2.2 "System units" submenu

Navigation

Expert → Sensor → System units

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

SpecHeatCapaUnit (0604)

→ 73

Date/time format (2812)

→ 73

Volume flow unit



Navigation

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

Description

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

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

Additional information*Result*

The selected unit applies for:

Volume flow parameter (→ 47)

Selection

For an explanation of the abbreviated units: → 213

Customer-specific units

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

Volume unit**Navigation**

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

Description

Use this function to select the unit for the volume.

Selection*SI units*

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

US units

- af
- /af
- ft³
- /ft³
- Mft³
- /MMft³
- fl oz (us)
- /fl oz (us)
- gal (us)
- /gal (us)
- kgal (us)
- /kgal (us)
- Mgal (us)
- /Mgal (us)
- bbl (us;oil)
- /bbl (us;oil)
- bbl (us;liq.)
- /bbl (us;liq.)
- bbl (us;beer)
- /bbl (us;beer)
- bbl (us;tank)
- /bbl (us;tank)

Imperial units

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

Factory setting

Country-specific:

- m³
- ft³

Additional information*Selection*

For an explanation of the abbreviated units: → 213

Cor.volflow unit**Navigation**

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

Description

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

Selection*SI units*

- NI/s
- NI/min
- NI/h
- NI/d
- Nhl/s
- Nhl/min
- Nhl/h
- Nhl/d
- Nm³/s
- Nm³/min
- Nm³/h
- Nm³/d
- Sl/s
- Sl/min
- Sl/h
- Sl/d
- Sm³/s
- Sm³/min
- Sm³/h
- Sm³/d
- MSft³/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.)
- MMSft³/s
- MMSft³/min
- MMSft³/h
- Sbbl/s (us;oil)
- Sbbl/min (us;oil)
- Sbbl/h (us;oil)
- Sbbl/d (us;oil)

Imperial units

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

Factory setting

Country-specific:

- Nm³/h
- Sft³/h

Additional information*Result*

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

Selection

For an explanation of the abbreviated units: → 213

Corr. vol. unit**Navigation**

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

Description

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

Selection	<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
	■ Nl	■ Sft ³	■ Sgal (imp)
	■ /Nl	■ /Sft ³	■ /Sgal (imp)
	■ Nhl	■ MMSft ³	
	■ /Nhl	■ /MMSft ³	
	■ Nm ³	■ Sgal (us)	
	■ /Nm ³	■ /Sgal (us)	
	■ SI	■ Sbbl (us;liq.)	
	■ /SI	■ /Sbbl (us;liq.)	
	■ Sm ³	■ Sbbl (us;oil)	
	■ /Sm ³	■ /Sbbl (us;oil)	
Factory setting	Country-specific:		
	■ Nm ³		
	■ Sft ³		
Additional information	<i>Selection</i>		
	 For an explanation of the abbreviated units: → 213		

Mass flow unit

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

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

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

Factory setting Country-specific:

- kg/h
- lb/h

Additional information *Result*

The selected unit applies for:

Mass flow parameter (→ [48](#))

Selection

 For an explanation of the abbreviated units: → [213](#)

Mass unit**Navigation**

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

Description

Use this function to select the unit for the mass.

Selection*SI units*

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

US units

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

Factory setting

Country-specific:

- kg
- lb

Additional information*Selection*

For an explanation of the abbreviated units: → 213

Velocity unit**Navigation**

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

Description

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

Selection*SI units*

m/s

US units

ft/s

Factory setting

Country-specific:

- m/s
- ft/s

Additional information*Result*

The selected unit applies for:

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

Selection

For an explanation of the abbreviated units: → 213

Temperature unit

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

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

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

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

Additional information	<i>Result</i> The selected unit applies for: Temperature (→ 49) <i>Selection</i> For an explanation of the abbreviated units: → 213
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Pressure unit

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

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

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

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

Additional information	<i>Result</i> The unit is taken from: Process pressure parameter (5640) <i>Selection</i> For an explanation of the abbreviated units: → 213
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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/l
- kg/dm³
- kg/m³
- SD4°C
- SD15°C
- SD20°C
- SG4°C
- SG15°C
- SG20°C

US units

- lb/ft³
- lb/gal (us)
- lb/bbl (us;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/m³
- lb/ft³

Additional information

Selection

For an explanation of the abbreviated units: → [213](#)

Energy unit**Navigation**

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

Description

Use this function to select the unit for energy.

Selection*SI units*

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

Imperial units

- Btu
- MBtu
- MMBtu

Factory setting

Country-specific:

- kWh
- Btu

Additional information

Selection

For an explanation of the abbreviated units: → [213](#)

Dyn. visc. unit

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

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

Selection *SI units*

- cP
- mPa s
- Pa s
- P

Factory setting Pa s

Additional information *Result*

The selected unit applies for:

Dynam. viscosity parameter (gases)

Additional information *Selection*

For an explanation of the abbreviated units: → 213

Cal. value unit

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

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

Selection *SI units*

- kJ/Nm³
- MJ/Nm³
- kWh/Nm³
- kWh/Sm³
- kJ/Sm³

Imperial units

- Btu/Sm³
- MBtu/Sm³
- Btu/Sft³
- MBtu/Sft³

Factory setting Country-specific:

- kWh/Nm³
- Btu/Sft³

Additional information *Result*

The selected unit applies for:

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

Selection

For an explanation of the abbreviated units: → 213

Energy flow unit**Navigation**

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

Description

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

Selection*SI units*

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

Imperial units

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

Factory setting

Country-specific:

- kW
- Btu/h

Additional information*Selection*

For an explanation of the abbreviated units: → [213](#)

Length unit**Navigation**

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

Description

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

Selection*SI units*

- m
- mm
- μm

US units

- ft
- in

Factory setting

Country-specific:

- mm
- in

Additional information*Selection*

For an explanation of the abbreviated units: → [213](#)

SpecHeatCapaUnit**Navigation**

Expert → Sensor → System units → SpecHeatCapaUnit (0604)

Prerequisite

The following conditions are met:

Selected medium:

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

Description

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

Selection*SI units*

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

Imperial units

Btu/(lb°R)

Factory setting

J/(kgK)

Additional information*Result*

The selected unit applies for:

Spec. heat cap. parameter

Selection

For an explanation of the abbreviated units: → 213

**Date/time format**

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

Description

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

Selection

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

Factory setting

dd.mm.yy hh:mm

Additional information*Selection*

For an explanation of the abbreviated units: → 213

3.2.3 "Process param." submenu

Navigation

Expert → Sensor → Process param.

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

Flow override



Navigation

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

Description

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

Selection

- Off
- On

Factory setting

Off

Additional information

Description

Flow override is active

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

i The **Flow override** option can also be activated in the **Status input** submenu: **Assign stat.inp.** parameter (→ 103).

Flow damping



Navigation

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

Description

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

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

User entry 0 to 999.9 s

Factory setting 1 s

Additional information *Description*

 The damping is performed by a PT1 element²⁾.

User entry

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

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

Result

 The damping affects the following variables of the device:

- Outputs → [104](#)
- Low flow cut off → [76](#)
- Totalizers → [165](#)

Gas prop. damp.



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

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

User entry 0 to 999.9 s

Factory setting 1 s

Additional information *Result*

 The damping has an effect on the following outputs:

- Correct.vol.flow (→ [50](#))
- Density (→ [51](#))
- Dry CH₄ in % (→ [50](#))
- Dynam. viscosity (→ [51](#))
- Calorific value (→ [52](#))
- Wobbe index (→ [49](#))
- Energy flow (→ [48](#))

2) Proportional behavior with first-order lag

Temp. damping

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

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

User entry 0 to 999.9 s

Factory setting 10 s

Additional information *Description*

The damping is performed by a PT1 element³⁾.

User entry

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

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

Pressure damping

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

Description Enter value for damping the pressure.

User entry 0 to 999.9 s

Factory setting 0 s

"Low flow cut off" submenu

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

▶ Low flow cut off	
Assign variable (1837)	→ 77
On value (1805)	→ 77
Off value (1804)	→ 77

3) Proportional behavior with first-order lag

Assign variable

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

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

Selection

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

Factory setting Volume flow

On value

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

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

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

User entry Positive floating-point number

Factory setting Depends on country and nominal diameter → [210](#)

Additional information

Dependency

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

Off value

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

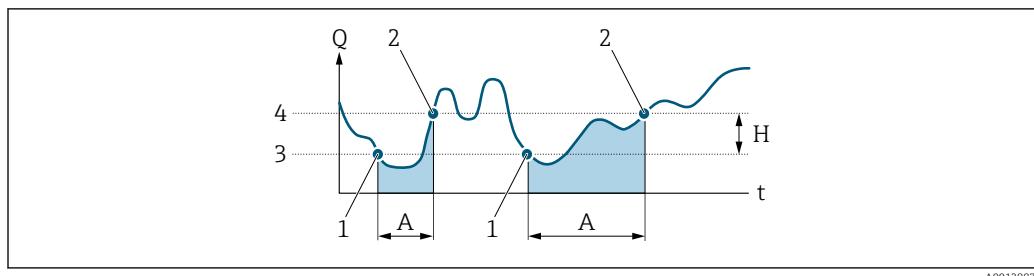
Prerequisite A process variable is selected in the **Assign variable** parameter (→ [77](#)).

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

User entry 0 to 100.0 %

Factory setting 50 %

* Visibility depends on order options or device settings

Additional information*Example*

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

3.2.4 "Measurement mode" submenu

Navigation

Expert → Sensor → Measurement mode

► Measurement mode	
Select gas type (3109)	→ 78
Density calc. (3102)	→ 79
Enthalpy calc. (3103)	→ 79
Ref. conditions (3155)	→ 79
Ref. pressure (3146)	→ 80
Ref. temperature (3147)	→ 80
Ref. comb. temp. (3165)	→ 80
► Medium property	
	→ 81

Select gas type

Navigation

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

Description

Select measured gas type.

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

Factory setting	User-spec. gas
------------------------	----------------

Density calc.

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

Cal.value calc.

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

Ref. conditions

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

* Visibility depends on order options or device settings

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

Factory setting 1013.25hPa, 0°C

Ref. pressure



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

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

Description Select reference conditions for the corrected volume flow.

User entry 0 to 250 bar

Factory setting 1.01325 bar

Ref. temperature



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

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

Description Select reference conditions for the corrected volume flow.

User entry -200 to 450 °C

Factory setting 0 °C

Ref. comb. temp.



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

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

Selection

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

Factory setting

25 °C

"Medium properties" submenu*Navigation*

Expert → Sensor → Measurement mode → Medium property

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

Calorif.val.type**Navigation**

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

Description

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

Selection

- GrossCalorValVol
- NetCalorValVol

Factory setting

GrossCalorValVol

Humidity type

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

Description Select the input value for the gas humidity.

Selection

- Rel. humidity
- Water fraction
- Dew point

Factory setting Depends on the selected gas type.

Ref.density

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

Description Enter fixed value for reference density.

User entry 0.01 to 100 kg/m³

Factory setting 1 kg/m³

Ref. GrossCalVal

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

Description Enter the reference gross calorific value of the gas.

User entry 0 to 1 000 MJ/Nm³

Factory setting 40 MJ/Nm³

Ref. Z-factor

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

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

User entry 0.1 to 2

Factory setting 1

Relative density

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

Spec. heat cap.

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

Calorific value

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

Z-factor

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

Dynam. viscosity

Navigation Expert → Sensor → Measurement mode → Medium property → Dynam. viscosity (3106)

Description Value of the dynamic viscosity for user-specific gas.

User entry 0 to 0.001 Pa s

Factory setting 0.000015 Pa s

Add. gas compon.

Navigation Expert → Sensor → Measurement mode → Medium property → Add. gas compon. (3154)

Prerequisite The **Coal gas/bio gas** option is selected in the **Select gas type** parameter (→ 78).

Description Specify the additional gas component of the gas.

Selection

- None
- Hydrogen H₂
- Hydrot.sulf. H₂S

Factory setting None

St.vol.fl. cal.

Navigation Expert → Sensor → Measurement mode → Medium property → St.vol.fl. cal. (3164)

Prerequisite The **Coal gas/bio gas** option is selected in the **Select gas type** parameter (→ 78).

Description Setting specifying how the corrected volume flow is calculated for wet coal gas/biogas.

Selection

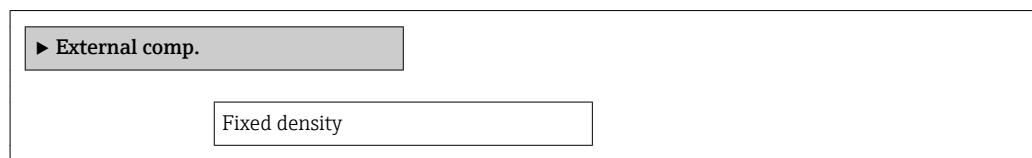
- Wet gas
- Dry gas

Factory setting Dry gas

3.2.5 "External comp." submenu

Navigation

Expert → Sensor → External comp.



Fixed density



Navigation

Expert → Sensor → External comp. → Fixed density (1862)

Description

Use this function to enter a fixed value for the density. The density is used to calculate the mass flow.

User entry

Positive floating-point number

Factory setting

1 000 kg/m³

Additional information

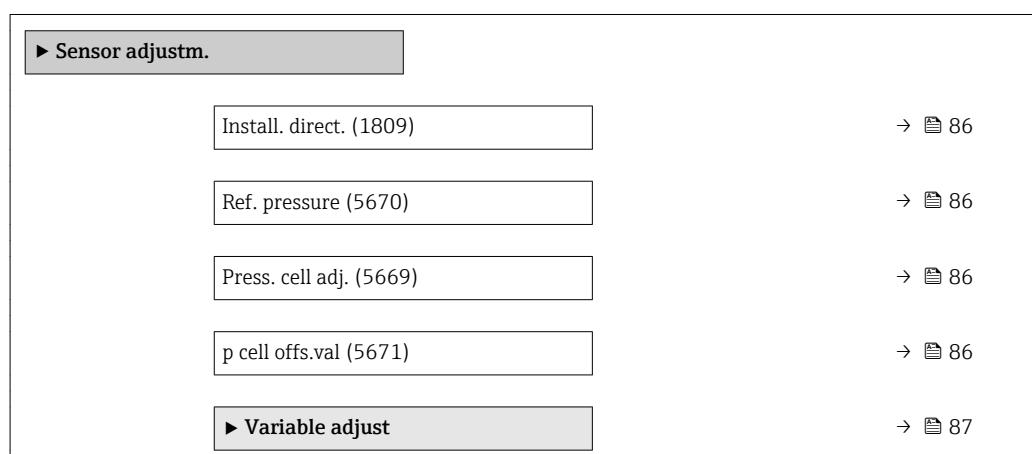
User entry

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

3.2.6 "Sensor adjustm." submenu

Navigation

Expert → Sensor → Sensor adjustm.



Install. direct.**Navigation**

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

Description

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

Selection

- In arrow direct.
- Against arrow

Factory setting

In arrow direct.

Additional information**Description**

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

Ref. pressure**Navigation**

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

Description

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

User entry

Positive floating-point number

Factory setting

1.01325 bar

Press. cell adj.**Navigation**

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

Description

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

Selection

- Yes
- Discard offset
- Cancel

Factory setting

Cancel

p cell offs.val**Navigation**

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

Description

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

User interface Signed floating-point number

Factory setting 0 bar

"Process variable adjustment" submenu

Navigation

Expert → Sensor → Sensor adjustm. → Variable adjust

► Variable adjust	
Vol. flow offset (1831)	→ 88
Vol. flow factor (1832)	→ 88
Corr. vol offset (1855)	→ 89
Corr. vol factor (1856)	→ 89
Mass flow offset (1841)	→ 89
Mass flow factor (1846)	→ 90
S. veloc. offset (1848)	→ 90
S. veloc. factor (1849)	→ 90
Temp. offset (1870)	→ 91
Temp. factor (1871)	→ 91
Pressure offset (1881)	→ 91
Pressure factor (1882)	→ 92
Methane offset (1873)	→ 92
Methane factor (1874)	→ 92
Molar mass offs. (1875)	→ 92
Mol mass factor (1876)	→ 93
Density offset (1877)	→ 93
Density factor (1878)	→ 93
Dyn.visc. offset (1898)	→ 93

Dyn.visc. factor (1897)	→ 94
Cal. val. offs. (1899)	→ 94
Cal. val. fact. (1900)	→ 94
Wobbe index offs (1879)	→ 94
Wobbe index fact (1880)	→ 95
En. flow offset (1866)	→ 95
En. flow factor (1867)	→ 95

Vol. flow offset**Navigation**

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

Description

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

User entry

Signed floating-point number

Factory setting

0 m³/h

Additional information*Description*

Corrected value = (factor × value) + offset

Vol. flow factor**Navigation**

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

Description

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

User entry

Positive floating-point number

Factory setting

1

Additional information*Description*

Corrected value = (factor × value) + offset

Corr. vol offset

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol offset (1855)
Description	Use this function to enter the zero point shift for the temperature trim. The temperature unit on which the shift is based is 1 K.
User entry	Signed floating-point number
Factory setting	0 Sm ³ /h
Additional information	<i>Description</i> Corrected value = (factor × value) + offset

Corr. vol factor

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol factor (1856)
Description	Use this function to enter a quantity factor for the temperature. In each case, this factor refers to the temperature in Kelvin.
User entry	Positive floating-point number
Factory setting	1

Mass flow offset

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Mass flow offset (1841)
Description	Use this function to enter the zero point shift for the mass flow trim. The mass flow unit on which the shift is based is kg/h.
User entry	Signed floating-point number
Factory setting	0 kg/h
Additional information	<i>Description</i> Corrected value = (factor × value) + offset

Mass flow factor**Navigation**

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

Description

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

User entry

Positive floating-point number

Factory setting

1

Additional information*Description*

Corrected value = (factor × value) + offset

S. veloc. offset**Navigation**

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

Description

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

User entry

Signed floating-point number

Factory setting

0 m/s

Additional information*Description*

Corrected value = (factor × value) + offset

S. veloc. factor**Navigation**

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

Description

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

User entry

Positive floating-point number

Factory setting

1

Additional information*Description*

Corrected value = (factor × value) + offset

Temp. offset

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Temp. offset (1870)
Description	Use this function to enter the zero point shift for the temperature trim. The temperature unit on which the shift is based is K.
User entry	Signed floating-point number
Factory setting	0 K
Additional information	<i>Description</i> Corrected value = (factor × value) + offset

Temp. factor

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

Pressure offset

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Pressure offset (1881)
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 1 kg/s.
User entry	Signed floating-point number
Factory setting	0 bar
Additional information	<i>Description</i> Corrected value = (factor × value) + offset

Pressure factor

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Pressure factor (1882)
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

Methane offset

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Methane offset (1873)
Description	Use this function to enter the zero point shift for the methane fraction trim.
User entry	Signed floating-point number
Factory setting	0 %

Methane factor

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Methane factor (1874)
Description	Use this function to enter a quantity factor for the methane fraction.
User entry	Positive floating-point number
Factory setting	1

Molar mass offs.

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Molar mass offs. (1875)
Description	Use this function to enter the zero point shift for the molar mass trim.
User entry	Signed floating-point number
Factory setting	0 g/mol

Mol mass factor

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Mol mass factor (1876)
Description	Use this function to enter a quantity factor for the molar mass.
User entry	Positive floating-point number
Factory setting	1

Density offset

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

Density factor

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

Dyn.visc. offset

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

Dyn.visc. factor

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Dyn.visc. factor (1897)

Description Use this function to enter a quantity factor for the dynamic viscosity.

User entry Positive floating-point number

Factory setting 1

Cal. val. offs.

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

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

User entry Signed floating-point number

Factory setting 0 MJ/Nm³

Cal. val. fact.

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

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

User entry Positive floating-point number

Factory setting 1

Wobbe index offs

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

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

User entry Signed floating-point number

Factory setting 0 MJ/Nm³

Additional information *Description*



Corrected value = (factor × value) + offset

Wobbe index fact

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Wobbe index fact (1880)
Description	Use this function to enter a quantity factor for the Wobbe index factor.
User entry	Positive floating-point number
Factory setting	1
Additional information	<i>Description</i>
	Corrected value = (factor × value) + offset

En. flow offset

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → En. flow offset (1866)
Description	Use this function to enter the zero point shift for the energy flow trim. The energy flow unit on which the shift is based is 1 W.
User entry	Signed floating-point number
Factory setting	0 kW
Additional information	<i>Description</i>
	Corrected value = (factor × value) + offset

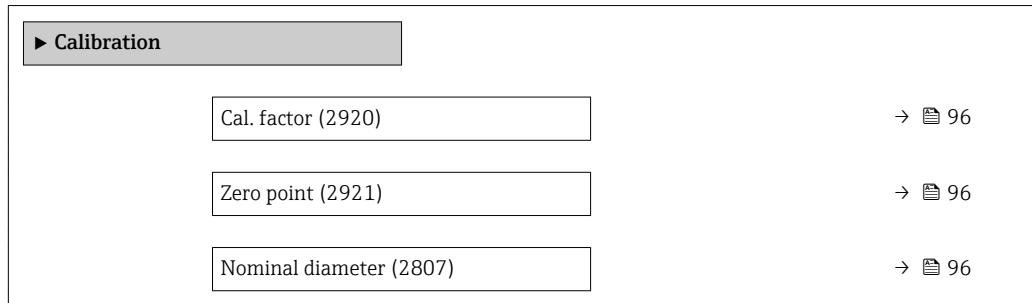
En. flow factor

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → En. flow factor (1867)
Description	Use this function to enter a quantity factor (without time) for the energy flow. This multiplication factor is applied over the energy flow range.
User entry	Positive floating-point number
Factory setting	1
Additional information	<i>Description</i>
	Corrected value = (factor × value) + offset

3.2.7 "Calibration" submenu

Navigation

Expert → Sensor → Calibration



Cal. factor

Navigation

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

Description

Displays the current calibration factor for the sensor.

User interface

Signed floating-point number

Factory setting

1

Zero point

Navigation

Expert → Sensor → Calibration → Zero point (2921)

Description

Displays the current zero point correction value for the sensor.

User interface

Signed floating-point number

Factory setting

0

Nominal diameter

Navigation

Expert → Sensor → Calibration → Nominal diameter (2807)

Description

Displays the nominal diameter of the sensor.

User interface

DNxx / x"

Factory setting

Depends on the size of the sensor

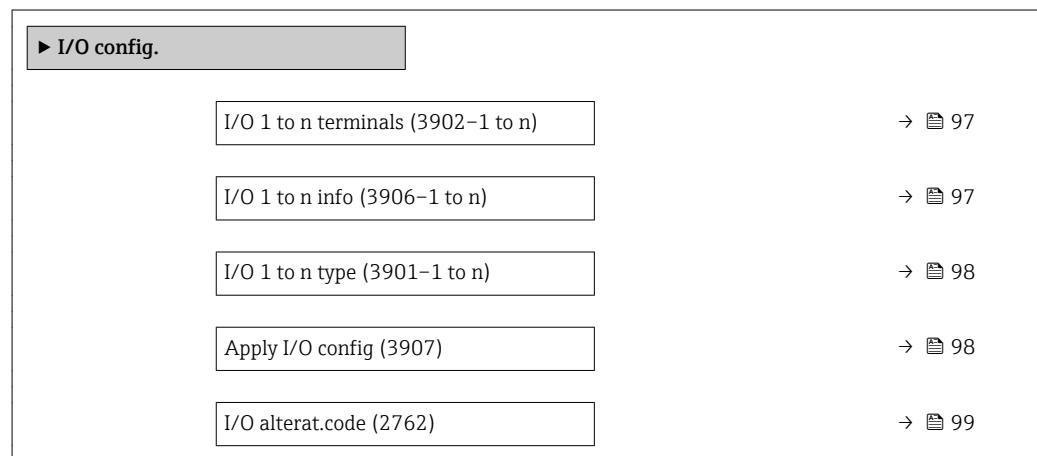
Additional information*Description*

The value is also specified on the sensor nameplate.

3.3 "I/O configuration" submenu

Navigation

Expert → I/O config.



I/O 1 to n terminals

Navigation

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

Description

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

User interface

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

I/O 1 to n info

Navigation

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

Description

Displays information about the plugged in I/O module.

User interface

- Not plugged
- Invalid
- Not configurable
- Configurable
- MODBUS

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

I/O 1 to n type

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

Apply I/O config

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

* Visibility depends on order options or device settings

I/O alterat.code**Navigation**

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

Description

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

User entry Positive integer

Factory setting 0

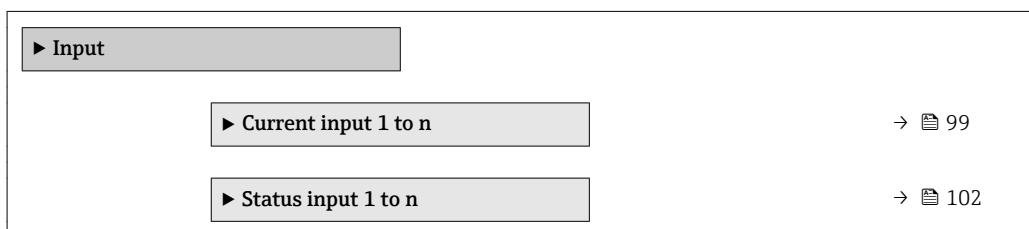
Additional information

Description
The I/O configuration is changed in the **I/O type** parameter (→ 98).

3.4 "Input" submenu

Navigation

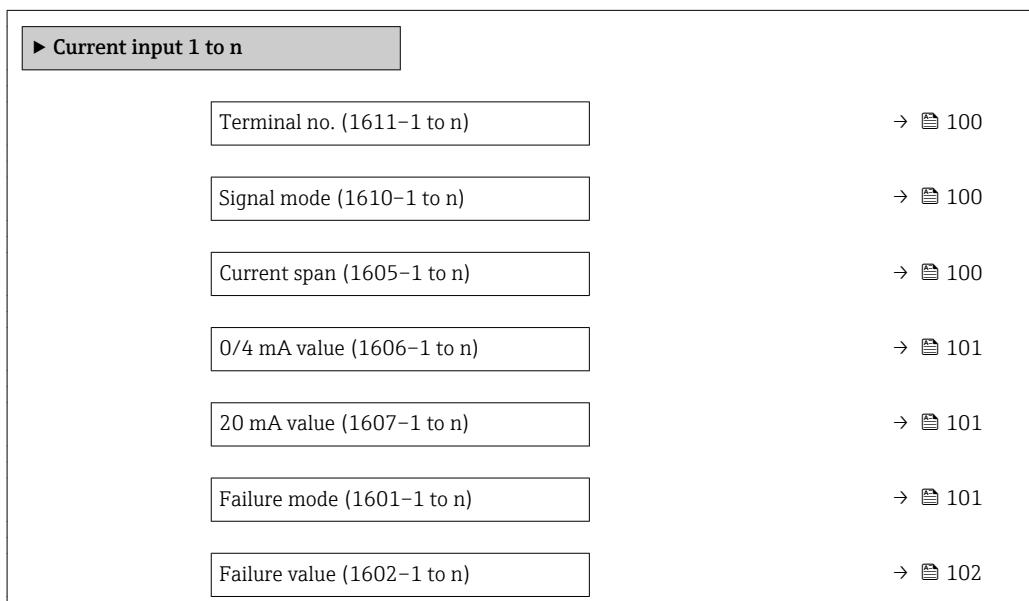
Expert → Input



3.4.1 "Current input 1 to n" submenu

Navigation

Expert → Input → Current input 1 to n



Terminal no.

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

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

User interface

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

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

Signal mode



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

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

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

Selection

- Passive
- Active

Factory setting Active

Current span



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

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

Selection

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

Factory setting Country-specific:

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

Additional information Examples

 Sample values for the current range: **Current span** parameter (→  106)

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	<i>Current input behavior</i> The current input behaves differently depending on the settings configured in the following parameters: <ul style="list-style-type: none">▪ Current span (→ 100)▪ Failure mode (→ 101) <i>Configuration examples</i> Pay attention to the configuration examples for 4 mA value parameter (→ 108).

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	<i>Configuration examples</i> Pay attention to the configuration examples for 4 mA value parameter (→ 108).

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 (→ 100).
Selection	<ul style="list-style-type: none">▪ 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 (→ 102)).

Failure value**Navigation**

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

Prerequisite

In the **Failure mode** parameter (→ 101), the **Defined value** option is selected.

Description

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

User entry

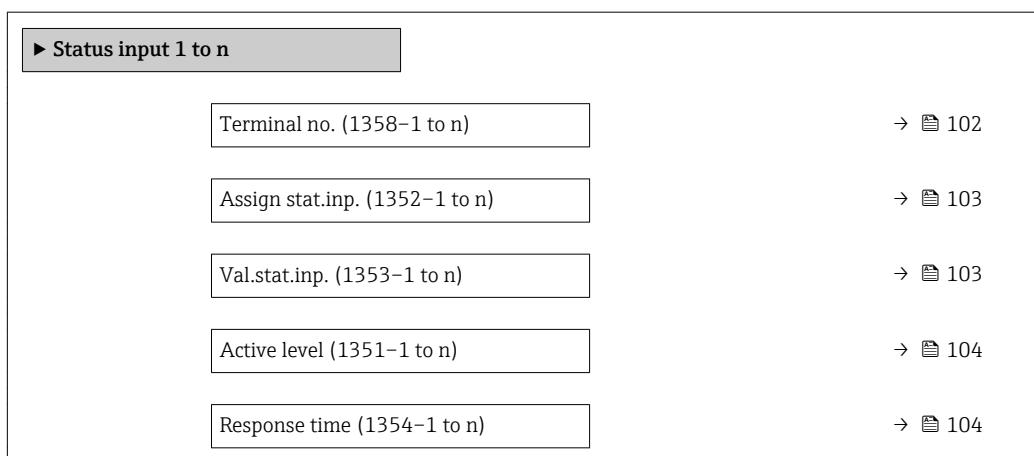
Signed floating-point number

Factory setting

0

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

Expert → Input → Status input 1 to n

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

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

Description

Displays the terminal numbers used by the status input module.

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

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

Assign stat.inp.

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

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

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

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

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

Val.stat.inp.

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

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

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

Active level**Navigation**

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

Description

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

Selection

- High
- Low

Factory setting

High

Response time**Navigation**

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

Description

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

User entry

5 to 200 ms

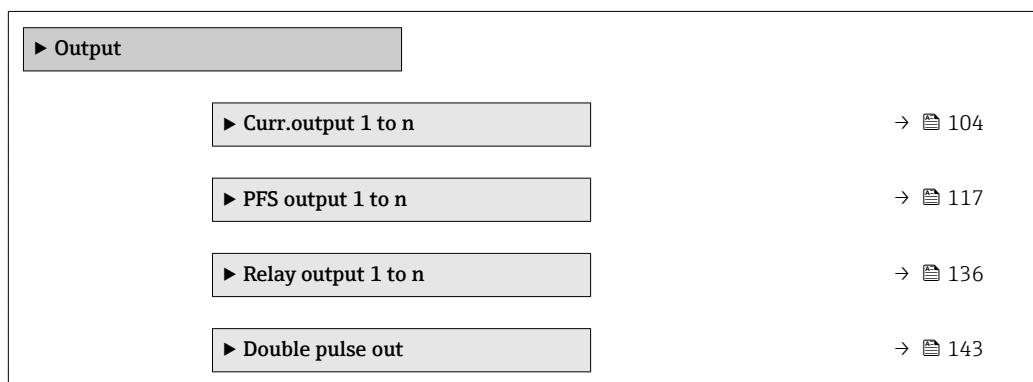
Factory setting

50 ms

3.5 "Output" submenu

Navigation

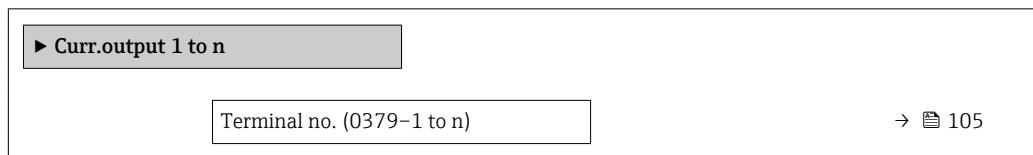
Expert → Output



3.5.1 "Current output 1 to n" submenu

Navigation

Expert → Output → Curr.output 1 to n



Signal mode (0377-1 to n)	→ 105
Assign curr. 1 to n (0359-1 to n)	→ 106
Current span (0353-1 to n)	→ 106
Fixed current (0365-1 to n)	→ 107
0/4 mA value (0367-1 to n)	→ 108
20 mA value (0372-1 to n)	→ 109
Measuring mode (0351-1 to n)	→ 110
Damping out. 1 to n (0363-1 to n)	→ 114
Failure mode (0364-1 to n)	→ 115
Failure current (0352-1 to n)	→ 116
Output curr. 1 to n (0361-1 to n)	→ 117
Measur. curr. 1 to n (0366-1 to n)	→ 117

Terminal no.

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

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

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

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

- Passive
- Active

Factory setting Active

Assign curr. 1 to n



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

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

Selection

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

Factory setting Volume flow

Current span



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

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

Selection

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

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

* Visibility depends on order options or device settings

Additional information*Description*

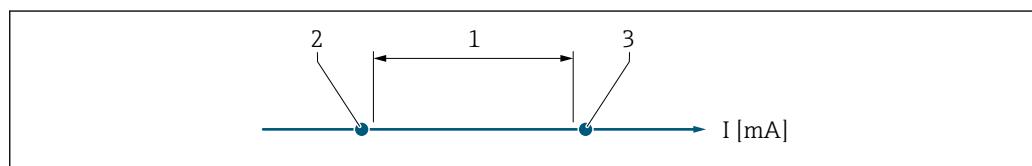
- In the event of a device alarm, the current output adopts the value specified in the **Failure mode** parameter (→ 115).
- If the measured value is outside the measuring range, the diagnostic message **△S441 Curr.output 1 to n** is displayed.
- The measuring range is specified via the **0/4 mA value** parameter (→ 108) and **20 mA value** parameter (→ 109).

"Fixed current" option

The current value is set via the **Fixed current** parameter (→ 107).

Example

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



A0034351

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

Selection

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



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

Fixed current**Navigation**

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

Prerequisite

The **Fixed current** option is selected in the **Current span** parameter (→ 106).

Description

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

User entry

0 to 22.5 mA

Factory setting

22.5 mA

0/4 mA value**Navigation**

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

Prerequisite

In the **Current span** parameter (→ [106](#)), one of the following options is selected:

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

Description

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

User entry

Signed floating-point number

Factory setting

Country-specific:

- m³/h
- ft³/h

Additional information*Description*

Positive and negative values are permitted depending on the process variable assigned in the **Assign curr.** parameter (→ [106](#)). 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 (→ [109](#)).

Dependency

The unit depends on the process variable selected in the **Assign curr.** parameter (→ [106](#)).

Current output behavior

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

- Current span (→ [106](#))
- Failure mode (→ [115](#))

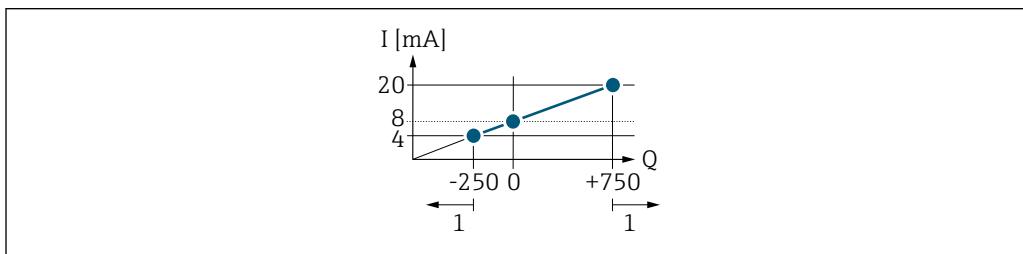
Configuration examples

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

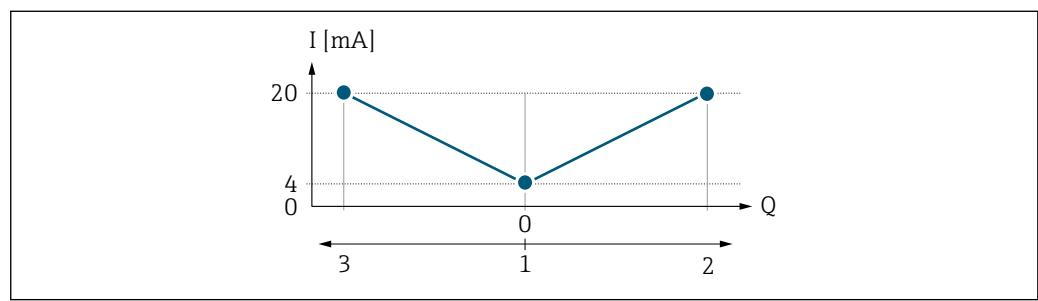
- **0/4 mA value** parameter (→ [108](#)) = not equal to zero flow (e.g. -250 m³/h)
- **20 mA value** parameter (→ [109](#)) = not equal to zero flow (e.g. +750 m³/h)
- Calculated current value = 8 mA at zero flow



The operational range of the measuring device is defined by the values entered for the **0/4 mA value** parameter (→ 108) and **20 mA value** parameter (→ 109). If the effective flow exceeds or falls below this operational range, the diagnostic message **△S441 Curr.output 1 to n** is displayed.

Configuration example B

Measuring mode with **Forward/Reverse** option



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

The current output signal is independent of the direction of flow (absolute amount of the measured variable). The values for the **0/4 mA value** parameter (→ 108) and **20 mA value** parameter (→ 109) must have the same sign. The value for the **20 mA value** parameter (→ 109) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (→ 109) (e.g. forward flow).

Configuration example C

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

If flow is characterized by severe fluctuations (e.g. when using reciprocating pumps), flow components outside the measuring range are buffered, balanced and output after a maximum delay of 60 s → 110.

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 (→ 106):

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

Description

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

User entry

Signed floating-point number

Factory setting

Depends on country and nominal diameter

Additional information

Description

Positive and negative values are permitted depending on the process variable assigned in the **Assign curr.** parameter (→ 106). 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 (→ [108](#)).

Dependency

 The unit depends on the process variable selected in the **Assign curr.** parameter (→ [106](#)).

Example

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

If the **Forward/Reverse** option is selected in the **Measuring mode** parameter (→ [110](#)), different signs cannot be entered for the values of the **0/4 mA value** parameter (→ [108](#)) and **20 mA value** parameter (→ [109](#)). The diagnostic message **△S441 Curr.output 1 to n** is displayed.

Configuration examples

 Observe the configuration examples for the **0/4 mA value** parameter (→ [108](#)).

Measuring mode



Navigation

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

Prerequisite

In the **Current span** parameter (→ [106](#)), one of the following options is selected:

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

Description

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

Selection

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

Factory setting

Forward flow

Additional information

Description

 The process variable that is assigned to the current output via the **Assign curr.** parameter (→ [106](#)) is displayed below the parameter.

"Forward flow" option

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

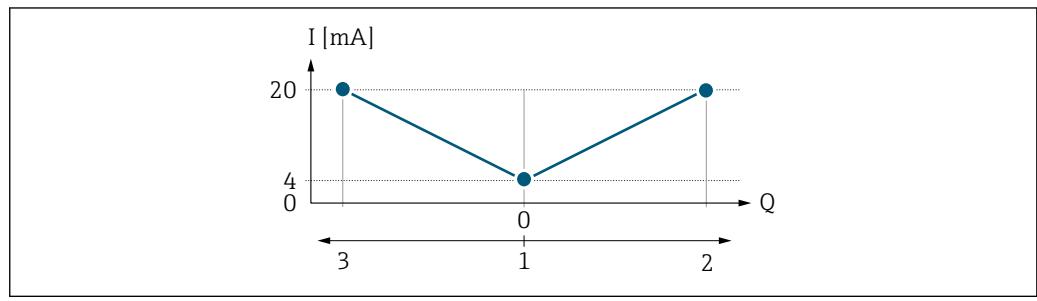
* Visibility depends on order options or device settings

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

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

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

"Forward/Reverse" option



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

- The current output signal is independent of the direction of flow (absolute amount of the measured variable). The values for the **0/4 mA value** parameter (→ 108) and **20 mA value** parameter (→ 109) must have the same sign.
- The value for the **20 mA value** parameter (→ 109) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (→ 109) (e.g. forward flow).

"Rev. flow comp." option

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

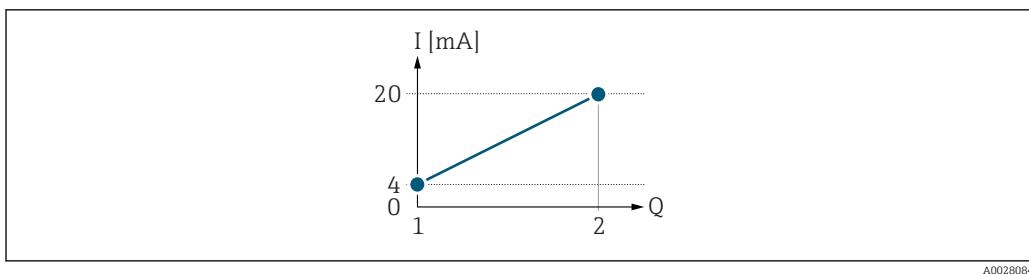
Flow values can aggregate in the buffer in the event of prolonged and unwanted fluid reverse flow. However, these flows are not taken into consideration by the current output configuration, i.e. the reverse flow is not compensated.

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

Examples of how the current output behaves

Example 1

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



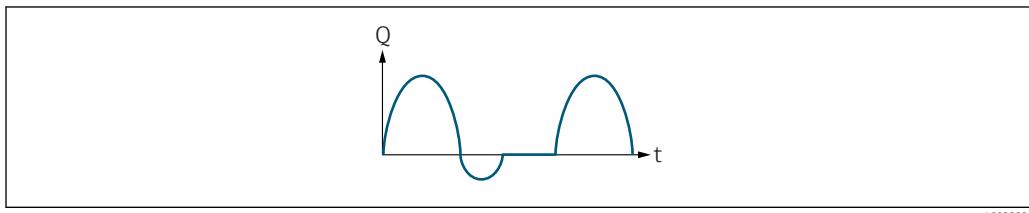
A0028084

Fig 3 Measuring range I Current Q Flow

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

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

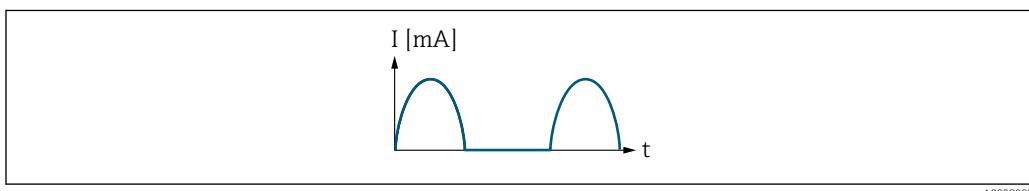
With the following flow response:



A0028091

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

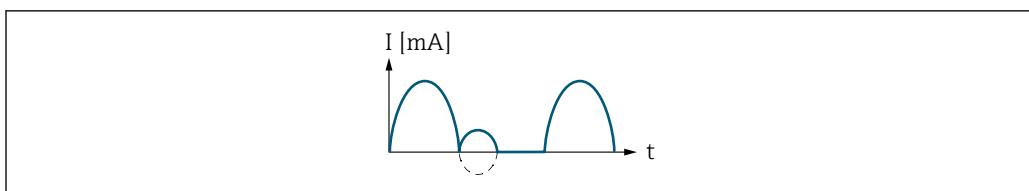
The current output signal is proportional to the process variable assigned. The flow components outside the scaled measuring range are not taken into account for signal output:



A0028092

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

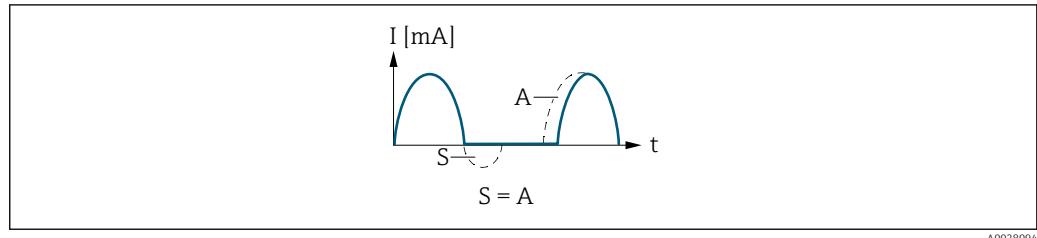
The current output signal is independent of the direction of flow.



A0028093

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

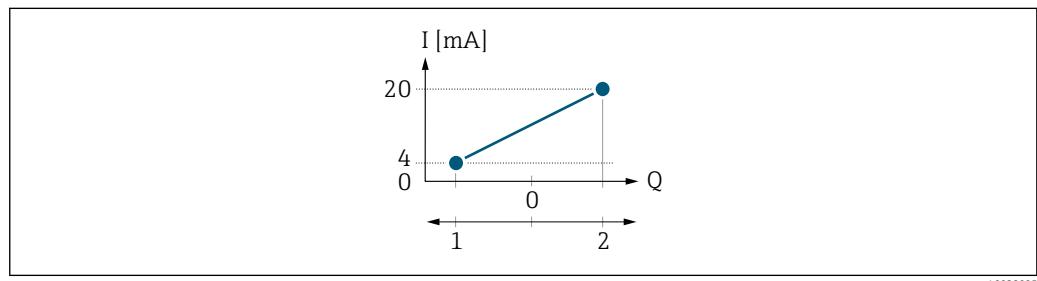
Flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.



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

Example 2

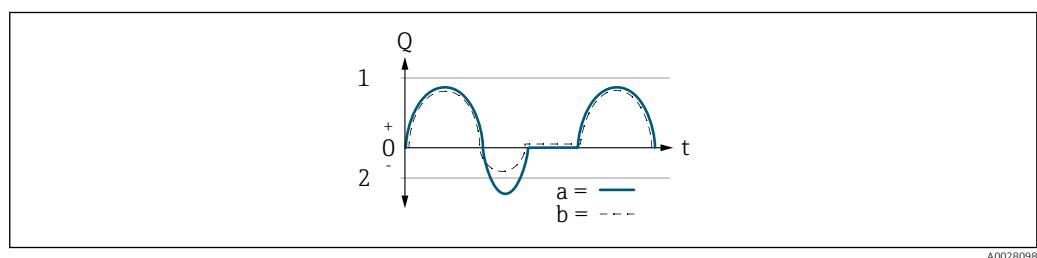
Defined measuring range: lower range value and upper range value with **different** signs



■ 5 Measuring range

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

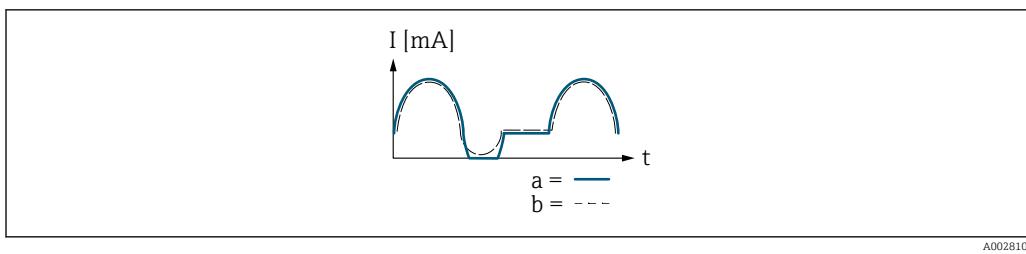
With flow a (–) outside, b (---) inside the measuring range



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

With **Forward flow** option

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



I Current
 t Time

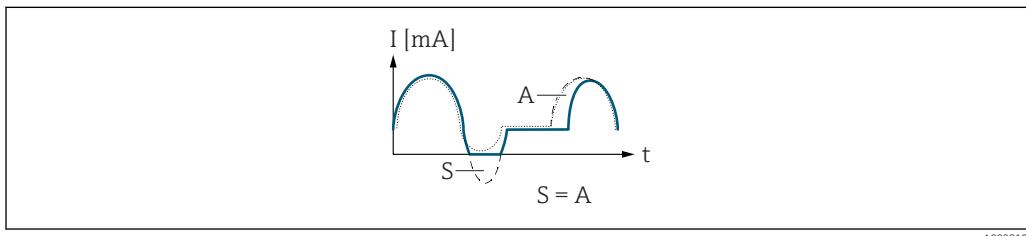
A0028100

With Forward/Reverse option

This option is not possible in this case as the values for the **0/4 mA value** parameter (\rightarrow 108) and **20 mA value** parameter (\rightarrow 109) have different signs.

With Rev. flow comp. option

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



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

A0028101

Damping out. 1 to n



Navigation

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

Prerequisite

A process variable is selected in the **Assign curr.** parameter (\rightarrow 106) and one of the following options is selected in the **Current span** parameter (\rightarrow 106):

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

Description

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

User entry

0.0 to 999.9 s

Factory setting

1.0 s

Additional information*User entry*

Use this function to enter a time constant (PT1 element⁴⁾) for current output damping:

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



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

Response time**Navigation**

Diagram: Expert → Output → Curr.output 1 to n → Response time

Prerequisite

One of the following options is selected in the **Current span** parameter (→ [106](#)):

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

Description

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

User interface

Positive floating-point number

Additional information*Description*

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

- Current output damping → [114](#)
and
- Depending on the measured variable assigned to the output.
Flow damping

Failure mode**Navigation**

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

Prerequisite

A process variable is selected in the **Assign curr.** parameter (→ [106](#)) and one of the following options is selected in the **Current span** parameter (→ [106](#)):

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

Description

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

4) proportional transmission behavior with first order delay

Selection

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

Factory setting

Max.

Additional information*Description*

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

"Min." option

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

 The signal on alarm level is defined via the **Current span** parameter (→ 106).

"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 (→ 106).

"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 (→ 116).

Failure current**Navigation**

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

Prerequisite

The **Defined value** option is selected in the **Failure mode** parameter (→ 115).

Description

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

User entry

0 to 22.5 mA

Factory setting

22.5 mA

Output curr. 1 to n

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

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

User interface 3.59 to 22.5 mA

Measur. curr. 1 to n

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

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

User interface 0 to 30 mA

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

Navigation

Expert → Output → PFS output 1 to n

► PFS output 1 to n	
Terminal no. (0492–1 to n)	→ 118
Signal mode (0490–1 to n)	→ 119
Operating mode (0469–1 to n)	→ 119
Assign pulse 1 to n (0460–1 to n)	→ 121
Pulse scaling (0455–1 to n)	→ 121
Pulse width (0452–1 to n)	→ 122
Measuring mode (0457–1 to n)	→ 122
Failure mode (0480–1 to n)	→ 123
Pulse output 1 to n (0456–1 to n)	→ 124
Assign freq. (0478–1 to n)	→ 124
Min. freq. value (0453–1 to n)	→ 125

Max. freq. value (0454-1 to n)	→ 125
Val. at min.freq (0476-1 to n)	→ 126
Val. at max.freq (0475-1 to n)	→ 126
Measuring mode (0479-1 to n)	→ 126
Damping out. 1 to n (0477-1 to n)	→ 127
Response time (0491-1 to n)	→ 127
Failure mode (0451-1 to n)	→ 128
Failure freq. (0474-1 to n)	→ 128
Output freq. 1 to n (0471-1 to n)	→ 129
Switch out funct (0481-1 to n)	→ 129
Assign diag. beh (0482-1 to n)	→ 130
Assign limit (0483-1 to n)	→ 130
Switch-on value (0466-1 to n)	→ 132
Switch-off value (0464-1 to n)	→ 133
Assign dir.check (0484-1 to n)	→ 133
Assign status (0485-1 to n)	→ 134
Switch-on delay (0467-1 to n)	→ 134
Switch-off delay (0465-1 to n)	→ 134
Failure mode (0486-1 to n)	→ 135
Switch status 1 to n (0461-1 to n)	→ 135
Invert outp.sig. (0470-1 to n)	→ 136

Terminal no.

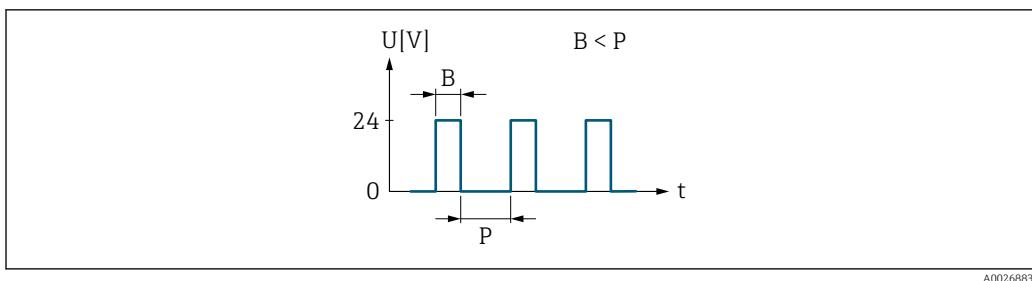
Navigation

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

Description

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

User interface	<ul style="list-style-type: none">■ Not used■ 24-25 (I/O 2)■ 22-23 (I/O 3)
Additional information	<p><i>"Not used" option</i></p> <p>The pulse/frequency/switch output module does not use any terminal numbers.</p>
<hr/>	
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	<ul style="list-style-type: none">■ Passive■ Active■ Passive NAMUR
Factory setting	Passive
<hr/>	
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	<ul style="list-style-type: none">■ Pulse■ Frequency■ Switch
Factory setting	Pulse
Additional information	<p><i>"Pulse" option</i></p> <p>Quantity-dependent pulse with configurable pulse width</p> <ul style="list-style-type: none">■ Whenever a specific volume or 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. <p>Example</p> <ul style="list-style-type: none">■ Flow rate approx. 100 g/s■ Pulse value 0.1 g■ Pulse width 0.05 ms■ Pulse rate 1 000 Impuls/s



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

B Pulse width entered

P Pauses between the individual pulses

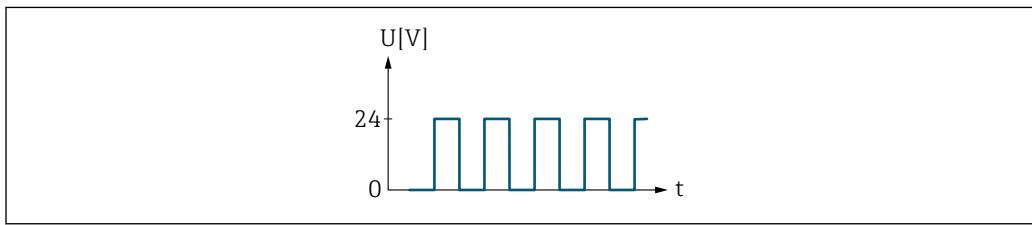
"Frequency" option

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

An output frequency is output that is proportional to the value of a process variable, such as volume flow, mass flow, temperature, sound velocity, flow velocity, acceptance rate, flow asymmetry, turbulence, signal strength or signal-to-noise ratio.

Example

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



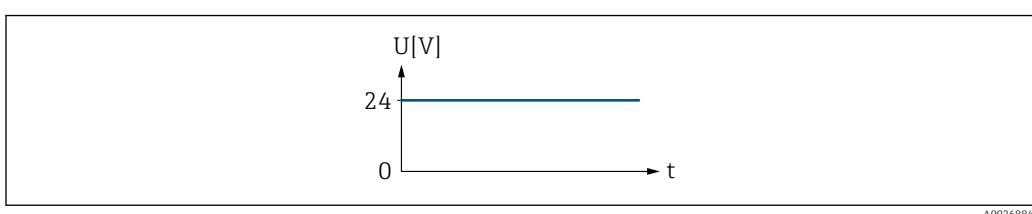
■ 7 Flow-proportional frequency output

"Switch" option

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

Example

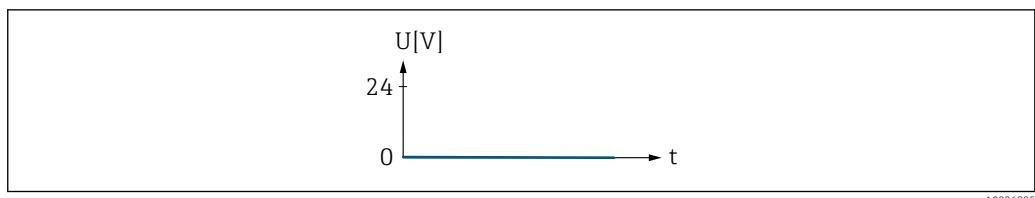
Alarm response without alarm



■ 8 No alarm, high level

Example

Alarm response in case of alarm



A0026885

9 Alarm, low level

Assign pulse 1 to n**Navigation**

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

Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (→ 119) parameter.

Description

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

Selection

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

Factory setting

Off

Pulse scaling**Navigation**

Expert → Output → PFS output 1 to n → Pulse scaling (0455–1 to n)

Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (→ 119) and a process variable is selected in the **Assign pulse** parameter (→ 121).

Description

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

User entry

Positive floating point number

Factory setting

Depends on country and nominal diameter → 210

Additional information

User entry

Weighting of the pulse output with a quantity.

The lower the pulse value, the

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

* Visibility depends on order options or device settings

Pulse width**Navigation**

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

Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (→ 119) and a process variable is selected in the **Assign pulse** parameter (→ 121).

Description

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

User entry

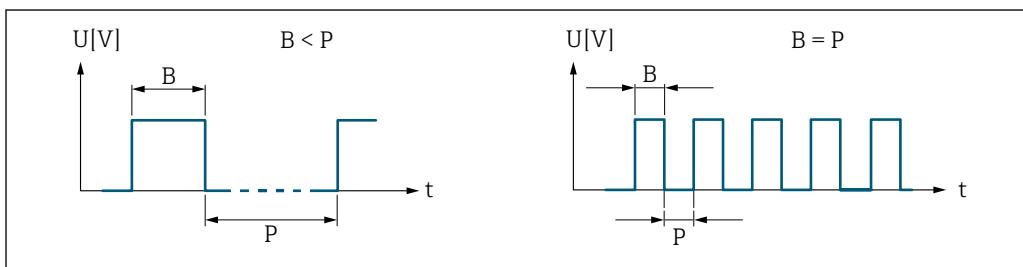
0.05 to 2 000 ms

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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B Pulse width entered
P Pauses between the individual pulses

Example

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

Measuring mode**Navigation**

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

Description

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

Selection

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

Factory setting

Forward flow

Additional information*Selection*

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

 For a detailed description of the options available, see the **Measuring mode** parameter (→ 110)

Examples

 For a detailed description of the configuration examples, see the **Measuring mode** parameter (→ 110)

Failure mode**Navigation**

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

Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (→ 119) and a process variable is selected in the **Assign pulse** parameter (→ 121).

Description

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

Selection

- Actual value
- No pulses

Factory setting

No pulses

Additional information*Description*

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

Selection

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

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

Pulse output 1 to n

Navigation

Expert → Output → PFS output 1 to n → Pulse output 1 to n (0456–1 to n)

Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (→ [119](#)) parameter.

Description

Displays the pulse frequency currently output.

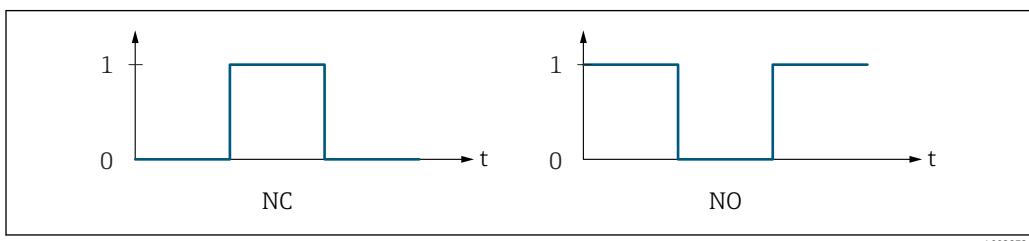
User interface

Positive floating-point number

Additional information

Description

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



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

The output behavior can be reversed via the **Invert outp.sig.** parameter (→ [136](#)) 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 (→ [123](#))) can be configured.

Assign freq.



Navigation

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

Prerequisite

The **Frequency** option is selected in the **Operating mode** parameter (→ [119](#)).

Description

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

Selection

- Off
- Volume flow
- Correct.vol.flow *
- Mass flow
- Flow velocity
- Sound velocity *
- Temperature *
- Pressure *
- Methane fraction *

* Visibility depends on order options or device settings

- Molar mass *
- Density *
- Dynam. viscosity *
- Calorific value *
- Wobbe index *
- Energy flow *
- Signal strength *
- SNR *
- Acceptance rate *
- Turbulence *
- Flow asymmetry *
- Electronic temp.

Factory setting Off

Min. freq. value



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

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (→ 119) and a process variable is selected in the **Assign freq.** parameter (→ 124).

Description Use this function to enter the minimum frequency.

User entry 0.0 to 10 000.0 Hz

Factory setting 0.0 Hz

Max. freq. value



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

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (→ 119) and a process variable is selected in the **Assign freq.** parameter (→ 124).

Description Use this function to enter the end value frequency.

User entry 0.0 to 10 000.0 Hz

Factory setting 10 000.0 Hz

* Visibility depends on order options or device settings

Val. at min.freq



Navigation

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

Prerequisite

The **Frequency** option is selected in the **Operating mode** parameter (→ 119) and a process variable is selected in the **Assign freq.** parameter (→ 124).

Description

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

User entry

Signed floating-point number

Factory setting

Depends on country and nominal diameter

Additional information

Dependency

The entry depends on the process variable selected in the **Assign freq.** parameter (→ 124).

Val. at max.freq



Navigation

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

Prerequisite

The **Frequency** option is selected in the **Operating mode** parameter (→ 119) and a process variable is selected in the **Assign freq.** parameter (→ 124).

Description

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

User entry

Signed floating-point number

Factory setting

Depends on country and nominal diameter

Additional information

Description

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

Dependency

The entry depends on the process variable selected in the **Assign freq.** parameter (→ 124).

Measuring mode



Navigation

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

Description

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

Selection

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

Factory setting Forward flow

Additional information *Selection*

 For a detailed description of the options available, see the **Measuring mode** parameter (→ 110)

Examples

 For a detailed description of the configuration examples, see the **Measuring mode** parameter (→ 110)



Damping out. 1 to n

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

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

User entry 0 to 999.9 s

Factory setting 0.0 s

Additional information *User entry*

Use this function to enter a time constant (PT1 element⁵⁾) for frequency output damping:

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

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

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

Response time

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

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

User interface Positive floating-point number

5) proportional transmission behavior with first order delay

Additional information*Description*

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

- Damping of pulse/frequency/switch output → [114](#)
and
- Depending on the measured variable assigned to the output.
 - Flow damping
or
 - Temperature damping

Failure mode**Navigation**

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

Prerequisite

The **Frequency** option is selected in the **Operating mode** parameter (→ [119](#)) and a process variable is selected in the **Assign freq.** parameter (→ [124](#)).

Description

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

Selection

- Actual value
- Defined value
- 0 Hz

Factory setting

0 Hz

Additional information*Selection*

- Actual value

In the event of a device alarm, the frequency output continues on the basis of the current flow measurement. The device alarm is ignored.

- Defined value

In the event of a device alarm, the frequency output continues on the basis of a predefined value. The Failure freq. (→ [128](#)) replaces the current measured value, making it possible to bypass the device alarm. The actual measurement is switched off for the duration of the device alarm.

- 0 Hz

In the event of a device alarm, the frequency output is "switched off".

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

Failure freq.**Navigation**

Expert → Output → PFS output 1 to n → Failure freq. (0474–1 to n)

Prerequisite

The **Frequency** option is selected in the **Operating mode** parameter (→ [119](#)) and a process variable is selected in the **Assign freq.** parameter (→ [124](#)).

Description

Use this function to enter the value for the frequency output in the event of a device alarm in order to bypass the alarm.

User entry 0.0 to 12 500.0 Hz

Factory setting 0.0 Hz

Output freq. 1 to n

Navigation  Expert → Output → PFS output 1 to n → Output freq. 1 to n (0471-1 to n)

Prerequisite In the **Operating mode** parameter (→ [119](#)), the **Frequency** option is selected.

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

User interface 0.0 to 12 500.0 Hz

Switch out funct



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

Prerequisite The **Switch** option is selected in the **Operating mode** parameter (→ [119](#)).

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

Selection

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

Factory setting Off

Additional information *Selection*

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

Assign diag. beh



Navigation

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

Prerequisite

- In the **Operating mode** parameter (→ 119), the **Switch** option is selected.
- In the **Switch out funct** parameter (→ 129), the **Diag. behavior** option is selected.

Description

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

Selection

- Alarm
- Alarm or warning
- Warning

Factory setting

Alarm

Additional information

Description

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

Selection

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

Assign limit



Navigation

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

Prerequisite

- The **Switch** option is selected in the **Operating mode** parameter (→ 119).
- The **Limit** option is selected in the **Switch out funct** parameter (→ 129).

Description

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

Selection

- Off
- Volume flow
- Correct.vol.flow *
- Mass flow
- Flow velocity
- Sound velocity *
- Temperature *
- Pressure *
- Methane fraction *
- Molar mass *
- Density *
- Dynam. viscosity *
- Calorific value *

* Visibility depends on order options or device settings

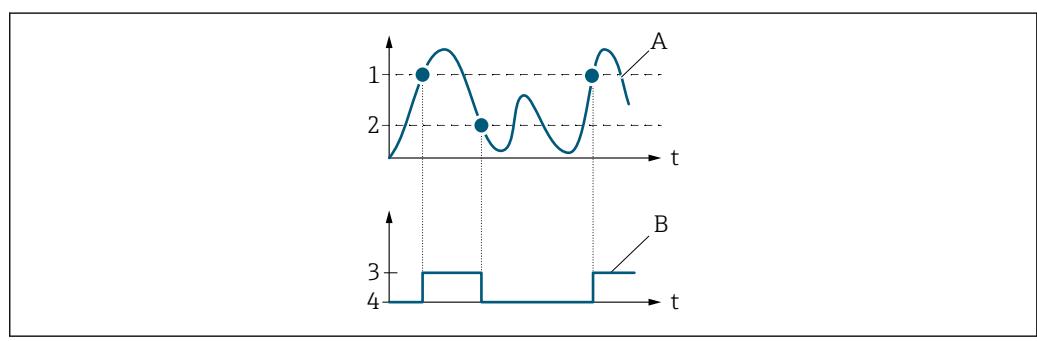
- Wobbe index *
- Energy flow *
- Signal strength *
- SNR *
- Acceptance rate *
- Turbulence
- Flow asymmetry *
- Electronic temp.
- Totalizer 1
- Totalizer 2
- Totalizer 3

Factory setting Volume flow

Additional information *Description*

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

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

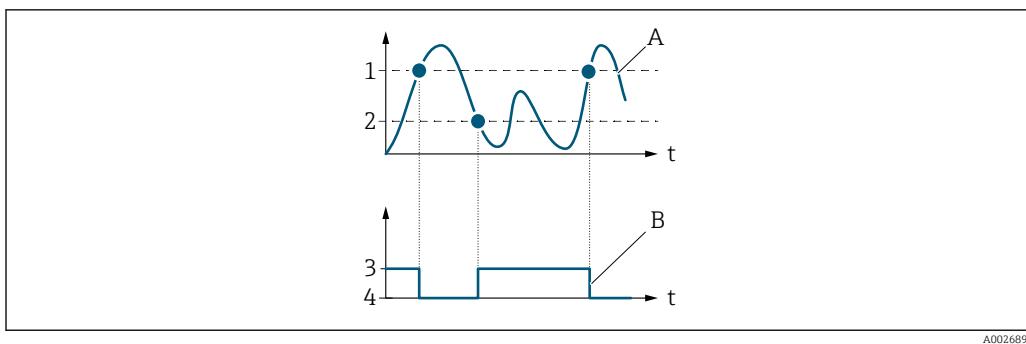


- | | |
|---|------------------|
| 1 | Switch-on value |
| 2 | Switch-off value |
| 3 | Conductive |
| 4 | Non-conductive |
| A | Process variable |
| B | Status output |

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

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

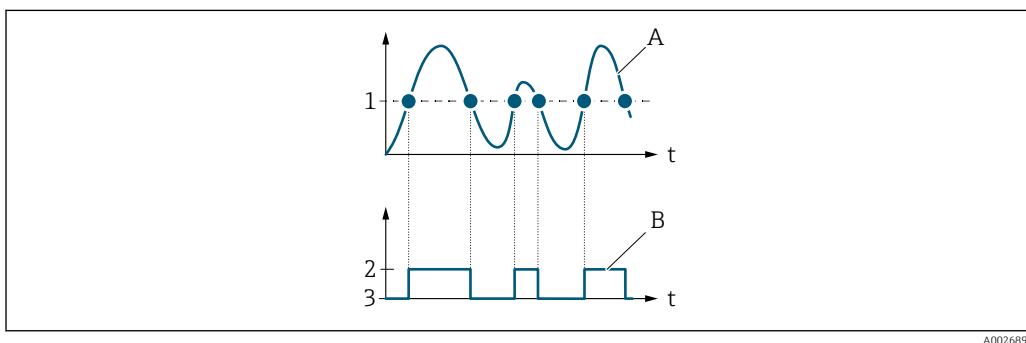
* Visibility depends on order options or device settings



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

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

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



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

Switch-on value



Navigation

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

Prerequisite

- The **Switch** option is selected in the **Operating mode** parameter (→ [A 119](#)).
- The **Limit** option is selected in the **Switch out funct** parameter (→ [A 129](#)).

Description

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

User entry

Signed floating-point number

Factory setting

Country-dependent

Additional information*Description*

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



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

Dependency

The unit depends on the process variable selected in the **Assign limit** parameter (→ 130).

Switch-off value**Navigation**

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

Prerequisite

- The **Switch** option is selected in the **Operating mode** parameter (→ 119).
- The **Limit** option is selected in the **Switch out funct** parameter (→ 129).

Description

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

User entry

Signed floating-point number

Factory setting

Country-dependent

Additional information*Description*

Use this function to enter the limit value for the switch-off value (process variable < switch-off value = open, non-conductive).



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

Dependency

The unit depends on the process variable selected in the **Assign limit** parameter (→ 130).

Assign dir.check**Navigation**

Expert → Output → PFS output 1 to n → Assign dir.check (0484-1 to n)

Prerequisite

- The **Switch** option is selected in the **Operating mode** parameter (→ 119).
- The **Fl. direct.check** option is selected in the **Switch out funct** parameter (→ 129).

Description

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

Selection

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

* Visibility depends on order options or device settings

- Mass flow
- Flow velocity*
- Energy flow*

Factory setting Volume flow

Assign status



Navigation Expert → Output → PFS output 1 to n → Assign status (0485-1 to n)

Prerequisite

- The **Switch** option is selected in the **Operating mode** parameter (→ [119](#)).
- The **Status** option is selected in the **Switch out funct** parameter (→ [129](#)).

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

Selection

- Off
- Low flow cut off

Factory setting Low flow cut off

Additional information *Options*

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

Switch-on delay



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

Prerequisite

- The **Switch** option is selected in the **Operating mode** parameter (→ [119](#)).
- The **Limit** option is selected in the **Switch out funct** parameter (→ [129](#)).

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 (→ [119](#)).
- The **Limit** option is selected in the **Switch out funct** parameter (→ [129](#)).

* Visibility depends on order options or device settings

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	<ul style="list-style-type: none"> ▪ Actual status ▪ Open ▪ Closed
Factory setting	Open
Additional information	<p><i>Options</i></p> <ul style="list-style-type: none"> ▪ 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 (→ 119).
Description	Displays the current switch status of the status output.
User interface	<ul style="list-style-type: none"> ▪ Open ▪ Closed
Additional information	<p><i>User interface</i></p> <ul style="list-style-type: none"> ▪ Open The switch output is not conductive. ▪ Closed The switch output is conductive.

Invert outp.sig.**Navigation**

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

Description

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

Selection

- No
- Yes

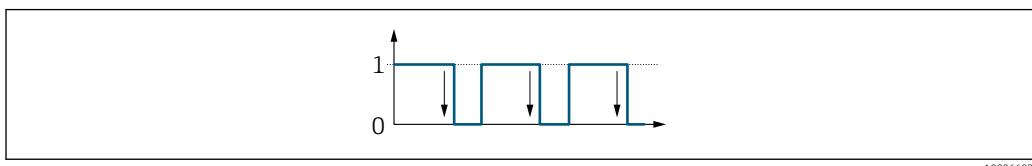
Factory setting

No

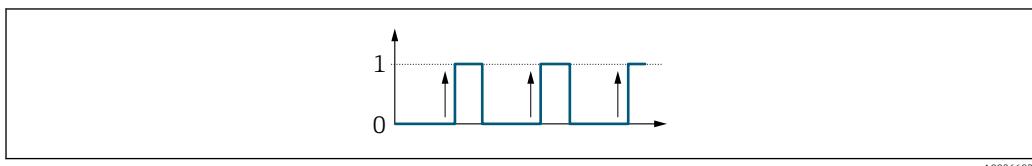
Additional information

Selection

No option (passive - negative)



Yes option (passive - positive)



3.5.3 "Relay output 1 to n" submenu

Navigation

Expert → Output → Relay output 1 to n

► Relay output 1 to n	
Terminal no.	→ 137
Relay outp.func.	→ 137
Assign dir.check	→ 138
Assign limit	→ 138
Assign diag. beh	→ 139
Assign status	→ 140
Switch-off value	→ 140

Switch-off delay	→ 140
Switch-on value	→ 141
Switch-on delay	→ 141
Failure mode	→ 141
Switch status	→ 142
Powerless relay	→ 142

Terminal no.

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

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

User interface

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

Additional information "Not used" option
The relay output module does not use any terminal numbers.

Relay outp.func.



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

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

Selection

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

Factory setting Closed

Additional information*Selection*

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

Assign dir.check**Navigation**

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

Prerequisite

In the **Relay outp.func.** parameter (→ 137), the **Fl. direct.check** option is selected.

Description

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

Selection

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

Factory setting

Volume flow

Assign limit**Navigation**

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

Prerequisite

The **Limit** option is selected in the **Relay outp.func.** parameter (→ 137).

Description

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

Selection

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

* Visibility depends on order options or device settings

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

Factory setting Volume flow

Assign diag. beh



Navigation Expert → Output → Relay output 1 to n → Assign diag. beh (0806-1 to n)

Prerequisite In the **Relay outp.func.** parameter (→ 137), the **Diag. behavior** option is selected.

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

Selection

- Alarm
- Alarm or warning
- Warning

Factory setting Alarm

Additional information *Description*

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

Selection

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

* Visibility depends on order options or device settings

Assign status

Navigation	Expert → Output → Relay output 1 to n → Assign status (0805–1 to n)
Prerequisite	In the Relay outp.func. parameter (→ 137), the Digital Output option is selected.
Description	Use this function to select the device status for the relay output.
Selection	<ul style="list-style-type: none">■ Off■ Low flow cut off
Factory setting	Off

Switch-off value

Navigation	Expert → Output → Relay output 1 to n → Switch-off value (0809–1 to n)
Prerequisite	In the Relay outp.func. parameter (→ 137), 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	0 m ³ /h
Additional information	<i>Description</i> Use this function to enter the limit value for the switch-off value (process variable < switch-off value = open, non-conductive). When using a hysteresis: Switch-on value > Switch-off value.
	<i>Dependency</i> The unit is dependent on the process variable selected in the Assign limit parameter (→ 138).

Switch-off delay

Navigation	Expert → Output → Relay output 1 to n → Switch-off delay (0813–1 to n)
Prerequisite	In the Relay outp.func. parameter (→ 137), 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 The **Limit** option is selected in the **Relay outp.func.** parameter (→ [137](#)).

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

User entry Signed floating-point number

Factory setting 0 m³/h

Additional information *Description*

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

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

Dependency

The unit is dependent on the process variable selected in the **Assign limit** parameter (→ [138](#)).

Switch-on delay

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

Prerequisite In the **Relay outp.func.** parameter (→ [137](#)), the **Limit** option is selected.

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

User entry 0.0 to 100.0 s

Factory setting 0.0 s

Failure mode

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

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

Selection

- Actual status
- Open
- Closed

Factory setting Open

Additional information*Selection*

■ Actual status

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

■ Open

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

■ Closed

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

Switch status

Navigation  Expert → Output → Relay output 1 to n → Switch status (0801-1 to n)**Description**

Displays the current status of the relay output.

User interface

- Open
- Closed

Additional information*User interface*

■ Open

The relay output is not conductive.

■ Closed

The relay output is conductive.

Powerless relay

**Navigation**  Expert → Output → Relay output 1 to n → Powerless relay (0816-1 to n)**Description**

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

Selection

- Open
- Closed

Factory setting

Open

Additional information*Selection*

■ Open

The relay output is not conductive.

■ Closed

The relay output is conductive.

3.5.4 "Double pulse output" submenu

Navigation

Expert → Output → Double pulse out

► Double pulse out	
Master term. no. (0981)	→ 143
Slave term. no. (0990)	→ 143
Signal mode (0991)	→ 144
Assign pulse 1 (0982-1)	→ 144
Value per pulse (0983)	→ 144
Pulse width (0986)	→ 145
Phase shift (0992)	→ 145
Measuring mode (0984)	→ 145
Failure mode (0985)	→ 146
Pulse output (0987)	→ 147
Invert outp.sig. (0993)	→ 147

Master term. no.

Navigation

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

Description

Displays the master terminal number for the double pulse output.

User interface

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

Additional information

"Not used" option

The double pulse output does not use any terminal numbers.

Slave term. no.

Navigation

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

Description

Displays the slave terminal number for the double pulse output.

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

* Visibility depends on order options or device settings

Additional information*User entry*

Weighting of the pulse output with a quantity.

The lower the pulse value, the

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

Pulse width**Navigation**

Expert → Output → Double pulse out → Pulse width (0986)

Description

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

User entry

0.5 to 2 000 ms

Factory setting

0.5 ms

Additional information

For a detailed description and example: **Pulse width** parameter (→ [122](#))

Phase shift**Navigation**

Expert → Output → Double pulse out → Phase shift (0992)

Description

Use this function to select the degree of phase shift.

Selection

- 90°
- 180°

Factory setting

90°

Additional information*Selection*

- 90°

Phase shift by a quarter period.

- 180°

Phase shift by a half period, which is equivalent to a phase reversal.

Measuring mode**Navigation**

Expert → Output → Double pulse out → Measuring mode (0984)

Description

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

Selection

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

Factory setting	Forward flow
Additional information	<i>Selection</i> <ul style="list-style-type: none">■ Forward flow Positive flow is output, negative flow is not output.■ Forward/Reverse Positive and negative flow are output (absolute value), but a distinction is not made between positive and negative flow.■ Reverse flow Negative flow is output, positive flow is not output.■ Rev. flow comp. The flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.
	i For a detailed description of the options available, see the Measuring mode parameter (→ 110)
	<i>Examples</i>
	i For a detailed description of the configuration examples, see the Measuring mode parameter (→ 110)

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	<ul style="list-style-type: none">■ Actual value■ No pulses
Factory setting	No pulses
Additional information	<i>Description</i> <p>The dictates of safety render it advisable to ensure that the double pulse output shows a predefined behavior in the event of a device alarm.</p> <i>Selection</i> <ul style="list-style-type: none">■ 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". <p>NOTICE! A device alarm is a measuring device error that must be taken seriously. It can affect the measurement quality such that the quality can no longer be guaranteed. The Actual value option is only recommended if it can be guaranteed that all possible alarm conditions will not affect the measurement quality.</p>

Pulse output

Navigation

 Expert → Output → Double pulse out → Pulse output (0987)

Description

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

User interface

Positive floating-point number

Additional information

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

Invert outp.sig.


Navigation

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

Description

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

Selection

- No
- Yes

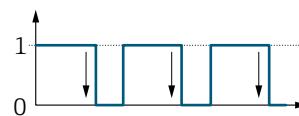
Factory setting

No

Additional information

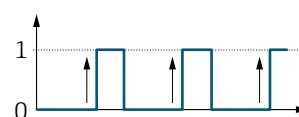
Selection

No option (passive - negative)



A0026693

Yes option (passive - positive)



A0026692

3.6 "Communication" submenu

Navigation

 Expert → Communication

► Communication

► Modbus config.

→  148

► Modbus info	→ 153
► Modbus data map	→ 154
► Web server	→ 154
► WLAN settings	→ 157

3.6.1 "Modbus config." submenu

Navigation



Expert → Communication → Modbus config.

► Modbus config.	
Bus address (7112)	→ 148
Baudrate (7111)	→ 149
Data trans. mode (7115)	→ 149
Parity (7122)	→ 149
Byte order (7113)	→ 150
Telegram delay (7146)	→ 151
Failure mode (7116)	→ 151
Bus termination (7155)	→ 152
Fieldb.writ.acc. (7156)	→ 152

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 trans. 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

Additional information*Description*

The byte sequence is not standardized by the Modbus protocol. However, if the host system and the measuring device do not use the same byte sequence, correct data exchange is not possible.

Changing the byte sequence in the host system often requires extensive knowledge and significant programming efforts. Endress+Hauser introduced the **Byte order** parameter (→ 150) for this reason.

This makes it possible to use the standard settings of the host system and change the byte sequence on the measuring device by trial and error. If correct data exchange cannot be achieved by changing the byte sequence, the settings for the byte sequence of the host system must be adapted accordingly.

Byte transmission sequence

Byte addressing, i.e. the transmission sequence of the bytes, is not specified in the Modbus specification. For this reason, it is important to coordinate or match the addressing method between the master and slave during commissioning. This can be configured in the measuring device using the **Byte order** parameter (→ 150).

The bytes are transmitted depending on the selection in the **Byte order** parameter (→ 150):

FLOAT				
	Sequence			
Options	1.	2.	3.	4.
1 - 0 - 3 - 2 *	Byte 1 (MMMMMM)	Byte 0 (MMMMMM)	Byte 3 (SEEEEEEE)	Byte 2 (EMMMMM)
0 - 1 - 2 - 3	Byte 0 (MMMMMM)	Byte 1 (MMMMMM)	Byte 2 (EMMMMM)	Byte 3 (SEEEEEEE)

2 - 3 - 0 - 1	Byte 2 (EMMMMMMM)	Byte 3 (SEEEEEEE)	Byte 0 (MMMMMMMM)	Byte 1 (MMMMMMMM)
3 - 2 - 1 - 0	Byte 3 (SEEEEEEE)	Byte 2 (EMMMMMMM)	Byte 1 (MMMMMMMM)	Byte 0 (MMMMMMMM)
* = factory setting, S = sign, E = exponent, M = mantissa				

INTEGER		
	Sequence	
Options	1.	2.
1 - 0 - 3 - 2 * 3 - 2 - 1 - 0	Byte 1 (MSB)	Byte 0 (LSB)
0 - 1 - 2 - 3 2 - 3 - 0 - 1	Byte 0 (LSB)	Byte 1 (MSB)
* = factory setting, MSB = most significant byte, LSB = least significant byte		

STRING					
	Sequence				
Options	1.	2.	...	17.	18.
1 - 0 - 3 - 2 * 3 - 2 - 1 - 0	Byte 17 (MSB)	Byte 16	...	Byte 1	Byte 0 (LSB)
0 - 1 - 2 - 3 2 - 3 - 0 - 1	Byte 16	Byte 17 (MSB)	...	Byte 0 (LSB)	Byte 1
* = factory setting, MSB = most significant byte, LSB = least significant byte					

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	<p><i>Options</i></p> <ul style="list-style-type: none">▪ NaN value The device outputs the NaN value⁶⁾.▪ Last valid value The device outputs the last valid measured value before the fault occurred. <p> This effect of this parameter depends on the option selected in the Assign diag. beh parameter.</p>

Bus termination

Navigation	 Expert → Communication → Modbus config. → Bus termination (7155)
Description	Displays whether the terminating resistor is enabled or disabled.
User interface	<ul style="list-style-type: none">▪ Off▪ On
Factory setting	Off
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none">▪ Off The terminating resistor is disabled.▪ On The terminating resistor is enabled. <p> For detailed information about enabling the terminating resistor, see the Operating Instructions for the device, "Enabling the terminating resistor" section</p>

Fieldb.writ.acc.

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	<ul style="list-style-type: none">▪ Read + write▪ Read only
Factory setting	Read + write

6) 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.



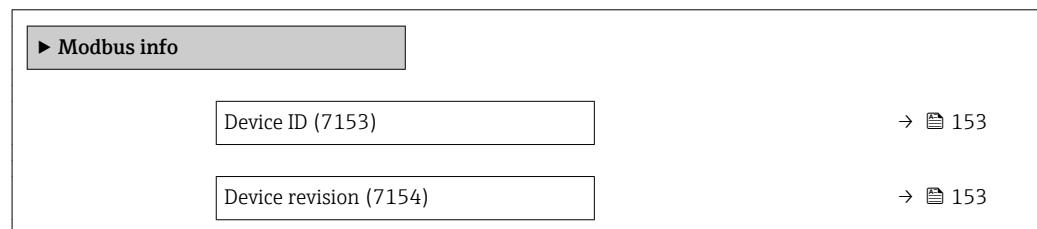
This does not affect cyclic measured value transmission to the higher-order system, which is always guaranteed.

Selection

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

3.6.2 "Modbus info" submenu**Navigation**

Expert → Communication → Modbus info

**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

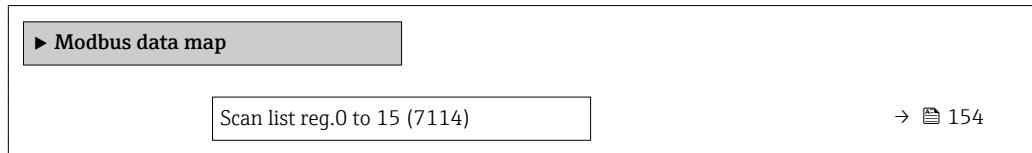
4-digit hexadecimal number

3.6.3 "Modbus data map" submenu

Navigation



Expert → Communication → Modbus data map



Scan list reg.0 to 15



Navigation

Navigation icon 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

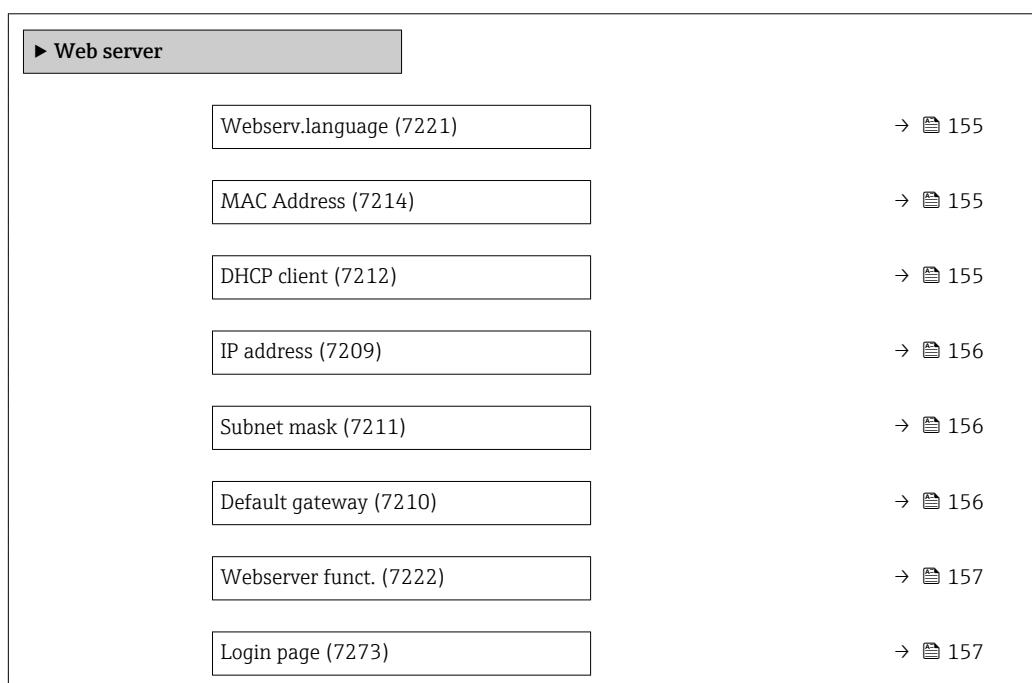
1

3.6.4 "Web server" submenu

Navigation



Expert → Communication → Web server



Webserv.language

Navigation	  Expert → Communication → Web server → Webserv.language (7221)
Description	Use this function to select the Web server language setting.
Selection	<ul style="list-style-type: none"> ■ English ■ Deutsch ■ Français ■ Español ■ Italiano ■ Nederlands ■ Portuguesa ■ Polski ■ русский язык(Ru) ■ Svenska ■ Türkçe ■ 中文 (Chinese) ■ 日本語 (Japanese) ■ 한국어 (Korean) ■ العربية(Ara) ■ Bahasa Indonesia ■ ภาษาไทย (Thai) ■ tiếng Việt (Viet) ■ čeština (Czech)
Factory setting	English

MAC Address

Navigation	  Expert → Communication → Web server → MAC Address (7214)
Description	Displays the MAC ⁷⁾ address of the measuring device.
User interface	Unique 12-digit character string comprising letters and numbers
Factory setting	Each measuring device is given an individual address.
Additional information	<p><i>Example</i></p> <p>For the display format 00:07:05:10:01:5F</p>

DHCP client

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

7) Media Access Control

Selection	<ul style="list-style-type: none">▪ Off▪ On
Factory setting	Off
Additional information	<p><i>Result</i></p> <p>If the DHCP client functionality of the Web server is activated, the IP address (→ 156), Subnet mask (→ 156) and Default gateway (→ 156) are set automatically.</p> <p>i ■ Identification is via the MAC address of the measuring device. ■ The IP address (→ 156) in the IP address parameter (→ 156) is ignored as long as the DHCP client parameter (→ 155) is active. This is also the case, in particular, if the DHCP server cannot be reached. The IP address (→ 156) in the parameter of the same name is only used if the DHCP client parameter (→ 155) is inactive.</p>

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

Subnet mask	
Navigation	 Expert → Communication → Web server → Subnet mask (7211)
Description	Display or enter the subnet mask.
User entry	4 octet: 0 to 255 (in the particular octet)
Factory setting	255.255.255.0

Default gateway	
Navigation	 Expert → Communication → Web server → Default gateway (7210)
Description	Display or enter the Default gateway (→ 156).
User entry	4 octet: 0 to 255 (in the particular octet)
Factory setting	0.0.0.0

Webserver funct.**Navigation**

Expert → Communication → Web server → Webserver funct. (7222)

Description

Use this function to switch the Web server on and off.

Selection

- Off
- HTML Off
- On

Factory setting

On

Additional information*Description*

Once disabled, the Webserver funct. can only be re-enabled via or the operating tool FieldCare.

Selection

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

Login page**Navigation**

Expert → Communication → Web server → Login page (7273)

Description

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

Selection

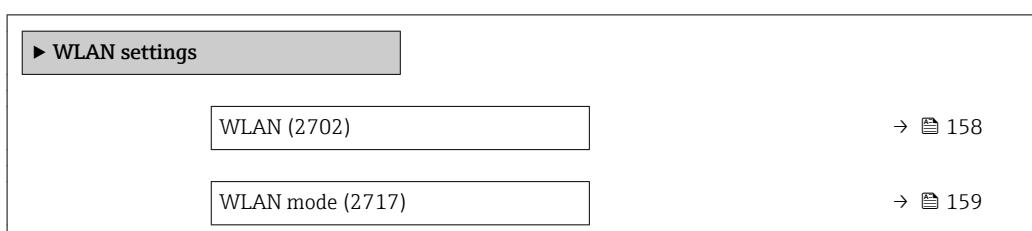
- Without header
- With header

Factory setting

With header

3.6.5 "WLAN settings" submenu*Navigation*

Expert → Communication → WLAN settings



SSID name (2714)	→ 159
Network security (2705)	→ 159
Sec. identific. (2718)	→ 160
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IP address DNS (2720)	→ 164

WLAN**Navigation**

Expert → Communication → WLAN settings → WLAN (2702)

Description

Use this function to enable and disable the WLAN connection.

Selection

- Disable
- Enable

Factory setting

Enable

WLAN mode



Navigation

Expert → Communication → WLAN settings → WLAN mode (2717)

Description

Use this function to select the WLAN mode.

Selection

- Access point
- WLAN Client

Factory setting

Access point

SSID name



Navigation

Expert → Communication → WLAN settings → SSID name (2714)

Prerequisite

The client is activated.

Description

Use this function to enter the user-defined SSID name (max. 32 characters) of the WLAN network.

User entry

–

Factory setting

–

Network security



Navigation

Expert → Communication → WLAN settings → Network security (2705)

Description

Use this function to select the type of security for the WLAN interface.

Selection

- Unsecured
- WPA2-PSK
- EAP-PEAP MSCHAP2 *
- EAP-PEAP NoAuth. *
- EAP-TLS *

Factory setting

WPA2-PSK

* Visibility depends on order options or device settings

Additional information*Selection*

- Unsecured
Access the WLAN connection without identification.
- WPA2-PSK
Access the WLAN connection with a network key.

Sec. identific.

Navigation  Expert → Communication → WLAN settings → Sec. identific. (2718)**Description**

Use this function to select the security settings (download via the menu: Data Management > Security > Download WLAN).

User interface

- Trust. iss.cert.
- Device certific.
- Dev. private key

User name

**Navigation**  Expert → Communication → WLAN settings → User name (2715)**Description**

Use this function to enter the username of the WLAN network.

User entry

–

Factory setting

–

WLAN password

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

Use this function to enter the WLAN password for the WLAN network.

User entry

–

Factory setting

–

WLAN IP address

**Navigation**  Expert → Communication → WLAN settings → WLAN IP address (2711)**Description**

Use this function to enter the IP address of the measuring device's WLAN connection.

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

Factory setting 192.168.1.212

WLAN MAC address

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

Description Displays the MAC⁸⁾ address of the measuring device.

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

Factory setting Each measuring device is given an individual address.

Additional information *Example*

For the display format

00:07:05:10:01:5F

WLAN subnet mask



Navigation  Expert → Communication → WLAN settings → WLAN subnet mask (2709)

Description Use this function to enter the subnet mask.

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

Factory setting 255.255.255.0

WLAN passphrase



Navigation  Expert → Communication → WLAN settings → WLAN passphrase (2706)

Prerequisite The **WPA2-PSK** option is selected in the **Security type** parameter (→  159).

Description Use this function to enter the network key.

User entry 8 to 32-digit character string comprising numbers, letters and special characters (without spaces)

Factory setting Serial number of the measuring device (e.g. L100A802000)

8) 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 SSID⁹⁾.

Selection

- Device tag
- User-defined

Factory setting User-defined

Additional information *Selection*

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

SSID name

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

Prerequisite

- The **User-defined** option is selected in the **Assign SSID name** parameter (→ 162).
- The **Access point** option is selected in the **WLAN mode** parameter (→ 159).

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_Prosonic_Flow_300_A802000)

WLAN channel

Navigation Expert → Communication → WLAN settings → WLAN channel (2704)

Description Use this function to enter the WLAN channel.

User entry 1 to 11

Factory setting 6

Additional information *Description*

- It is only necessary to enter a WLAN channel if multiple WLAN devices are in use.
■ If just one measuring device is in use, it is recommended to keep the factory setting.

9) Service Set Identifier

Select antenna**Navigation**

Expert → Communication → WLAN settings → Select antenna (2713)

Description

Use this function to select whether the external or internal antenna is used for reception.

Selection

- External antenna
- Internal antenna

Factory setting

Internal antenna

Connection state**Navigation**

Expert → Communication → WLAN settings → Connection state (2722)

Description

The connection status is displayed.

User interface

- Connected
- Not connected

Factory setting

Not connected

Rec.sig.strength**Navigation**

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

Description

Displays the signal strength received.

User interface

- Low
- Medium
- High

Factory setting

High

Gateway IP addr.**Navigation**

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

Description

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

Factory setting

192.168.1.212

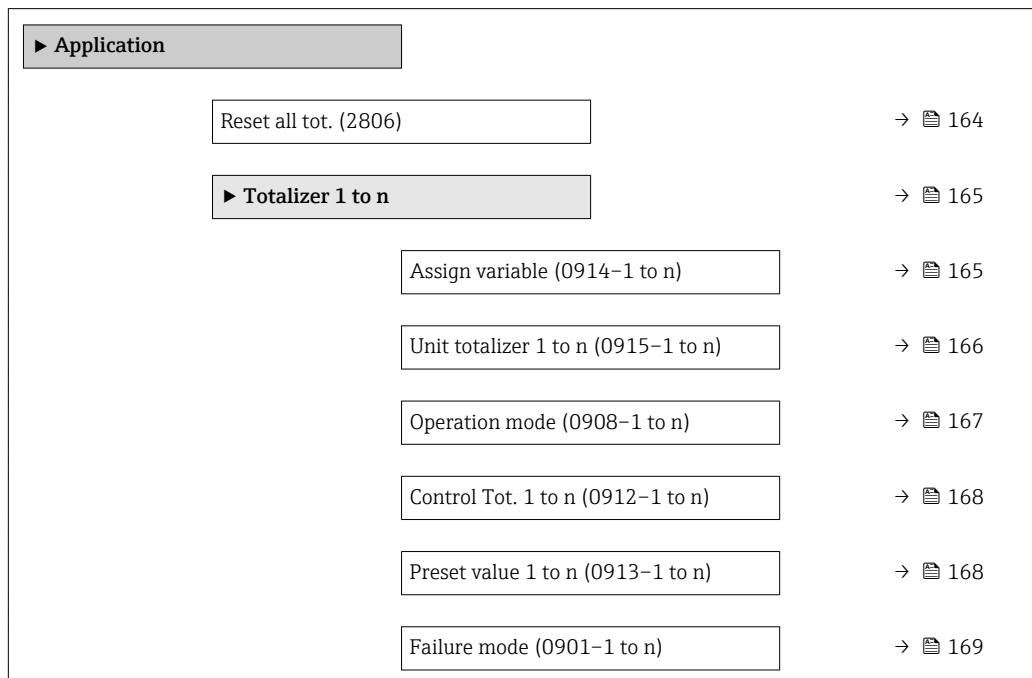
IP address DNS

Navigation	█ Expert → Communication → WLAN settings → IP address DNS (2720)
	█ Expert → Communication → WLAN settings → IP address DNS (2720)
Description	Use this function to enter the IP address of the domain name server.
Factory setting	192.168.1.212

3.7 "Application" submenu

Navigation

█ █ Expert → Application

**Reset all tot.**

Navigation	█ █ Expert → Application → Reset all tot. (2806)
Description	Use this function to reset all totalizers to the value 0 and restart the totaling process. This deletes all the flow values previously totalized.
Selection	<ul style="list-style-type: none"> ■ 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 totaled.

3.7.1 "Totalizer 1 to n" submenu*Navigation*

Expert → Application → Totalizer 1 to n

► Totalizer 1 to n	
Assign variable (0914-1 to n)	→ 165
Unit totalizer 1 to n (0915-1 to n)	→ 166
Operation mode (0908-1 to n)	→ 167
Control Tot. 1 to n (0912-1 to n)	→ 168
Preset value 1 to n (0913-1 to n)	→ 168
Failure mode (0901-1 to n)	→ 169

Assign variable*Navigation*

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

Description

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

Selection

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

Factory setting

Volume flow

* Visibility depends on order options or device settings

Additional information*Description*

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

Selection

If the **Off** option is selected, only **Assign variable** parameter (→ 165) is still displayed in the **Totalizer 1 to n** submenu. All other parameters in the submenu are hidden.

Unit totalizer 1 to n**Navigation**

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

Prerequisite

A process variable is selected in the **Assign variable** parameter (→ 165) of the **Totalizer 1 to n** submenu.

Description

Use this function to select the process variable unit for the Totalizer 1 to n (→ 165).

Selection*SI units*

- g *
- kg *
- t *

US units

- oz *
- lb *
- STon *

* Visibility depends on order options or device settings

or

SI units

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

US units

- af *
- ft³ *
- Mft³ *
- 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) *

* Visibility depends on order options or device settings

or

SI units

- NI *
- Nhl *
- Nm³ *
- Sl *
- Sm³ *

US units

- Sft³ *
- MMSft³ *
- Sgal (us) *
- Sbbl (us;liq.) *
- Sbbl (us;oil) *

Imperial units

- Sgal (imp) *

* Visibility depends on order options or device settings

or

SI units

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

Imperial units

- Btu *
- MBtu *
- MMBtu *

* Visibility depends on order options or device settings

or

Other units

- None *

* Visibility depends on order options or device settings

Factory setting

Country-specific:

- m³
- ft³

Additional information*Description*

 The unit is selected separately for each totalizer. It is independent of the selection made in the **System units** submenu (→ 62).

Selection

The selection is dependent on the process variable selected in the **Assign variable** parameter (→ 165).

Operation mode**Navigation**

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

Prerequisite

A process variable is selected in the **Assign variable** parameter (→ 165) of the **Totalizer 1 to n** submenu.

Description

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

Selection

- Net flow total
- Forward total
- Reverse total

Factory setting

Net flow total

Additional information*Selection*

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

Control Tot. 1 to n**Navigation**

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

Prerequisite

A process variable is selected in the **Assign variable** parameter (→ 165) of the **Totalizer 1 to n** submenu.

Description

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

Selection

- Totalize
- Reset + hold
- Preset + hold
- Reset + totalize
- Preset+totalize
- Hold

Factory setting

Totalize

Additional information*Selection*

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

Preset value 1 to n**Navigation**

 Expert → Application → Totalizer 1 to n → Preset value 1 to n (0913–1 to n)

Prerequisite

A process variable is selected in the **Assign variable** parameter (→ 165) of the **Totalizer 1 to n** submenu.

Description

Use this function to enter a start value for the Totalizer 1 to n.

User entry	Signed floating-point number
Factory setting	Country-specific: <ul style="list-style-type: none">■ 0 m³■ 0 ft³
Additional information	<p><i>User entry</i></p> <p> The unit of the selected process variable is specified for the totalizer in the Unit totalizer parameter (→ 166).</p> <p><i>Example</i></p> <p>This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.</p>

Failure mode

Navigation	  Expert → Application → Totalizer 1 to n → Failure mode (0901-1 to n)
Prerequisite	A process variable is selected in the Assign variable parameter (→ 165) of the Totalizer 1 to n submenu.
Description	Use this function to select how a totalizer behaves in the event of a device alarm.
Selection	<ul style="list-style-type: none">■ Stop■ Actual value■ Last valid value
Factory setting	Stop
Additional information	<p><i>Description</i></p> <p> This setting does not affect the failsafe mode of other totalizers and the outputs. This is specified in separate parameters.</p> <p><i>Selection</i></p> <p><ul style="list-style-type: none">■ 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.</p>

3.7.2 "Inventory count." submenu

Navigation

Expert → Application → Inventory count.

The screenshot shows a menu structure. At the top is a grey header bar with the text '► Inventory count.'. Below it is a white rectangular area containing a single item: 'Unit (0974)'. In the bottom right corner of this area, there is a small text element '→ 170'.

Unit

Navigation

Expert → Application → Inventory count. → Unit (0974)

Description

Displays the unit of the inventory counter.

User interface

SI units

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

US units

- ft³
- af
- 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)

Additional information

Description

The parameter cannot be configured or reset.

3.8 "Diagnostics" submenu

Navigation

Expert → Diagnostics

The screenshot shows a menu structure. At the top is a grey header bar with the text '► Diagnostics'. Below it is a white rectangular area containing five items, each in its own box: 'Actual diagnos.', 'Prev.diagnostics', 'Time fr. restart', 'Operating time', and '► Diagnostic list'. To the right of each item box is a small text element '→ 171', '→ 172', '→ 173', '→ 173', and '→ 173' respectively.

▶ Event logbook	→ 178
▶ Device info	→ 180
▶ Main elec.+I/O1	→ 183
▶ Sens. electronic	→ 184
▶ I/O module 2	→ 187
▶ I/O module 3	→ 188
▶ Display module	→ 189
▶ Data logging	→ 190
▶ Heartbeat	→ 198
▶ Simulation	→ 198

Actual diagnos.

Navigation

Expert → Diagnostics → Actual diagnos. (0691)

Prerequisite

A diagnostic event has occurred.

Description

Displays the current diagnostic message. If two or more messages occur simultaneously, the message with the highest priority is shown on the display.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

- Additional pending diagnostic messages can be viewed in the **Diagnostic list** submenu (→ 173).
- Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

Example

For the display format:

F271 Main electronics

Timestamp

Navigation

Expert → Diagnostics → Timestamp

Description

Displays the operating time when the current diagnostic message occurred.

User interface

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

Additional information

Display

 The diagnostic message can be viewed via the **Actual diagnos.** parameter
(→  171).

Example

For the display format:
24d12h13m00s

Prev.diagnostics

Navigation

 Expert → Diagnostics → Prev.diagnostics (0690)

Prerequisite

Two diagnostic events have already occurred.

Description

Displays the diagnostic message that occurred before the current message.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information

Display

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

Example

For the display format:
☒F271 Main electronics

Timestamp

Navigation

Expert → Diagnostics → Timestamp

Description

Displays the operating time when the last diagnostic message before the current message occurred.

User interface

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

Additional information*Display*

The diagnostic message can be viewed via the **Prev.diagnostics** parameter
 (→ [172](#)).

Example

For the display format:

24d12h13m00s

Time fr. restart**Navigation**

Expert → Diagnostics → Time fr. restart (0653)

Description

Use this function to display the time the device has been in operation since the last device restart.

User interface

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

Operating time**Navigation**

Expert → Diagnostics → Operating time (0652)

Description

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

User interface

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

Additional information*User interface*

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

3.8.1 "Diagnostic list" submenu*Navigation*

Expert → Diagnostics → Diagnostic list

► Diagnostic list	
Diagnostics 1 (0692)	→ 174
Diagnostics 2 (0693)	→ 174
Diagnostics 3 (0694)	→ 175
Diagnostics 4 (0695)	→ 176
Diagnostics 5 (0696)	→ 177

Diagnostics 1

Navigation	  Expert → Diagnostics → Diagnostic list → Diagnostics 1 (0692)
Description	Displays the current diagnostics message with the highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	<i>Display</i>  Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.
	<i>Examples</i> For the display format: <ul style="list-style-type: none">▪  F271 Main electronics▪  F276 I/O module

Timestamp

Navigation	  Expert → Diagnostics → Diagnostic list → Timestamp
Description	Displays the operating time when the diagnostic message with the highest priority occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<i>Display</i>  The diagnostic message can be viewed via the Diagnostics 1 parameter (→  174).
	<i>Example</i> For the display format: 24d12h13m00s

Diagnostics 2

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

Additional information*Display*

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

Examples

For the display format:

-  F271 Main electronics
-  F276 I/O module

Timestamp

Navigation

 Expert → Diagnostics → Diagnostic list → Timestamp

Description

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

User interface

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

Additional information*Display*

 The diagnostic message can be viewed via the **Diagnostics 2** parameter (→  174).

Example

For the display format:

24d12h13m00s

Diagnostics 3

Navigation

  Expert → Diagnostics → Diagnostic list → Diagnostics 3 (0694)

Description

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

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

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

Examples

For the display format:

-  F271 Main electronics
-  F276 I/O module

Timestamp

Navigation

 Expert → Diagnostics → Diagnostic list → Timestamp

Description

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

User interface

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

Additional information*Display*

 The diagnostic message can be viewed via the **Diagnostics 3** parameter (→  175).

Example

For the display format:
24d12h13m00s

Diagnostics 4

Navigation

  Expert → Diagnostics → Diagnostic list → Diagnostics 4 (0695)

Description

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

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

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

Examples

For the display format:
▪  F271 Main electronics
▪  F276 I/O module

Timestamp

Navigation

 Expert → Diagnostics → Diagnostic list → Timestamp

Description

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

User interface

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

Additional information*Display*

The diagnostic message can be viewed via the **Diagnostics 4** parameter (→ 176).

Example

For the display format:

24d12h13m00s

Diagnostics 5

Navigation

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

Description

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

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

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

Examples

For the display format:

- F271 Main electronics
- F276 I/O module

Timestamp

Navigation

Expert → Diagnostics → Diagnostic list → Timestamp

Description

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

User interface

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

Additional information*Display*

The diagnostic message can be viewed via the **Diagnostics 5** parameter (→ 177).

Example

For the display format:

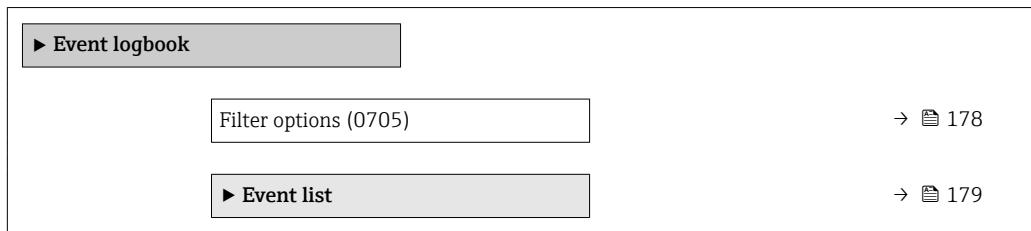
24d12h13m00s

3.8.2 "Event logbook" submenu

Navigation



Expert → Diagnostics → Event logbook



Filter options



Navigation

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

Description

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

Selection

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

Factory setting

All

Additional information

Description

The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:
■ F = Failure
■ C = Function Check
■ S = Out of Specification
■ M = Maintenance Required

Filter options



Navigation

Expert → Diagnostics → Event logbook → Filter options

Description

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

Selection

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

Factory setting All

Additional information *Description*

- i** The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:
- F = Failure
 - C = Function Check
 - S = Out of Specification
 - M = Maintenance Required

"Event list" submenu

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

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

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

Navigation  Expert → Diagnostics → Event logbook → Event list



Event list

Navigation  Expert → Diagnostics → Event logbook → Event list

Description Displays the history of event messages of the category selected in the **Filter options** parameter (→  178).

User interface

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

Additional information *Description*

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

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

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

- ⊖: Occurrence of the event
- ⊗: End of the event

Examples

For the display format:

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

HistoROM

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

3.8.3 "Device information" submenu

Navigation

Expert → Diagnostics → Device info

► Device info	
Device tag	→ 180
Serial number	→ 181
Firmware version	→ 181
Device name	→ 182
Order code	→ 182
Ext. order cd. 1	→ 182
Ext. order cd. 2	→ 183
Ext. order cd. 3	→ 183
ENP version	→ 183

Device tag

Navigation

Expert → Diagnostics → Device info → Device tag (0011)

Description

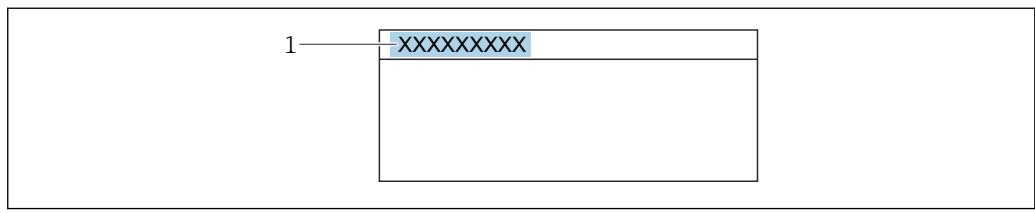
Displays a unique name for the measuring point so it can be identified quickly within the plant. The name is displayed in the header.

User interface

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

Factory setting Prosonic Flow

Additional information *User interface*



1 Position of the header text on the display

The number of characters displayed depends on the characters used.

Serial number

Navigation Expert → Diagnostics → Device info → Serial number (0009)

Description Displays the serial number of the measuring device.

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

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

Additional information *Description*

Uses of the serial number

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

Firmware version

Navigation Expert → Diagnostics → Device info → Firmware version (0010)

Description Displays the device firmware version installed.

User interface Character string in the format xx.yy.zz

Additional information *Display*

The Firmware version is also located:

- On the title page of the Operating instructions
- On the transmitter nameplate

Device name

Navigation   Expert → Diagnostics → Device info → Device name (0020)

Description Displays the name of the transmitter. It can also be found on the nameplate of the transmitter.

User interface Prosonic Flow 300

Order code

Navigation   Expert → Diagnostics → Device info → Order code (0008)

Description Displays the device order code.

User interface Character string composed of letters, numbers and certain punctuation marks (e.g. /).

Additional information *Description*

 The order code can be found on the nameplate of the sensor and transmitter in the "Order code" field.

The order code is generated from the extended order code through a process of reversible transformation. The extended order code indicates the attributes for all the device features in the product structure. The device features are not directly readable from the order code.

 **Uses of the order code**

- To order an identical spare device.
- To identify the device quickly and easily, e.g. when contacting Endress+Hauser.

Ext. order cd. 1

Navigation   Expert → Diagnostics → Device info → Ext. order cd. 1 (0023)

Description Displays the first part of the extended order code.

On account of length restrictions, the extended order code is split into a maximum of 3 parameters.

User interface Character string

Additional information *Description*

The extended order code indicates the version of all the features of the product structure for the measuring device and thus uniquely identifies the measuring device.

 The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.

Ext. order cd. 2

Navigation	Expert → Diagnostics → Device info → Ext. order cd. 2 (0021)
Description	Displays the second part of the extended order code.
User interface	Character string
Additional information	For additional information, see Ext. order cd. 1 parameter (→ 182)

Ext. order cd. 3

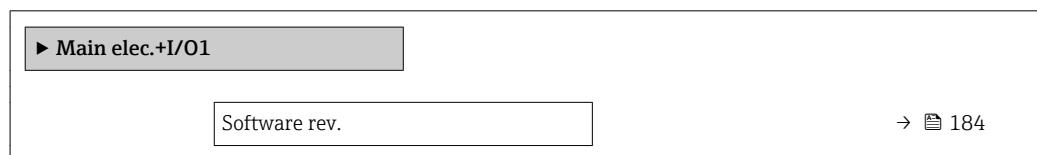
Navigation	Expert → Diagnostics → Device info → Ext. order cd. 3 (0022)
Description	Displays the third part of the extended order code.
User interface	Character string
Additional information	For additional information, see Ext. order cd. 1 parameter (→ 182)

ENP version

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

3.8.4 "Main elec.+I/O1" submenu

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



Build no. softw.	→ 184
Bootloader rev.	→ 184

Software rev.

Navigation Expert → Diagnostics → Main elec.+I/O1 → Software rev. (0072)

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

User interface Positive integer

Build no. softw.

Navigation Expert → Diagnostics → Main elec.+I/O1 → Build no. softw. (0079)

Description Use this function to display the software build number of the module.

User interface Positive integer

Bootloader rev.

Navigation Expert → Diagnostics → Main elec.+I/O1 → Bootloader rev. (0073)

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

User interface Positive integer

3.8.5 "Sens. electronic" submenu

Navigation Expert → Diagnostics → Sens. electronic

Sens. electronic	
Software rev. (0072)	→ 185
Build no. softw. (0079)	→ 185
Bootloader rev. (0073)	→ 185

Software rev.

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

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

User interface Positive integer

Build no. softw.

Navigation   Expert → Diagnostics → Sens. electronic → Build no. softw. (0079)

Description Use this function to display the software build number of the module.

User interface Positive integer

Bootloader rev.

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

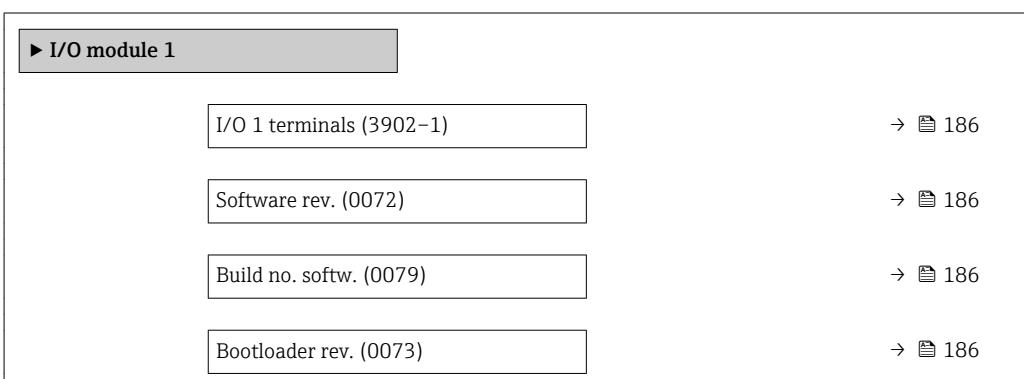
Description Use this function to display the bootloader revision of the software.

User interface Positive integer

3.8.6 "I/O module 1" submenu

Navigation

  Expert → Diagnostics → I/O module 1



I/O 1 terminals

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

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

User interface

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

Software rev.

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

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

User interface Positive integer

Build no. softw.

Navigation   Expert → Diagnostics → I/O module → Build no. softw. (0079)

Description Use this function to display the software build number of the module.

User interface Positive integer

Bootloader rev.

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

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

User interface Positive integer

3.8.7 "I/O module 2" submenu

Navigation

Expert → Diagnostics → I/O module 2

► I/O module 2	
I/O 2 terminals (3902-2)	→ 187
Software rev. (0072)	→ 187
Build no. softw. (0079)	→ 187
Bootloader rev. (0073)	→ 188

I/O 2 terminals

Navigation

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)

Software rev.

Navigation

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

Description

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

User interface

Positive integer

Build no. softw.

Navigation

Expert → Diagnostics → I/O module → Build no. softw. (0079)

Description

Use this function to display the software build number of the module.

User interface

Positive integer

Bootloader rev.

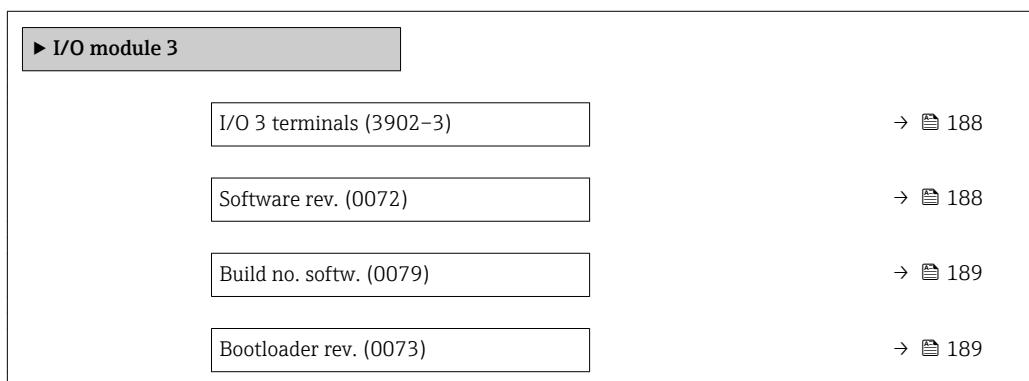
Navigation   Expert → Diagnostics → I/O module → Bootloader rev. (0073)

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

User interface Positive integer

3.8.8 "I/O module 3" submenu

Navigation   Expert → Diagnostics → I/O module 3



I/O 3 terminals

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)

Software rev.

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

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

User interface Positive integer

Build no. softw.

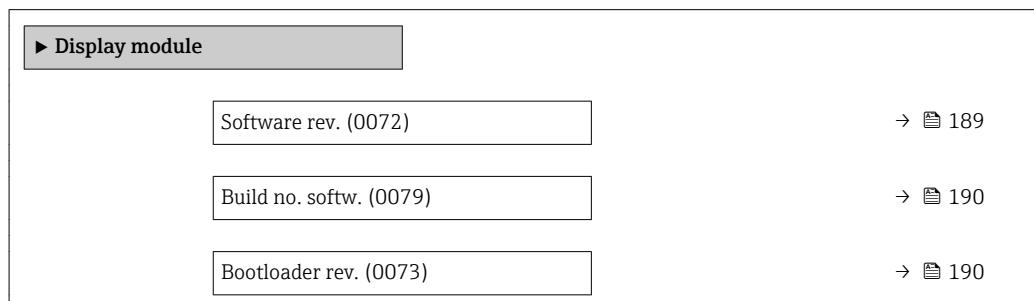
Navigation	  Expert → Diagnostics → I/O module → Build no. softw. (0079)
Description	Use this function to display the software build number of the module.
User interface	Positive integer

Bootloader rev.

Navigation	  Expert → Diagnostics → I/O module → Bootloader rev. (0073)
Description	Use this function to display the bootloader revision of the software.
User interface	Positive integer

3.8.9 "Display module" submenu

Navigation   Expert → Diagnostics → Display module



Software rev.

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

Build no. softw.

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

Description Use this function to display the software build number of the module.

User interface Positive integer

Bootloader rev.

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

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

User interface Positive integer

3.8.10 "Data logging" submenu

Navigation   Expert → Diagnostics → Data logging

 Data logging	
Assign chan. 1 (0851)	→  191
Assign chan. 2 (0852)	→  192
Assign chan. 3 (0853)	→  192
Assign chan. 4 (0854)	→  193
Logging interval (0856)	→  193
Clear logging (0855)	→  194
Data logging (0860)	→  194
Logging delay (0859)	→  194
Data log.control (0857)	→  195
Data log. status (0858)	→  195
Logging duration (0861)	→  196

► Displ.channel 1	→ 196
► Displ.channel 2	→ 197
► Displ.channel 3	→ 197
► Displ.channel 4	→ 198

Assign chan. 1

Navigation Expert → Diagnostics → Data logging → Assign chan. 1 (0851)

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

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

Description Use this function to select a process variable for the data logging channel.

Selection

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

Factory setting

Off

* Visibility depends on order options or device settings

Additional information**Description**

A total of 1000 measured values can be logged. This means:

- 1000 data points if 1 logging channel is used
- 500 data points if 2 logging channels are used
- 333 data points if 3 logging channels are used
- 250 data points if 4 logging channels are used

Once the maximum number of data points is reached, the oldest data points in the data log are cyclically overwritten in such a way that the last 1000, 500, 333 or 250 measured values are always in the log (ring memory principle).

 The log contents are cleared if the option selected is changed.

Assign chan. 2**Navigation**

 Expert → Diagnostics → Data logging → Assign chan. 2 (0852)

Prerequisite

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

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

Description

Options for the assignment of a process variable to the data logging channel.

Selection

Picklist, see **Assign channel 1** parameter (→  191)

Factory setting

Off

Assign chan. 3**Navigation**

 Expert → Diagnostics → Data logging → Assign chan. 3 (0853)

Prerequisite

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

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

Description

Options for the assignment of a process variable to the data logging channel.

Selection

Picklist, see **Assign channel 1** parameter (→  191)

Factory setting

Off

Assign chan. 4**Navigation**

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

Prerequisite

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

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

Description

Options for the assignment of a process variable to the data logging channel.

Selection

Picklist, see **Assign channel 1** parameter (→ 191)

Factory setting

Off

Logging interval**Navigation**

Expert → Diagnostics → Data logging → Logging interval (0856)

Prerequisite

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

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

Description

Use this function to enter the logging interval T_{log} for data logging.

User entry

0.1 to 3 600.0 s

Factory setting

1.0 s

Additional information*Description*

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

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

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

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

Example

If 1 logging channel is used:

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

Clear logging



Navigation

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

Prerequisite

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

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

Description

Use this function to clear the entire logging data.

Selection

- Cancel
- Clear data

Factory setting

Cancel

Additional information

Selection

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

Data logging



Navigation

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

Description

Use this function to select the data logging method.

Selection

- Overwriting
- Not overwriting

Factory setting

Overwriting

Additional information

Selection

- Overwriting
The device memory applies the FIFO principle.
- Not overwriting
Data logging is canceled if the measured value memory is full (single shot).

Logging delay



Navigation

Expert → Diagnostics → Data logging → Logging delay (0859)

Prerequisite

In the **Data logging** parameter (→ 194), the **Not overwriting** option is selected.

Description

Use this function to enter the time delay for measured value logging.

User entry

0 to 999 h

Factory setting 0 h

Additional information *Description*

Once measured value logging has been started with the **Data log.control** parameter (→ 195), the device does not save any data for the duration of the time delay entered.

Data log.control



Navigation Expert → Diagnostics → Data logging → Data log.control (0857)

Prerequisite In the **Data logging** parameter (→ 194), the **Not overwriting** option is selected.

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

Selection

- None
- Delete + start
- Stop

Factory setting None

Additional information *Selection*

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

Data log. status

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

Prerequisite In the **Data logging** parameter (→ 194), the **Not overwriting** option is selected.

Description Displays the measured value logging status.

User interface

- Done
- Delay active
- Active
- Stopped

Factory setting Done

Additional information*Selection*

- Done
Measured value logging has been performed and completed successfully.
- Delay active
Measured value logging has been started but the logging interval has not yet elapsed.
- Active
The logging interval has elapsed and measured value logging is active.
- Stopped
Measured value logging is stopped.

Logging duration**Navigation**
 Expert → Diagnostics → Data logging → Logging duration (0861)
Prerequisite

In the **Data logging** parameter (→ 194), the **Not overwriting** option is selected.

Description

Displays the total logging duration.

User interface

Positive floating-point number

Factory setting

0 s

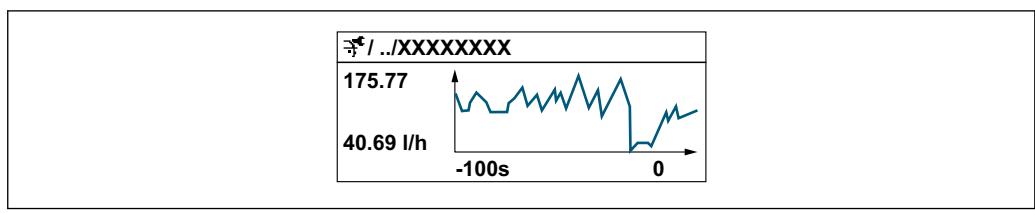
"Displ.channel 1" submenu*Navigation*
 Expert → Diagnostics → Data logging → Displ.channel 1
**Display channel 1****Navigation**
 Expert → Diagnostics → Data logging → Displ.channel 1
Prerequisite

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

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

Description

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

Additional information*Description*

10 Chart of a measured value trend

- x-axis: depending on the number of channels selected displays 250 to 1000 measured values of a process variable.
- y-axis: displays the approximate measured value span and constantly adapts this to the ongoing measurement.

"Displ.channel 2" submenu*Navigation*

Expert → Diagnostics → Data logging → Displ.channel 2

**Display channel 2****Navigation**

Expert → Diagnostics → Data logging → Displ.channel 2

Prerequisite

A process variable is defined in the **Assign chan. 2** parameter.

Description

See the **Display channel 1** parameter → 196

"Displ.channel 3" submenu*Navigation*

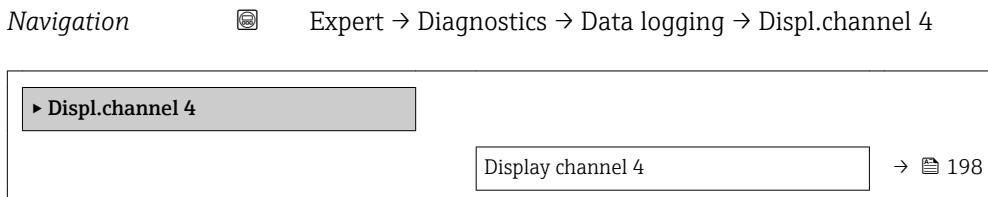
Expert → Diagnostics → Data logging → Displ.channel 3



Display channel 3

Navigation	Expert → Diagnostics → Data logging → Displ.channel 3
Prerequisite	A process variable is defined in the Assign chan. 3 parameter.
Description	See the Display channel 1 parameter → 196

"Displ.channel 4" submenu

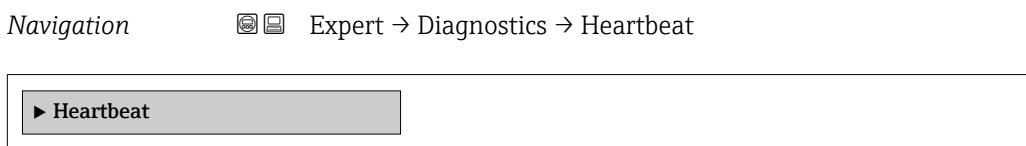


Display channel 4

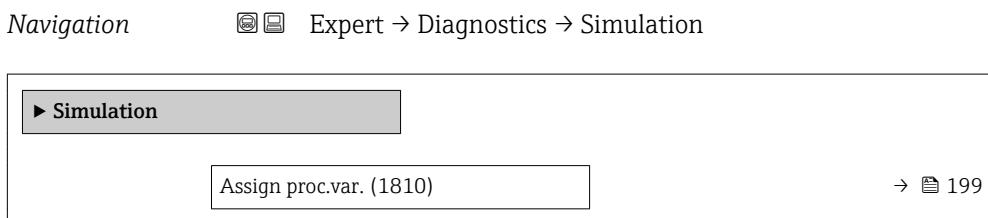
Navigation	Expert → Diagnostics → Data logging → Displ.channel 4
Prerequisite	A process variable is defined in the Assign chan. 4 parameter.
Description	See the Display channel 1 parameter → 196

3.8.11 "Heartbeat" submenu

For detailed information on the parameter descriptions for the **Heartbeat Verification+Monitoring** refer to the Special Documentation for the device → [7](#)



3.8.12 "Simulation" submenu



Proc. var. value (1811)	→ 200
Status inp.sim (1355)	→ 200
Signal level (1356)	→ 201
Curr.inp 1 to n sim. (1608-1 to n)	→ 201
Value curr.inp 1 to n (1609-1 to n)	→ 202
Curr.out. 1 to n sim. (0354-1 to n)	→ 202
Value curr.out 1 to n (0355-1 to n)	→ 203
FreqOutputSim 1 to n (0472-1 to n)	→ 203
Freq value 1 to n (0473-1 to n)	→ 203
Puls.outp.sim. 1 to n (0458-1 to n)	→ 204
Pulse value 1 to n (0459-1 to n)	→ 204
Switch sim. 1 to n (0462-1 to n)	→ 205
Switch status 1 to n (0463-1 to n)	→ 205
Relay out. 1 to n sim (0802-1 to n)	→ 206
Switch status 1 to n (0803-1 to n)	→ 206
Puls.outp.sim. (0988)	→ 207
Pulse value (0989)	→ 207
Dev. alarm sim. (0654)	→ 207
Event category (0738)	→ 208
Diag. event sim. (0737)	→ 208

Assign proc.var.**Navigation**

Expert → Diagnostics → Simulation → Assign proc.var. (1810)

Description

Use this function to select a process variable for the simulation process that is activated. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- Volume flow
- Correct.vol.flow *
- Mass flow
- Flow velocity
- Sound velocity *
- Temperature *
- Pressure *
- Methane fraction *
- Molar mass *
- Density *
- Dynam. viscosity *
- Calorific value *
- Wobbe index *
- Energy flow *

Factory setting

Off

Additional information*Description*

 The simulation value of the process variable selected is defined in the **Proc. var. value** parameter (→ [200](#)).

Proc. var. value**Navigation**

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

Prerequisite

A process variable is selected in the **Assign proc.var.** parameter (→ [199](#)).

Description

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

User entry

Depends on the process variable selected

Factory setting

0

Additional information*User entry*

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

Status inp.sim 1 to n**Navigation**

 Expert → Diagnostics → Simulation → Status inp.sim 1 to n (1355–1 to n)

Description

Use this function to switch simulation of the status input on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

* Visibility depends on order options or device settings

Selection	<ul style="list-style-type: none"> ▪ Off ▪ On
Factory setting	Off
Additional information	<p><i>Description</i></p>  The desired simulation value is defined in the Signal level parameter (→ 201).
	<p><i>Selection</i></p> <ul style="list-style-type: none"> ▪ Off Simulation for the status input is switched off. The device is in normal measuring mode or another process variable is being simulated. ▪ On Simulation for the status input is active.

Signal level 1 to n

Navigation	 Expert → Diagnostics → Simulation → Signal level 1 to n (1356–1 to n)
Prerequisite	In the Status inp.sim parameter (→ 200), the On option is selected.
Description	Use this function to select the signal level for the simulation of the status input. In this way, users can verify the correct configuration of the status input and the correct function of upstream feed-in units.
Selection	<ul style="list-style-type: none"> ▪ High ▪ Low

Curr.inp 1 to n sim.

Navigation	 Expert → Diagnostics → Simulation → Curr.inp 1 to n sim. (1608–1 to n)
Description	Option for switching simulation of the current input on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.
	 The desired simulation value is defined in the Value curr.inp 1 to n parameter.
Selection	<ul style="list-style-type: none"> ▪ Off ▪ On
Factory setting	Off

Additional information*Selection*

■ Off

Current simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.

■ On

Current simulation is active.

Value curr.inp 1 to n**Navigation**

Expert → Diagnostics → Simulation → Value curr.inp 1 to n (1609–1 to n)

Prerequisite

In the **Curr.inp 1 to n sim.** parameter, the **On** option is selected.

Description

Use this function to enter the current value for the simulation. In this way, users can verify the correct configuration of the current input and the correct function of upstream feed-in units.

User entry

0 to 22.5 mA

Curr.out. 1 to n sim.**Navigation**

Expert → Diagnostics → Simulation → Curr.out. 1 to n sim. (0354–1 to n)

Description

Use this function to switch simulation of the current output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

■ Off

■ On

Factory setting

Off

Additional information*Description*

The desired simulation value is defined in the **Value curr.out 1 to n** parameter.

Selection

■ Off

Current simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.

■ On

Current simulation is active.

Value curr.out 1 to n**Navigation**

Expert → Diagnostics → Simulation → Value curr.out 1 to n (0355–1 to n)

Prerequisite

In the **Curr.out. 1 to n sim.** parameter, the **On** option is selected.

Description

Use this function to enter a current value for the simulation. In this way, users can verify the correct adjustment of the current output and the correct function of downstream switching units.

User entry

3.59 to 22.5 mA

Additional information

Dependency

The input range is dependent on the option selected in the **Current span** parameter (→ [106](#)).

FreqOutputSim 1 to n**Navigation**

Expert → Diagnostics → Simulation → FreqOutputSim 1 to n (0472–1 to n)

Prerequisite

In the **Operating mode** parameter (→ [119](#)), the **Frequency** option is selected.

Description

Use this function to switch simulation of the frequency output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting

Off

Additional information

Description

The desired simulation value is defined in the **Freq value 1 to n** parameter.

Selection

- Off

Frequency simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On

Frequency simulation is active.

Freq value 1 to n**Navigation**

Expert → Diagnostics → Simulation → Freq value 1 to n (0473–1 to n)

Prerequisite

In the **FreqOutputSim 1 to n** parameter, the **On** option is selected.

Description Use this function to enter a frequency value for the simulation. In this way, users can verify the correct adjustment of the frequency output and the correct function of downstream switching units.

User entry 0.0 to 12 500.0 Hz

Puls.outp.sim. 1 to n



Navigation Expert → Diagnostics → Simulation → Puls.outp.sim. 1 to n (0458–1 to n)

Prerequisite In the **Operating mode** parameter (→ 119), the **Pulse** option is selected.

Description Use this function to switch simulation of the pulse output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- Fixed value
- Down-count. val.

Factory setting Off

Additional information *Description*

The desired simulation value is defined in the **Pulse value 1 to n** parameter.

Selection

- Off
Pulse simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- Fixed value
Pulses are continuously output with the pulse width specified in the **Pulse width** parameter (→ 122).
- Down-count. val.
The pulses specified in the **Pulse value** parameter (→ 204) are output.

Pulse value 1 to n



Navigation Expert → Diagnostics → Simulation → Pulse value 1 to n (0459–1 to n)

Prerequisite In the **Puls.outp.sim. 1 to n** parameter, the **Down-count. val.** option is selected.

Description Use this function to enter a pulse value for the simulation. In this way, users can verify the correct adjustment of the pulse output and the correct function of downstream switching units.

User entry 0 to 65 535

Switch sim. 1 to n

Navigation Expert → Diagnostics → Simulation → Switch sim. 1 to n (0462-1 to n)

Prerequisite In the **Operating mode** parameter (→ 119), the **Switch** option is selected.

Description Use this function to switch simulation of the switch output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting Off

Additional information *Description*

The desired simulation value is defined in the **Switch status 1 to n** parameter.

Selection

- Off
Switch simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
Switch simulation is active.

Switch status 1 to n

Navigation Expert → Diagnostics → Simulation → Switch status 1 to n (0463-1 to n)

Description Use this function to select a switch value for the simulation. In this way, users can verify the correct adjustment of the switch output and the correct function of downstream switching units.

Selection

- Open
- Closed

Additional information *Selection*

- Open
Switch simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- Closed
Switch simulation is active.

Relay out. 1 to n sim**Navigation**

Expert → Diagnostics → Simulation → Relay out. 1 to n sim (0802–1 to n)

Description

Use this function to switch simulation of the relay output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting

Off

Additional information**Description** The desired simulation value is defined in the **Switch status 1 to n** parameter.**Selection**

- Off
Relay simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
Relay simulation is active.

Switch status 1 to n**Navigation**

Expert → Diagnostics → Simulation → Switch status 1 to n (0803–1 to n)

Prerequisite

The **On** option is selected in the **Switch sim. 1 to n** parameter parameter.

Description

Use this function to select a relay value for the simulation. In this way, users can verify the correct adjustment of the relay output and the correct function of downstream switching units.

Selection

- Open
- Closed

Additional information**Selection**

- Open
Relay simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- Closed
Relay simulation is active.

Puls.outp.sim.**Navigation**

Expert → Diagnostics → Simulation → Puls.outp.sim. (0988)

Description

Use this function to switch simulation of the double pulse output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- Fixed value
- Down-count. val.

Factory setting

Off

Additional information*Description*

The desired simulation value is defined in the **Pulse value** parameter (→ [207](#)).

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 (→ [145](#)).
- Down-count. val.
The pulses specified in the **Pulse value** parameter (→ [207](#)) are output.

Pulse value**Navigation**

Expert → Diagnostics → Simulation → Pulse value (0989)

Prerequisite

In the **Puls.outp.sim.** parameter (→ [207](#)), the **Down-count. val.** option is selected.

Description

Use this function to enter a pulse value for simulation of the double pulse output. In this way, users can verify the correct adjustment of the double pulse output and the correct function of downstream switching units.

User entry

0 to 65 535

Dev. alarm sim.**Navigation**

Expert → Diagnostics → Simulation → Dev. alarm sim. (0654)

Description

Use this function to switch the device alarm on and off.

Selection

- Off
- On

Factory setting Off

Additional information *Description*

The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Event category



Navigation Expert → Diagnostics → Simulation → Event category (0738)

Description Use this function to select the category of the diagnostic events that are displayed for the simulation in the **Diag. event sim.** parameter (→ 208).

Selection

- Sensor
- Electronics
- Configuration
- Process

Factory setting Process

Diag. event sim.



Navigation Expert → Diagnostics → Simulation → Diag. event sim. (0737)

Description Use this function to select a diagnostic event for the simulation process that is activated.

Selection

- Off
- Diagnostic event picklist (depends on the category selected)

Factory setting Off

Additional information *Description*

For the simulation, you can choose from the diagnostic events of the category selected in the **Event category** parameter (→ 208).

4 Country-specific factory settings

4.1 SI units

 Not valid for USA and Canada.

4.1.1 System units

Mass	kg
Mass flow	kg/h
Volume	m ³
Volume flow	m ³ /h
Corrected volume	Nm ³
Corrected volume flow	Nm ³ /h
Density	kg/l
Reference density	kg/Nl
Energy	kWh
Energy flow	kW
Calorific value	kWh/Nm ³
Velocity	m/s
Dynamic viscosity	Pa s
Spec. heat capacity	kJ/(kgK)
Temperature	°C
Pressure	mbar a

4.1.2 Full scale values

 The factory settings apply to the following parameters:

- 20 mA value (full scale value of the current output)
- 100% bar graph value 1

Nominal diameter [mm]	[m ³ /h]
25	50
50	210
80	460
100	800
150	1 800
200	3 200
250	5 000
300	7 100

4.1.3 Output current span

Current output 1 to n	4 to 20 mA NAMUR
-----------------------	------------------

4.1.4 Pulse value

Nominal diameter [mm]	[m ³ /pulse]
25	0.007
50	0.03
80	0.06
100	0.1
150	0.3
200	0.4
250	0.7
300	1.0

4.1.5 On value low flow cut off

 The switch-on point depends on the type of medium and the nominal diameter.

Nominal diameter [mm]	Switch-on point [m ³ /h]
25	0.17
50	0.68
80	1.5
100	2.7
150	6.0
200	11
250	17
300	24

4.2 US units

 Only valid for USA and Canada.

4.2.1 System units

Mass	lb
Mass flow	lb/min
Volume	ft ³
Volume flow	ft ³ /min
Corrected volume	Sft ³
Corrected volume flow	Sft ³ /h
Density	lb/ft ³
Reference density	lb/Sft ³
Energy	Btu
Energy flow	Btu/h
Calorific value	Btu/Sft ³
Velocity	ft/s

Temperature	°F
Pressure	psi a

4.2.2 Full scale values

i The factory settings apply to the following parameters:

- 20 mA value (full scale value of the current output)
- 100% bar graph value 1

Nominal diameter [in]	[ft ³ /hr]
1	1800
2	7300
3	16000
4	28000
6	64000
8	110000
10	180000
12	250000

4.2.3 Output current span

Current output 1 to n	4 to 20 mA US
-----------------------	---------------

4.2.4 Pulse value

Nominal diameter [in]	[ft ³ /pulse]
1	0.2
2	1
3	2
4	4
6	9
8	16
10	25
12	35

4.2.5 On value low flow cut off

i The switch-on point depends on the type of medium and the nominal diameter.

Nominal diameter [in]	Switch-on point [ft ³ /hr]
1	5.9
2	24
3	54
4	94

Nominal diameter [in]	Switch-on point [ft ³ /hr]
6	213
8	374
10	588
12	832

5 Explanation of abbreviated units

5.1 SI units

Process variable	Units	Explanation
Mass	g, kg, t	Gram, kilogram, metric ton
Mass flow	g/s, g/min	Gram/time unit
	kg/s, kg/min, kg/h, kg/d	Kilogram/time unit
	t/h, t/d	Metric ton/time unit
Volume	cm ³ , dm ³ , m ³	Cubic centimeter, cubic decimeter, cubic meter
	ml, l	Milliliter, liter
Volume flow	dm ³ /s, dm ³ /min, dm ³ /h, dm ³ /d	Cubic decimeter/time unit
	m ³ /s, m ³ /min, m ³ /h, m ³ /d	Cubic meter/time unit
	l/s, l/min, l/h, l/d	Liter/time unit
Corrected volume	Nl, Nm ³ , Sm ³	Normal liter, normal cubic meter, standard cubic meter
Corrected volume flow	Nl/s, Nl/min, Nl/h, Nl/d	Normal liter/time unit
	Nm ³ /s, Nm ³ /min, Nm ³ /h, Nm ³ /d	Normal cubic meter/time unit
	Sm ³ /s, Sm ³ /min, Sm ³ /h, Sm ³ /d	Standard cubic meter/time unit
Density	kg/l	Kilogram/liter
Reference density	kg/Nl	Kilogram/standard liter
Energy	kWh, MWh, GWh	Kilowatt hour, megawatt hour, gigawatt hour
	kJ, MJ, GJ	Kilojoule, megajoule, gigajoule
	kcal, Mcal	Kilocalories, megacalories
Energy flow	kW, MW	Kilowatt, megawatt
	kJ/s, kJ/min, kJ/h, kJ/d	Kilojoule/time unit
	MJ/h, MJ/d	Megajoule/time unit
	kcal/s, kcal/min, kcal/h, kcal/d	Kilocalories/time unit
	Mcal/h, Mcal/d	Megacalories/time unit
Calorific value	kWh/Nm ³ , kJ/Nm ³	Kilowatt hour/standard cubic meter, kilojoule/standard cubic meter
	kWh/Sm ³ , kJ/Sm ³	Kilowatt hour/standard cubic meter, kilojoule/standard cubic meter
Velocity	m/s	Meter/time unit
Dynamic viscosity	Pa s	Pascal second
Specific heat capacity	kJ/(kgK)	Kilojoule/(kilogram Kelvin)
Temperature	°C, K	Celsius, Kelvin
Pressure	Pa, kPa, MPa	Pascal, kilopascal, megapascal
	mbar, bar	Millibar, bar
Time	m, h, d, y	Minute, hour, day, year

5.2 US units

Process variable	Units	Explanation
Mass	oz, lb, STon	Ounce, pound, standard ton
Mass flow	oz/s, oz/min	Ounce/time unit
	lb/s, lb/min, lb/h, lb/d	Pound/time unit
	STon/h, STon/d	Standard ton/time unit
Volume	ft ³	Cubic foot
Volume flow	ft ³ /s, ft ³ /min, ft ³ /h, ft ³ /d	Cubic foot/time unit
Corrected volume	Sft ³	Standard cubic foot
Corrected volume flow	Sft ³ /s, Sft ³ /min, Sft ³ /h, Sft ³ /d	Standard cubic foot/time unit
Density	lb/ft ³	Pound/cubic foot
Reference density	lb/Sft ³	Pound/standard cubic foot
Energy	kWh, MWh, GWh	Kilowatt hour, megawatt hour, gigawatt hour
	kJ, MJ, GJ	Kilojoule, megajoule, gigajoule
	kcal, Mcal	Kilocalories, megacalories
Energy flow	kW, MW	Kilowatt, megawatt
	kJ/s, kJ/min, kJ/h, kJ/d	Kilojoule/time unit
	MJ/h, MJ/d	Megajoule/time unit
	kcal/s, kcal/min, kcal/h, kcal/d	Kilocalories/time unit
	Mcal/h, Mcal/d	Megacalories/time unit
Calorific value	kWh/Sft ³ , kJ/Sft ³	Kilowatt hour/standard cubic foot, kilojoule/standard cubic foot
Velocity	ft/s	Foot/time unit
Temperature	°F, °R	Fahrenheit, Rankine
Pressure	psi a	Psi absolute
Time	m, h, d, y	Minute, hour, day, year
	am, pm	Ante meridiem (before midday), post meridiem (after midday)

5.3 Imperial units

Process variable	Units	Explanation
Volume	bbl (imp;beer)	Barrel (beer)
Volume flow	bbl/s (imp;beer), bbl/min (imp;beer), bbl/h (imp;beer), bbl/d (imp;beer)	Barrel /time unit (beer) Beer: 36.0 gal/bbl
Energy	Btu, MBtu, MMBtu	British thermal unit, thousand British thermal units, million British thermal units
Energy flow	Btu/s, Btu/min, Btu/h, Btu/day	British thermal unit/time unit
	MBtu/min, MBtu/h, MBtu/d	Thousand British thermal units/time unit
	MMBtu/h, MMBtu/d	Million British thermal units/time unit
Calorific value	Btu/Sm ³ , MBtu/Sm ³	British thermal unit/standard cubic meter, thousand British thermal units/standard cubic meter

Process variable	Units	Explanation
	Btu/Sft ³ , MBtu/Sft ³	British thermal unit/standard cubic foot, thousand British thermal units/standard cubic foot
Time	m, h, d, y	Minute, hour, day, year
	am, pm	Ante meridiem (before midday), post meridiem (after midday)

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	<ul style="list-style-type: none"> ▪ Float length = 4 byte ▪ Integer length = 2 byte ▪ String length, depending on parameter 	Possible type of access to parameter: <ul style="list-style-type: none"> ▪ Read access via function codes 03, 04 or 23 ▪ Write access via function codes 06, 16 or 23 	Options List of the individual options for the parameter <ul style="list-style-type: none"> ▪ Option 1 ▪ Option 2 ▪ Option 3 ⁽⁺⁾  <ul style="list-style-type: none"> ▪ Factory setting highlighted in bold ▪ ⁽⁺⁾ = Factory setting depends on country, order options or device settings User entry Input range for the parameter	Page number information and cross-reference to the 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	→ 219
Locking status	→ 219
Access status	→ 219
Ent. access code	→ 219
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▶ Sensor adjustm.	→ 235
▶ Calibration	→ 236

► I/O config.	→ 236
I/O 1 to n terminals	→ 236
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I/O 1 to n type	→ 236
Apply I/O config	→ 236
Alteration code	→ 236
► Input	→ 236
► Current input 1 to n	→ 236
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► Output	→ 237
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► PFS output 1 to n	→ 239
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► Modbus info	→ 244
► Modbus data map	→ 244
► WLAN settings	→ 244
► Application	→ 245
Reset all tot.	→ 245
► Totalizer 1 to n	→ 246
► Diagnostics	→ 247
Actual diagnos.	→ 247
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► Diagnostic list	→ 247
► Event logbook	→ 248
► Device info	→ 248
► Main elec.+I/O1	→ 248
► Sens. electronic	→ 248
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► I/O module 3	→ 249
► Display module	→ 249
► Data logging	→ 250
► Simulation	→ 251

6.3 Register information

Navigation: Expert					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Direct access	3878	Integer	Read / Write	0 to 65 535	11
Locking status	4918	Integer	Read	256 = Hardware locked 512 = Temp. locked 2048 = CT act.-def.par. 32768 = CT act.-all par.	12
Access status	2178	Integer	Read	0 = Operator 1 = Maintenance	13
Ent. access code	2177	Integer	Read / Write	Max. 16-digit character string comprising numbers, letters and special characters	13

6.3.1 "System" submenu

"Display" submenu

Navigation: Expert → System → Display					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Display language	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 (Ru) 15 = čeština (Czech) 16 = 中文 (Chinese) 17 = ภาษาไทย (Thai) 18 = Türkçe 19 = tiếng Việt (Vit) 20 = 한국어 (Korean) 21 = العربية (Ara)	15
Format display	3625	Integer	Read / Write	0 = 1 value, max. 1 = Bargr. + 1 value 2 = 2 values 3 = Val. large+2val. 4 = 4 values	15
Value 1 display	3963	Integer	Read / Write	1 = Mass flow 2 = Volume flow 3 = Flow velocity 4 = Sound velocity 5 = Totalizer 1 6 = Totalizer 2 7 = Totalizer 3 8 = Temperature * 9 = Methane fraction * 10 = Molar mass * 11 = Flow asymmetry * 12 = Dynam. viscosity * 13 = Correct.vol.flow * 14 = Density * 15 = Signal strength * 16 = SNR * 17 = Turbulence * 20 = Acceptance rate * 21 = Wobbe index * 22 = Pressure * 23 = Calorific value * 24 = Test point 1 * 25 = Test point 2 * 38 = Energy flow * 39 = Electronic temp. * 121 = Curr.output 1 * 122 = Curr.output 2 * 123 = Curr.output 3 * 124 = Curr.output 4 *	18
0% bargraph 1	4136 to 4137	Float	Read / Write	Signed floating-point number	19
100% bargraph 1	4142 to 4143	Float	Read / Write	Signed floating-point number	19

Navigation: Expert → System → Display					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
Decimal places 1	3365	Integer	Read / Write	0 = x 1 = x.x 2 = x.xx 3 = x.xxx 4 = xxxxx	19
Value 2 display	3964	Integer	Read / Write	1 = Mass flow 2 = Volume flow 3 = Flow velocity 4 = Sound velocity 5 = Totalizer 1 6 = Totalizer 2 7 = Totalizer 3 8 = Temperature * 9 = Methane fraction * 10 = Molar mass * 11 = Flow asymmetry * 12 = Dynam. viscosity * 13 = Correct.vol.flow * 14 = Density * 15 = Signal strength * 16 = SNR * 17 = Turbulence * 20 = Acceptance rate * 21 = Wobbe index * 22 = Pressure * 23 = Calorific value * 24 = Test point 1 * 25 = Test point 2 * 38 = Energy flow * 39 = Electronic temp. 121 = Curr.output 1 * 122 = Curr.output 2 * 123 = Curr.output 3 * 124 = Curr.output 4 * 251 = None	20
Decimal places 2	4049	Integer	Read / Write	0 = x 1 = x.x 2 = x.xx 3 = x.xxx 4 = xxxxx	21
Value 3 display	3966	Integer	Read / Write	For the picklist, see the Value 2 display parameter (→  20)	21
0% bargraph 3	4138 to 4139	Float	Read / Write	Signed floating-point number	22
100% bargraph 3	4140 to 4141	Float	Read / Write	Signed floating-point number	22
Decimal places 3	4050	Integer	Read / Write	0 = x 1 = x.x 2 = x.xx 3 = x.xxx 4 = xxxxx	23
Value 4 display	3965	Integer	Read / Write	For the picklist, see the Value 2 display parameter (→  20)	23
Decimal places 4	4051	Integer	Read / Write	0 = x 1 = x.x 2 = x.xx 3 = x.xxx 4 = xxxxx	24
Display interval	3604 to 3605	Float	Read / Write	1 to 10 s	24
Display damping	3554 to 3555	Float	Read / Write	0.0 to 999.9 s	25
Header	3624	Integer	Read / Write	0 = Device tag 1 = Free text	25

Navigation: Expert → System → Display					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Header text	3968 to 3973	String	Read / Write	Max. 12 characters such as letters, numbers or special characters (e.g. @, %, /)	26
Separator	3671	Integer	Read / Write	■ . (point) ■ , (comma)	26
Contrast display	3674 to 3675	Float	Read / Write	20 to 80 %	27
Backlight	3967	Integer	Read / Write	0 = Disable 1 = Enable	27

* Visibility depends on order options or device settings

"Config. backup" submenu

Navigation: Expert → System → Config. backup					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Operating time	2631	Integer	Read	Days (d), hours (h), minutes (m) and seconds (s)	28
Last backup	6430	Integer	Read	Days (d), hours (h), minutes (m) and seconds (s)	28
Config. managem.	5500	Integer	Read / Write	0 = Cancel 1 = Execute backup 2 = Restore * 4 = Clear backup 5 = Compare	28
Backup state	5502	Integer	Read	1 = Backup in progr. 2 = Restore in progr. 4 = Delete in progr. 5 = Comp. in progr. 6 = Restoring failed 7 = Backup failed 251 = None	29
Compar. result	5514	Integer	Read	0 = Set. identical 1 = Set. not ident. 2 = No backup 3 = Check not done 4 = Backup corrupt 5 = Dataset incompl.	29

* Visibility depends on order options or device settings

"Diagn. handling" submenu

Navigation: Expert → System → Diagn. handling					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Alarm delay	6808 to 6809	Float	Read / Write	0 to 60 s	31

"Diagn. behavior" submenu

Navigation: Expert → System → Diagn. handling → Diagn. behavior					→ 
Parameter	Register	Data type	Access	Selection / User entry / User interface	
Diagnostic no. 302	6484	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	34
Diagnostic no. 125	24746	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	33
Diagnostic no. 124	24744	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	33
Diagnostic no. 160	2873	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	33
Diagnostic no. 954	21572	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	41
Diagnostic no. 953	21552	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	40
Diagnostic no. 441	4742	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	34
Diagnostic no. 442	4919	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	34
Diagnostic no. 443	5000	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	35
Diagnostic no. 840	2434	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	38
Diagnostic no. 444	5120	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	35
Diagnostic no. 452	29513	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	35
Diagnostic no. 543	2362	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	36
Diagnostic no. 881	2487	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	39

Navigation: Expert → System → Diagn. handling → Diagn. behavior					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Diagnostic no. 832	6440	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	36
Diagnostic no. 833	6439	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	37
Diagnostic no. 834	6438	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	37
Diagnostic no. 835	6437	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	37
Diagnostic no. 842	9661	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	38
Diagnostic no. 930	30668	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	40
Diagnostic no. 931	30930	Integer	Read / Write	0 = Off 1 = Logbook only 2 = Warning 3 = Alarm	40

"Administration" submenu

Navigation: Expert → System → Administration					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Device reset	6817	Integer	Read / Write	0 = Cancel 1 = Restart device 2 = To delivery set. 5 = Del. p.fail data 21 = Delete T-DAT 22 = Res.fault.param. 23 = Del. deliv.sett. 24 = Delete HistoROM	44
Activate SW opt.	2795	Integer	Read / Write	Max. 10-digit string consisting of numbers.	44
SW option overv.	2902	Integer	Read	1 = Extend. HistoROM 16 = Ad. gas analysis 16384 = HBT Monitoring 32768 = HBT Verification	45

"Def. access code" wizard

Navigation: Expert → System → Administration → Def. access code				
Parameter	Register	Data type	Access	Selection / User entry / User interface
Def. access code	8677 to 8684	String	Read / Write	Max. 16-digit character string comprising numbers, letters and special characters
Confirm code	8685 to 8692	String	Read / Write	Max. 16-digit character string comprising numbers, letters and special characters

"Reset acc. code" submenu

Navigation: Expert → System → Administration → Reset acc. code				
Parameter	Register	Data type	Access	Selection / User entry / User interface
Operating time	2631	Integer	Read	Days (d), hours (h), minutes (m) and seconds (s)
Reset acc. code	8880 to 8895	String	Read / Write	Character string comprising numbers, letters and special characters

6.3.2 "Sensor" submenu**"Measured val." submenu***"Process variab." submenu*

Navigation: Expert → Sensor → Measured val. → Process variab.				
Parameter	Register	Data type	Access	Selection / User entry / User interface
Volume flow	2007 to 2008	Float	Read	Signed floating-point number
Mass flow	2009 to 2010	Float	Read	Signed floating-point number
Sound velocity	2013 to 2014	Float	Read	Signed floating-point number
Pressure	2093 to 2094	Float	Read	Signed floating-point number
Energy flow	2011 to 2012	Float	Read	Signed floating-point number
Flow velocity	2015 to 2016	Float	Read	Signed floating-point number
Temperature	2017 to 2018	Float	Read	Signed floating-point number
Wobbe index	2019 to 2020	Float	Read	Signed floating-point number
Correct.vol.flow	2083 to 2084	Float	Read	Signed floating-point number
Dry CH4 in %	2095 to 2096	Float	Read	Signed floating-point number
Molar mass	2797 to 2798	Float	Read	Signed floating-point number
Density	2799 to 2800	Float	Read	Signed floating-point number
Dynam. viscosity	2598 to 2599	Float	Read	Signed floating-point number
Calorific value	25790 to 25791	Float	Read	Signed floating-point number

"System values" submenu

Navigation: Expert → Sensor → Measured val. → System values				
Parameter	Register	Data type	Access	Selection / User entry / User interface
Signal strength	4959 to 4960	Float	Read	Signed floating-point number
Asymmetry	4555 to 4556	Float	Read	Signed floating-point number

Navigation: Expert → Sensor → Measured val. → System values					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
SNR	4983 to 4984	Float	Read	Signed floating-point number	53
Turbulence	22772 to 22773	Float	Read	Signed floating-point number	53

"Totalizer" submenu

Navigation: Expert → Sensor → Measured val. → Totalizer					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Totalizer val. 1 to n	1: 2610 to 2611 2: 2810 to 2811 3: 3010 to 3011	Float	Read	Signed floating-point number	54
Tot. overflow 1 to n	1: 2612 to 2613 2: 2812 to 2813 3: 3012 to 3013	Float	Read	Integer with sign	55

"Input values" submenu

"Current input 1 to n" submenu

Navigation: Expert → Sensor → Measured val. → Input values → Current input 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Measured val. 1 to n	1: 6151 to 6152 2: 6153 to 6154 3: 6155 to 6156	Float	Read	Signed floating-point number	56
Measur. curr. 1 to n	1: 6131 to 6132 2: 6133 to 6134 3: 6135 to 6136	Float	Read	0 to 22.5 mA	57

"Val.stat.inp. 1 to n" submenu

Navigation: Expert → Sensor → Measured val. → Input values → Val.stat.inp. 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Val.stat.inp.	1: 2746 2: 4699 3: 4700	Integer	Read	0 = Low 1 = High	57

"Output values" submenu

"Value curr.out 1 to n" submenu

Navigation: Expert → Sensor → Measured val. → Output values → Value curr.out 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Output curr. 1 to n	1: 5931 to 5932 2: 5933 to 5934 3: 5935 to 5936	Float	Read	0 to 22.5 mA	58
Measur. curr. 1 to n	1: 5779 to 5780 2: 5781 to 5782 3: 5783 to 5784	Float	Read	0 to 30 mA	58

"PFS output 1 to n" submenu

Navigation: Expert → Sensor → Measured val. → Output values → PFS output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Output freq. 1 to n	1: 3462 to 3463 2: 3464 to 3465 3: 9910 to 9911	Float	Read	0.0 to 12 500.0 Hz	59
Pulse output 1 to n	1: 3082 to 3083 2: 3084 to 3085 3: 4718 to 4719	Float	Read	Positive floating-point number	59
Switch status 1 to n	1: 2485 2: 2486 3: 9917	Integer	Read	1 = Open 6 = Closed	60

"Relay output 1 to n" submenu

Navigation: Expert → Sensor → Measured val. → Output values → Relay output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Switch status	1: 3518 2: 3519 3: 9875	Integer	Read	1 = Open 6 = Closed	61
Switch cycles	1: 7625 2: 7627 3: 7629	Integer	Read	Positive integer	61
Max. cycles no.	1: 21919 2: 21921 3: 21923	Integer	Read	Positive integer	61

"Double pulse out" submenu

Navigation: Expert → Sensor → Measured val. → Output values → Double pulse out					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Pulse output	7041 to 7042	Float	Read	Positive floating-point number	62

"System units" submenu

Navigation: Expert → Sensor → System units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Volume flow unit	2103	Integer	Read / Write	0 = cm ³ /s 1 = cm ³ /min 2 = cm ³ /h 3 = cm ³ /d 4 = dm ³ /s 5 = dm ³ /min 6 = dm ³ /h 7 = dm ³ /d 8 = m ³ /s 9 = m ³ /min 10 = m³/h (*) 11 = m ³ /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 = MI/s 25 = MI/min 26 = MI/h 27 = MI/d 32 = af/s 33 = af/min 34 = af/h 35 = af/d 36 = ft ³ /s 37 = ft ³ /min 38 = ft ³ /h 39 = ft ³ /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)	63

Navigation: Expert → Sensor → System units					→
Parameter	Register	Data type	Access	Selection / User entry / User interface	
				69 = gal/min (imp) 70 = gal/h (imp) 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) 88 = kgal/s (us) 89 = kgal/min (us) 90 = kgal/h (us) 91 = kgal/d (us) 92 = MMft³/s 93 = MMft³/min 94 = MMft³/h 96 = Mft³/d	
Volume unit	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) 22 = kgal (us) 23 = Mft³ 110 = /fl oz (us) 111 = /gal (us) 112 = /Mgal (us) 113 = /bbl (us;liq.) 114 = /bbl (us;beer) 115 = /bbl (us;oil) 116 = /bbl (us;tank) 117 = /gal (imp) 118 = /Mgal (imp) 119 = /bbl (imp;beer) 120 = /bbl (imp;oil) 122 = /kgal (us) 123 = /MMft³ 173 = /cm³ 174 = /dm³ 175 = /m³ 176 = /ml 177 = /hl 178 = /l 179 = /Ml 180 = /ft³ 181 = /af	65

Navigation: Expert → Sensor → System units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Corr. vol. unit	2106	Integer	Read / Write	100 = Nl 101 = Nm³ (+) 102 = Sm ³ 103 = Sft ³ 104 = Sl 105 = Sgal (us) 106 = Sbbl (us;liq.) 107 = Sgal (imp) 108 = Sbbl (us;oil) 109 = MMSft ³ 110 = Nhl 164 = /Sl 166 = /Nm ³ 167 = /Nl 168 = /Sft ³ 169 = /Sm ³ 170 = /Sbbl (us;liq.) 171 = /Sgal (us) 172 = /Sgal (imp) 178 = /Sbbl (us;oil) 179 = /MMSft ³ 180 = /Nhl	66
Cor.volflow unit	2105	Integer	Read / Write	0 = Nl/s 1 = Nl/min 2 = Nl/h 3 = Nl/d 4 = Nm ³ /s 5 = Nm ³ /min 6 = Nm³/h (+) 7 = Nm ³ /d 8 = Sm ³ /s 9 = Sm ³ /min 10 = Sm ³ /h 11 = Sm ³ /d 12 = Sft ³ /s 13 = Sft ³ /min 14 = Sft ³ /h 15 = Sft ³ /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 = MMSft ³ /s 29 = MMSft ³ /min 30 = MMSft ³ /h 31 = MSft ³ /d 32 = Sbbl/s (us;oil) 33 = Sbbl/min (us;oil) 34 = Sbbl/h (us;oil) 35 = Sbbl/d (us;oil) 36 = Nhl/s 37 = Nhl/min 38 = Nhl/h 39 = Nhl/d 40 = Sl/s 41 = Sl/min 42 = Sl/h 43 = Sl/d	66

Navigation: Expert → Sensor → System units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
Mass flow unit	2101	Integer	Read / Write	0 = g/s 1 = g/min 4 = kg/s 5 = kg/min 6 = kg/h⁽⁺⁾ 7 = kg/d 10 = t/h 11 = t/d 12 = oz/s 13 = oz/min 16 = lb/s 17 = lb/min 18 = lb/h 19 = lb/d 22 = STon/h 23 = STon/d	67
Mass unit	2102	Integer	Read / Write	50 = g 51 = kg⁽⁺⁾ 52 = t 53 = oz 54 = lb 55 = STon 60 = /g 61 = /kg 62 = /t 63 = /lb 64 = /STon 125 = /oz	68
Temperature unit	2109	Integer	Read / Write	0 = °C⁽⁺⁾ 1 = K 2 = °F 3 = °R	69
Pressure unit	2130	Integer	Read / Write	0 = bar 6 = psi 11 = Pa 12 = kPa 237 = MPa	69
Energy unit	5809	Integer	Read / Write	128 = kWh⁽⁺⁾ 129 = GWh 130 = MWh 162 = Mcal 163 = kJ 164 = MJ 165 = Btu 167 = GJ 171 = kcal 172 = MBtu 173 = MMBtu	70

Navigation: Expert → Sensor → System units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Energy flow unit	5786	Integer	Read / Write	0 = MW 1 = kJ/s 2 = kJ/min 3 = kJ/h 4 = kJ/d 7 = MJ/d 11 = kcal/s 12 = kcal/min 13 = kcal/h 14 = kcal/d 16 = MBtu/min 17 = MBtu/h 18 = MBtu/d 21 = MMBtu/h 22 = MMBtu/d 32 = Btu/s 33 = Btu/min 34 = Btu/day 127 = kW⁽⁺⁾ 141 = MJ/h 142 = Btu/h	72
Length unit	2087	Integer	Read / Write	44 = ft 45 = m 47 = in 49 = mm⁽⁺⁾ 240 = µm	72
Velocity unit	2600	Integer	Read / Write	20 = ft/s 21 = m/s⁽⁺⁾	68
Density unit	2107	Integer	Read / Write	0 = g/cm ³ 2 = kg/dm ³ 3 = kg/l 4 = kg/m³ (+) 5 = SD4°C 6 = SD15°C 7 = SD20°C 8 = SG4°C 9 = SG15°C 10 = SG20°C 11 = lb/ft ³ 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) 21 = g/m ³	70
Kin. visc. unit		Integer	Read / Write		
Dyn. visc. unit	2111	Integer	Read / Write	0 = cP 1 = P 2 = Pa s 3 = mPa s	71
Cal. value unit	5785	Integer	Read / Write	0 = kJ/Nm ³ 1 = kWh/Nm³ (+) 2 = kWh/Sm ³ 3 = kJ/Sm ³ 4 = Btu/Sm ³ 5 = MBtu/Sm ³ 6 = MBtu/Sft ³ 7 = Btu/Sft ³ 240 = MJ/Nm ³	71
Spec. enthalpy		Integer	Read / Write		

Navigation: Expert → Sensor → System units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
SpecHeatCapaUnit	26396	Integer	Read / Write	0 = J/(kgK) 1 = kJ/(kgK) 2 = MJ/(kgK) 3 = kWh/(kgK) 4 = kcal/(kgK) 5 = Btu/(lb°R)	73
Date/time format	2150	Integer	Read / Write	0 = dd.mm.yy hh:mm 1 = mm/dd/yy am/pm 2 = dd.mm.yy am/pm 3 = mm/dd/yy hh:mm	73

"Process param." submenu

Navigation: Expert → Sensor → Process param.					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Flow override	5503	Integer	Read / Write	0 = Off 1 = On	74
Flow damping	5510 to 5511	Float	Read / Write	0 to 999.9 s	74
Damp. gas prop.	25344 to 25345	Float	Read / Write	0 to 999.9 s	75
Temp. damping	5508 to 5509	Float	Read / Write	0 to 999.9 s	76
Pressure damping	25492 to 25493	Float	Read / Write	0 to 999.9 s	76

"Low flow cut off" submenu

Navigation: Expert → Sensor → Process param. → Low flow cut off					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Assign variable	5101	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow 3 = Flow velocity 13 = Correct.vol.flow * 38 = Energy flow *	77
On value	5138 to 5139	Float	Read / Write	Positive floating-point number	77
Off value	5104 to 5105	Float	Read / Write	0 to 100.0 %	77

* Visibility depends on order options or device settings

"Measurement mode" submenu

Navigation: Expert → Sensor → Measurement mode					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Select gas type	25261	Integer	Read / Write	1 = Coal gas/bio gas * 2 = Gas mixture * 3 = Natur.gas (std) * 4 = Nat.gas (s.vel.) * 5 = Single gas * 255 = User-spec. gas	78
Density calc.	24707	Integer	Read / Write	1 = AGA Nx19 2 = ISO 12213- 2 3 = ISO 12213- 3	79
Enthalpy calc.	24740	Integer	Read / Write	0 = AGA5 1 = ISO 6976	79

Navigation: Expert → Sensor → Measurement mode					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Ref. conditions	26474	Integer	Read / Write	1 = 1000.00hPa, 0°C 2 = 1000.00hPa, 15°C 3 = 1000.00hPa, 20°C 4 = 1000.00hPa, 25°C 5 = 1013.25hPa, 0°C 6 = 1013.25hPa, 15°C 7 = 1013.25hPa, 20°C 8 = 1013.25hPa, 25°C 9 = 14.696Psi, 59°F 10 = 14.696Psi, 60°F 11 = 14.730Psi, 60°F 22 = Others	79
Ref. pressure	26379 to 26380	Float	Read / Write	0 to 250 bar	80
Ref. temperature	26383 to 26384	Float	Read / Write	-200 to 450 °C	80
Ref. comb. temp.	31823	Integer	Read / Write	0 = 0 °C 15 = 15 °C 20 = 20 °C 25 = 25 °C 60 = 60 °F	80

* Visibility depends on order options or device settings

"Medium property" submenu

Navigation: Expert → Sensor → Measurement mode → Medium property					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Cal. value type	24701	Integer	Read / Write	2 = GrossCalorValVol 4 = NetCalorValVol	81
Input humidity	28555	Integer	Read / Write	1 = Dew point 2 = Water fraction 3 = Rel. humidity	82
Humidity type		Integer	Read / Write		
Ref.density	26375 to 26376	Float	Read / Write	0.01 to 100 kg/m³	82
Ref. GrossCalVal	26377 to 26378	Float	Read / Write	0 to 1000 MJ/Nm³	82
Ref. Z-factor	26385 to 26386	Float	Read / Write	0.1 to 2	82
Relative density	26387 to 26388	Float	Read / Write	0.5 to 1.0	83
Spec. heat cap.	31819 to 31820	Float	Read / Write	0 to 50000 J/(kgK)	83
Spec. heat cap.		Float	Read / Write		
Calorific value	25226 to 25227	Float	Read / Write	0 to 1000 MJ/Nm³	83
Z-factor	25265 to 25266	Float	Read / Write	0.1 to 2.0	83
Dynam. viscosity	25250 to 25251	Float	Read / Write	0 to 0.001 Pa s	84
Add. gas compon.	26401	Integer	Read / Write	9 = Hydrogen H2 18 = Hydrog.sulf. H2S 251 = None	84
Standard volume flow type	31825	Integer	Read / Write	4 = Dry gas 5 = Wet gas	84

"External comp." submenu

Navigation: Expert → Sensor → External comp.					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Fixed density	22563 to 22564	Float	Read / Write	Positive floating-point number	85

"Sensor adjustm." submenu

Navigation: Expert → Sensor → Sensor adjustm.					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Install. direct.	5501	Integer	Read / Write	0 = In arrow direct. 1 = Against arrow	86
Ref. pressure	26727 to 26728	Float	Read / Write	Positive floating-point number	86
Press. cell adj.	6233	Integer	Read / Write	0 = Cancel 1 = Yes 2 = Discard offset	86
p cell offs.val	26729 to 26730	Float	Read	Signed floating-point number	86

"Variable adjust" submenu

Navigation: Expert → Sensor → Sensor adjustm. → Variable adjust					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Vol. flow offset	5521 to 5522	Float	Read / Write	Signed floating-point number	88
Vol. flow factor	5519 to 5520	Float	Read / Write	Positive floating-point number	88
Mass flow offset	5525 to 5526	Float	Read / Write	Signed floating-point number	89
Mass flow factor	5523 to 5524	Float	Read / Write	Positive floating-point number	90
S. veloc. offset	5529 to 5530	Float	Read / Write	Signed floating-point number	90
S. veloc. factor	5527 to 5528	Float	Read / Write	Positive floating-point number	90
En. flow offset	2044 to 2045	Float	Read / Write	Signed floating-point number	95
En. flow factor	2076 to 2077	Float	Read / Write	Positive floating-point number	95
Temp. factor	5531 to 5532	Float	Read / Write	Positive floating-point number	91
Temp. offset	5533 to 5534	Float	Read / Write	Signed floating-point number	91
Wobbe index factor	21554 to 21555	Float	Read / Write	Positive floating-point number	95
Wobbe index offset	21556 to 21557	Float	Read / Write	Signed floating-point number	94
Corr. vol offset	5817 to 5818	Float	Read / Write	Signed floating-point number	89
Corr. vol factor	5825 to 5826	Float	Read / Write	Positive floating-point number	89
Pressure offset	23110 to 23111	Float	Read / Write	Signed floating-point number	91
Pressure factor	23112 to 23113	Float	Read / Write	Positive floating-point number	92
Methane offset	23114 to 23115	Float	Read / Write	Signed floating-point number	92
Methane factor	25263 to 25264	Float	Read / Write	Positive floating-point number	92
Molar mass offset	25304 to 25305	Float	Read / Write	Signed floating-point number	92
Molar mass factor	25320 to 25321	Float	Read / Write	Positive floating-point number	93
Density offset	25324 to 25325	Float	Read / Write	Signed floating-point number	93
Density factor	25336 to 25337	Float	Read / Write	Positive floating-point number	93
Dynamic viscosity offset	25500 to 25501	Float	Read / Write	Signed floating-point number	93
Dynamic viscosity factor	25508 to 25509	Float	Read / Write	Positive floating-point number	94

Navigation: Expert → Sensor → Sensor adjustm. → Variable adjust					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Calorific value offset	25516 to 25517	Float	Read / Write	Signed floating-point number	94
Calorific value factor	25542 to 25543	Float	Read / Write	Positive floating-point number	94

"Calibration" submenu

Navigation: Expert → Sensor → Calibration					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Cal. factor	4559 to 4560	Float	Read	Signed floating-point number	96
Zero point	4963 to 4964	Float	Read	Signed floating-point number	96
Nominal diameter	2048 to 2057	String	Read	DNxx / x"	96

6.3.3 "I/O config." submenu

Navigation: Expert → I/O config.					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
I/O 1 to n terminals	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)	97
I/O 1 to n info	1: 8659 2: 8660 3: 8661 4: 8662	Integer	Read	1 = MODBUS 2 = Configurable 3 = Not configurable 254 = Not plugged 255 = Invalid	97
I/O 1 to n type	1: 6417 2: 6418 3: 6419 4: 6420	Integer	Read / Write	0 = Off 0 = Curr.output * 0 = Current input * 0 = Status input * 0 = PFS output * 4 = Double pulse out * 6 = Relay output *	98
Apply I/O config	8665	Integer	Read / Write	0 = Yes 1 = No	98
Alteration code	6427	Integer	Read / Write	Positive integer	99

* 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 no.	1: 6548 2: 6549 3: 6550	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3)	100
Signal mode	1: 6424 2: 6425 3: 6426	Integer	Read / Write	0 = Passive 2 = Active	100

Navigation: Expert → Input → Current input 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Current span	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	100
0/4 mA value	1: 6111 to 6112 2: 6113 to 6114 3: 6115 to 6116	Float	Read / Write	Signed floating-point number	101
20 mA value	1: 6119 to 6120 2: 6121 to 6122 3: 6123 to 6124	Float	Read / Write	Signed floating-point number	101
Failure mode	1: 6159 2: 6160 3: 6161	Integer	Read / Write	1 = Last valid value 2 = Alarm 6 = Defined value	101
Failure value	1: 6163 to 6164 2: 6165 to 6166 3: 6167 to 6168	Float	Read / Write	Signed floating-point number	102

"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 no.	1: 6554 2: 6555 3: 6556	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3)	102
Assign stat.inp.	1: 2506 2: 4687 3: 4688	Integer	Read / Write	0 = Off 1 = Flow override 2 = Reset all tot. 3 = Reset totaliz. 1 4 = Reset totaliz. 2 5 = Reset totaliz. 3	103
Val.stat.inp.	1: 2746 2: 4699 3: 4700	Integer	Read	0 = Low 1 = High	103
Active level	1: 2530 2: 4690 3: 4691	Integer	Read / Write	0 = Low 1 = High	104
Response time	1: 3404 to 3405 2: 5753 to 5754 3: 5755 to 5756	Float	Read / Write	5 to 200 ms	104

6.3.5 "Output" submenu

"Curr.output 1 to n" submenu

Navigation: Expert → Output → Curr.output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Terminal no.	1: 6545 2: 6546 3: 6547	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3)	105
Signal mode	1: 6421 2: 6422 3: 6423	Integer	Read / Write	0 = Passive 2 = Active	105

Navigation: Expert → Output → Curr.output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Assign curr. 1 to n	1: 5927 2: 5928 3: 5929	Integer	Read / Write	0 = Off * 1 = Mass flow 2 = Volume flow 3 = Flow velocity 4 = Sound velocity 8 = Temperature * 9 = Methane fraction * 10 = Molar mass * 11 = Flow asymmetry * 12 = Dynam. viscosity * 13 = Correct.vol.flow * 14 = Density * 15 = Signal strength * 16 = SNR * 17 = Turbulence * 20 = Acceptance rate * 21 = Wobbe index * 22 = Pressure * 23 = Calorific value * 38 = Energy flow * 39 = Electronic temp.	106
Current span	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	106
Fixed current	1: 5987 to 5988 2: 5989 to 5990 3: 5991 to 5992	Float	Read / Write	0 to 22.5 mA	107
0/4 mA value	1: 6195 to 6196 2: 6197 to 6198 3: 6199 to 6200	Float	Read / Write	Signed floating-point number	108
20 mA value	1: 5915 to 5916 2: 5917 to 5918 3: 5919 to 5920	Float	Read / Write	Signed floating-point number	109
Measuring mode	1: 5899 2: 5900 3: 5901	Integer	Read / Write	0 = Forward flow 2 = Rev. flow comp. 13 = Forward/Reverse *	110
Damping out. 1 to n	1: 5903 to 5904 2: 5905 to 5906 3: 5907 to 5908	Float	Read / Write	0.0 to 999.9 s	114
Response time	1: 5867 to 5868 2: 5869 to 5870 3: 5871 to 5872	Float	Read	Positive floating-point number	115
Failure mode	1: 5911 2: 5912 3: 5913	Integer	Read / Write	0 = Min. 1 = Max. 4 = Actual value 5 = Last valid value 6 = Defined value	115
Failure current	1: 5979 to 5980 2: 5981 to 5982 3: 5983 to 5984	Float	Read / Write	0 to 22.5 mA	116
Output curr. 1 to n	1: 5931 to 5932 2: 5933 to 5934 3: 5935 to 5936	Float	Read	3.59 to 22.5 mA	117
Measur. curr. 1 to n	1: 5779 to 5780 2: 5781 to 5782 3: 5783 to 5784	Float	Read	0 to 30 mA	117

* Visibility depends on order options or device settings

"PFS output 1 to n" submenu

Navigation: Expert → Output → PFS output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Terminal no.	1: 6551 2: 6552 3: 6553	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3)	118
Signal mode	1: 6235 2: 6236 3: 6237	Integer	Read / Write	0 = Passive 2 = Active 3 = Passive NAMUR	119
Operating mode	1: 4479 2: 4480 3: 9907	Integer	Read / Write	0 = Pulse 1 = Switch 53 = Frequency	119
Assign pulse 1 to n	1: 2461 2: 2462 3: 4685	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow 13 = Correct.vol.flow * 38 = Energy flow *	121
Pulse scaling	1: 3034 to 3035 2: 3036 to 3037 3: 4714 to 4715	Float	Read / Write	Positive floating point number	121
Pulse width	1: 2836 to 2837 2: 2838 to 2839 3: 4702 to 4703	Float	Read / Write	0.05 to 2 000 ms	122
Measuring mode	1: 2394 2: 2395 3: 4683	Integer	Read / Write	0 = Forward flow 1 = Reverse flow 2 = Rev. flow comp. 13 = Forward/Reverse	122
Failure mode	1: 2948 2: 2949 3: 4708	Integer	Read / Write	0 = Actual value 1 = No pulses	123
Pulse output 1 to n	1: 3082 to 3083 2: 3084 to 3085 3: 4718 to 4719	Float	Read	Positive floating-point number	124
Assign freq.	1: 2614 2: 2615 3: 9915	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow 3 = Flow velocity 4 = Sound velocity 8 = Temperature * 9 = Methane fraction * 10 = Molar mass * 11 = Flow asymmetry * 12 = Dynam. viscosity * 13 = Correct.vol.flow * 14 = Density * 15 = Signal strength * 16 = SNR * 17 = Turbulence * 20 = Acceptance rate * 21 = Wobbe index * 22 = Pressure * 23 = Calorific value * 24 = Test point 1 * 25 = Test point 2 * 38 = Energy flow * 39 = Electronic temp.	124
Min. freq. value	1: 3526 to 3527 2: 3528 to 3529 3: 5767 to 5768	Float	Read / Write	0.0 to 10 000.0 Hz	125

Navigation: Expert → Output → PFS output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Max. freq. value	1: 2996 to 2997 2: 2998 to 2999 3: 4710 to 4711	Float	Read / Write	0.0 to 10 000.0 Hz	125
Val. at min.freq	1: 5887 to 5888 2: 5889 to 5890 3: 5891 to 5892	Float	Read / Write	Signed floating-point number	126
Val. at max.freq	1: 3514 to 3515 2: 3516 to 3517 3: 5759 to 5760	Float	Read / Write	Signed floating-point number	126
Measuring mode	1: 2922 2: 2923 3: 4706	Integer	Read / Write	0 = Forward flow 2 = Rev. flow comp. 13 = Forward/Reverse	126
Damping out. 1 to n	1: 3522 to 3523 2: 3524 to 3525 3: 5763 to 5764	Float	Read / Write	0 to 999.9 s	127
Response time	1: 5875 to 5876 2: 5877 to 5878 3: 5879 to 5880	Float	Read	Positive floating-point number	127
Failure mode	1: 2367 2: 2368 3: 4681	Integer	Read / Write	0 = Actual value 1 = 0 Hz 2 = Defined value	128
Failure freq.	1: 3510 to 3511 2: 3512 to 3513 3: 9908 to 9909	Float	Read / Write	0.0 to 12 500.0 Hz	128
Output freq. 1 to n	1: 3462 to 3463 2: 3464 to 3465 3: 9910 to 9911	Float	Read	0.0 to 12 500.0 Hz	129
Switch out funct	1: 3022 2: 3023 3: 9914	Integer	Read / Write	0 = Off 1 = On 2 = Diag. behavior 3 = Fl. direct.check 4 = Limit 5 = Status	129
Assign diag. beh	1: 3096 2: 3097 3: 9913	Integer	Read / Write	0 = Alarm 1 = Warning 2 = Alarm or warning	130
Assign limit	1: 3184 2: 3185 3: 4722	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow 3 = Flow velocity 4 = Sound velocity 5 = Totalizer 1 6 = Totalizer 2 7 = Totalizer 3 8 = Temperature * 9 = Methane fraction * 10 = Molar mass * 11 = Flow asymmetry * 12 = Dynam. viscosity * 13 = Correct.vol.flow * 14 = Density * 15 = Signal strength * 16 = SNR * 17 = Turbulence * 20 = Acceptance rate * 21 = Wobbe index * 22 = Pressure * 23 = Calorific value * 38 = Energy flow * 39 = Electronic temp.	130

Navigation: Expert → Output → PFS output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Switch-on value	1: 3242 to 3243 2: 3244 to 3245 3: 4728 to 4729	Float	Read / Write	Signed floating-point number	132
Switch-off value	1: 3234 to 3235 2: 3236 to 3237 3: 4724 to 4725	Float	Read / Write	Signed floating-point number	133
Assign dir.check	1: 3363 2: 3364 3: 4732	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow 3 = Flow velocity 13 = Correct.vol.flow * 38 = Energy flow *	133
Assign status	1: 3374 2: 3375 3: 4734	Integer	Read / Write	0 = Off 1 = Low flow cut off	134
Switch-on delay	1: 6247 to 6248 2: 6249 to 6250 3: 6251 to 6252	Float	Read / Write	0.0 to 100.0 s	134
Switch-off delay	1: 6239 to 6240 2: 6241 to 6242 3: 6243 to 6244	Float	Read / Write	0.0 to 100.0 s	134
Failure mode	1: 3384 2: 3385 3: 9912	Integer	Read / Write	0 = Actual status 1 = Open 6 = Closed	135
Switch status 1 to n	1: 2485 2: 2486 3: 9917	Integer	Read	1 = Open 6 = Closed	135
Invert outp.sig.	1: 2583 2: 2584 3: 9916	Integer	Read / Write	0 = Yes 1 = No	136

* 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 no.	1: 8278 2: 8279 3: 8280	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3)	137
Relay outp.func.	1: 2488 2: 2489 3: 9876	Integer	Read / Write	1 = Open 2 = Diag. behavior 3 = Fl. direct.check 4 = Limit 5 = Digital Output 6 = Closed	137
Assign dir.check	1: 8251 2: 8252 3: 8253	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow 3 = Flow velocity 13 = Correct.vol.flow * 38 = Energy flow *	138

Navigation: Expert → Output → Relay output 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Assign limit	1: 8248 2: 8249 3: 8250	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow 3 = Flow velocity 4 = Sound velocity 5 = Totalizer 1 6 = Totalizer 2 7 = Totalizer 3 8 = Temperature * 9 = Methane fraction * 10 = Molar mass * 11 = Flow asymmetry * 12 = Dynam. viscosity * 13 = Correct.vol.flow * 14 = Density * 15 = Signal strength * 16 = SNR * 17 = Turbulence * 20 = Acceptance rate * 21 = Wobbe index * 22 = Pressure * 23 = Calorific value * 38 = Energy flow * 39 = Electronic temp.	138
Assign diag. beh	1: 8245 2: 8246 3: 8247	Integer	Read / Write	0 = Alarm 1 = Warning 2 = Alarm or warning	139
Assign status	1: 8272 2: 8273 3: 8274	Integer	Read / Write	0 = Off 1 = Low flow cut off	140
Switch-off value	1: 8260 to 8261 2: 8262 to 8263 3: 8264 to 8265	Float	Read / Write	Signed floating-point number	140
Switch-off delay	1: 8254 to 8255 2: 8256 to 8257 3: 8258 to 8259	Float	Read / Write	0.0 to 100.0 s	140
Switch-on value	1: 8233 to 8234 2: 8235 to 8236 3: 8237 to 8238	Float	Read / Write	Signed floating-point number	141
Switch-on delay	1: 8266 to 8267 2: 8268 to 8269 3: 8270 to 8271	Float	Read / Write	0.0 to 100.0 s	141
Failure mode	1: 8242 2: 8243 3: 8244	Integer	Read / Write	0 = Actual status 1 = Open 6 = Closed	141
Switch status	1: 3518 2: 3519 3: 9875	Integer	Read	1 = Open 6 = Closed	142
Powerless relay	1: 7009 2: 7010 3: 7011	Integer	Read / Write	1 = Open 6 = Closed	142

* Visibility depends on order options or device settings

"Double pulse out" submenu

Navigation: Expert → Output → Double pulse out					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Master term. no.	5838	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3)	143
Slave term. no.	5845	Integer	Read	0 = Not used 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3)	143
Signal mode	5949	Integer	Read / Write	0 = Passive 2 = Active 3 = Passive NAMUR	144
Assign pulse 1	5993	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow 13 = Correct.vol.flow * 38 = Energy flow *	144
Value per pulse	7495 to 7496	Float	Read / Write	Signed floating-point number	144
Pulse width	6998 to 6999	Float	Read / Write	0.5 to 2 000 ms	145
Phase shift	6089	Integer	Read / Write	0 = 90° 1 = 180°	145
Measuring mode	6001	Integer	Read / Write	0 = Forward flow 1 = Reverse flow 2 = Rev. flow comp. 13 = Forward/Reverse	145
Failure mode	6009	Integer	Read / Write	0 = Actual value 1 = No pulses	146
Pulse output	7041 to 7042	Float	Read	Positive floating-point number	147
Invert outp.sig.	6101	Integer	Read / Write	0 = Yes 1 = No	147

* Visibility depends on order options or device settings

6.3.6 "Communication" submenu**"Modbus config." submenu**

Navigation: Expert → Communication → Modbus config.					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Bus address	4910	Integer	Read / Write	1 to 247	148
Baudrate	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	149
Data trans. mode	4913	Integer	Read / Write	0 = RTU 1 = ASCII	149
Parity	4914	Integer	Read / Write	0 = Even 1 = Odd 2 = None/2 stop bits 3 = None/1 stop bit	149

Navigation: Expert → Communication → Modbus config.

Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Byte order	4915	Integer	Read / Write	0 = 0-1-2-3 1 = 3-2-1-0 2 = 2-3-0-1 3 = 1-0-3-2	150
Telegram delay	4916 to 4917	Float	Read / Write	0 to 100 ms	151
Failure mode	4920	Integer	Read / Write	1 = Last valid value 255 = NaN value	151
Bus termination	5774	Integer	Read	0 = Off 1 = On	152
Fieldb.writ.acc.	6807	Integer	Read / Write	0 = Read + write 1 = Read only	152

"Modbus info" submenu**Navigation: Expert → Communication → Modbus info**

Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Device ID	2547	Integer	Read	4-digit hexadecimal number	153
Device revision	4481	Integer	Read	4-digit hexadecimal number	153

"Modbus data map" submenu**Navigation: Expert → Communication → Modbus data map**

Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Scan list reg.0 to 15	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	154

"WLAN settings" wizard**Navigation: Expert → Communication → WLAN settings**

Parameter	Register	Data type	Access	Selection / User entry / User interface	→
WLAN	6178	Integer	Read / Write	0 = Disable 1 = Enable	158
WLAN mode	28777	Integer	Read / Write	0 = Access point 1 = WLAN Client	159
SSID name	28940 to 28955	String	Read / Write	-	159

Navigation: Expert → Communication → WLAN settings					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Network security	6206	Integer	Read / Write	0 = Unsecured 1 = WPA2-PSK 2 = EAP-PEAP MSCHAP2 * 3 = EAP-TLS * 4 = EAP-PEAP NoAuth. *	159
Sec. identific.	28817	Integer	Read	1 = Trust. iss.cert. 2 = Device certific. 4 = Dev. private key	160
User name	28956 to 28971	String	Read / Write	-	160
WLAN password	28972 to 28987	String	Read / Write	-	160
WLAN IP address	8643 to 8649.5	String	Read / Write	4 octet: 0 to 255 (in the particular octet)	160
WLAN MAC address	8602 to 8609.5	String	Read	Unique 12-digit character string comprising letters and numbers	161
WLAN subnet mask	8651 to 8657.5	String	Read / Write	4 octet: 0 to 255 (in the particular octet)	161
WLAN MAC address	8602 to 8609.5	String	Read	Unique 12-digit character string comprising letters and numbers	161
WLAN passphrase	8611 to 8626	String	Read / Write	8 to 32-digit character string comprising numbers, letters and special characters (without spaces)	161
Assign SSID name	6218	Integer	Read / Write	0 = Device tag 1 = User-defined	162
SSID name	8627 to 8642	String	Read / Write	Max. 32-digit character string comprising numbers, letters and special characters	162
WLAN channel	6182	Integer	Read / Write	1 to 11	162
Select antenna	6102	Integer	Read / Write	0 = External antenna 1 = Internal antenna	163
Connection state	29221	Integer	Read	0 = Not connected 1 = Connected	163
Rec.sig.strength	28818	Integer	Read	0 = Low 1 = High 2 = Medium	163
WLAN IP address	8643 to 8649.5	String	Read / Write	4 octet: 0 to 255 (in the particular octet)	160
Gateway IP addr.	29227 to 29233.5	String	Read		163
IP address DNS	29283 to 29289.5	String	Read		164

* Visibility depends on order options or device settings

6.3.7 "Application" submenu

Navigation: Expert → Application					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Reset all tot.	2609	Integer	Read / Write	0 = Cancel 1 = Reset + totalize	164

"Totalizer 1 to n" submenu

Navigation: Expert → Application → Totalizer 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Assign variable	1: 2601 2: 2801 3: 3001	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow 13 = Correct.vol.flow * 38 = Energy flow *	165
Unit totalizer 1 to n	1: 4604 2: 4605 3: 4606	Integer	Read / Write	0 = cm ³ * 1 = dm ³ * 2 = m ³ * 3 = ml * 4 = l * 5 = hl * 6 = Ml Mega * 8 = af * 9 = ft ³ * 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) * 22 = kgal (us) * 23 = Mft ³ * 50 = g * 51 = kg * 52 = t * 53 = oz * 54 = lb * 55 = STon * 100 = NI * 101 = Nm ³ * 102 = Sm ³ * 103 = Sft ³ * 104 = SI * 105 = Sgal (us) * 106 = Sbbl (us;liq.) * 107 = Sgal (imp) * 108 = Sbbl (us;oil) * 109 = MMSft ³ * 110 = Nhl * 128 = kWh * 129 = GWh * 130 = MWh * 162 = Mcal * 163 = kJ * 164 = MJ * 165 = Btu * 167 = GJ * 170 = Gcal * 171 = kcal * 172 = MBtu * 173 = MMBtu * 251 = None *	166
Operation mode	1: 2605 2: 2805 3: 3005	Integer	Read / Write	0 = Net flow total 1 = Forward total 2 = Reverse total	167

Navigation: Expert → Application → Totalizer 1 to n					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Control Tot. 1 to n	1: 2608 2: 2808 3: 3008	Integer	Read / Write	0 = Totalize 1 = Reset + hold 2 = Preset + hold 3 = Reset + totalize 3 = Hold 4 = Preset+totalize	168
Preset value 1 to n	1: 2590 to 2591 2: 2592 to 2593 3: 2594 to 2595	Float	Read / Write	Signed floating-point number	168
Failure mode	1: 2606 2: 2806 3: 3006	Integer	Read / Write	0 = Stop 1 = Actual value 2 = Last valid value	169

* 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 diagnos.	2732	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	171
Prev.diagnostics	2734	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	172
Time fr. restart	2624	Integer	Read	Days (d), hours (h), minutes (m) and seconds (s)	173
Operating time	2631	Integer	Read	Days (d), hours (h), minutes (m) and seconds (s)	173

"Diagnostic list" submenu

Navigation: Expert → Diagnostics → Diagnostic list					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Diagnostics 1	2736	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	174
Diagnostics 2	2738	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	174
Diagnostics 3	2740	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	175
Diagnostics 4	2742	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	176
Diagnostics 5	2744	Integer	Read	Symbol for diagnostic behavior, diagnostic code and short message.	177

"Event logbook" submenu

Navigation: Expert → Diagnostics → Event logbook					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Filter options	4596	Integer	Read / Write	0 = Failure (F) 4 = Mainten. req.(M) 8 = Funct. check (C) 12 = Out of spec. (S) 16 = Information (I) 255 = All	178

"Event list" submenu**"Device info" submenu**

Navigation: Expert → Diagnostics → Device info					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Device tag	2026 to 2041	String	Read	Max. 32 characters, such as letters, numbers or special characters (e.g. @, %, /).	180
Serial number	7003 to 7007.5	String	Read	Max. 11-digit character string comprising letters and numbers.	181
Firmware version	7277 to 7280	String	Read	Character string in the format xx.yy.zz	181
Device name	7238 to 7245	String	Read	Prosonic Flow 300	182
Order code	2058 to 2067	String	Read	Character string composed of letters, numbers and certain punctuation marks (e.g. /).	182
Ext. order cd. 1	2212 to 2221	String	Read	Character string	182
Ext. order cd. 2	2222 to 2231	String	Read	Character string	183
Ext. order cd. 3	2232 to 2241	String	Read	Character string	183
ENP version	4003 to 4010	String	Read	Character string	183

"Main elec.+I/O1" submenu

Navigation: Expert → Diagnostics → Main elec.+I/O1					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Software rev.	7039	Integer	Read	Positive integer	184
Build no. softw.	2326	Integer	Read	Positive integer	184
Bootloader rev.	2264	Integer	Read	Positive integer	184

"Sens. electronic" submenu

Navigation: Expert → Diagnostics → Sens. electronic					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Software rev.	7039	Integer	Read	Positive integer	185
Build no. softw.	2326	Integer	Read	Positive integer	185
Bootloader rev.	2264	Integer	Read	Positive integer	185

"I/O module 2" submenu

Navigation: Expert → Diagnostics → I/O module 2					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
I/O 2 terminals	6542	Integer	Read	0 = Not used 1 = 26-27 (I/O 1) 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3)	186
Software rev.	7039	Integer	Read	Positive integer	186
Build no. softw.	2326	Integer	Read	Positive integer	186
Bootloader rev.	2264	Integer	Read	Positive integer	186

"I/O module 3" submenu

Navigation: Expert → Diagnostics → I/O module 3					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
I/O 3 terminals	6543	Integer	Read	0 = Not used 1 = 26-27 (I/O 1) 2 = 24-25 (I/O 2) 3 = 22-23 (I/O 3)	186
Software rev.	7039	Integer	Read	Positive integer	186
Build no. softw.	2326	Integer	Read	Positive integer	186
Bootloader rev.	2264	Integer	Read	Positive integer	186

"Display module" submenu

Navigation: Expert → Diagnostics → Display module					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Software rev.	7039	Integer	Read	Positive integer	189
Build no. softw.	2326	Integer	Read	Positive integer	190
Bootloader rev.	2264	Integer	Read	Positive integer	190

"Data logging" submenu

Navigation: Expert → Diagnostics → Data logging					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
Assign chan. 1	2445	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow 3 = Flow velocity 4 = Sound velocity 8 = Temperature * 9 = Methane fraction * 10 = Molar mass * 11 = Flow asymmetry * 12 = Dynam. viscosity * 13 = Correct.vol.flow 14 = Density * 15 = Signal strength * 16 = SNR * 17 = Turbulence * 20 = Acceptance rate * 21 = Wobbe index * 22 = Pressure * 23 = Calorific value * 38 = Energy flow 39 = Electronic temp. 121 = Curr.output 1 122 = Curr.output 2 * 123 = Curr.output 3 * 124 = Curr.output 4 *	191
Assign chan. 2	2446	Integer	Read / Write	Picklist, see Assign channel 1 parameter (→  191)	192
Assign chan. 3	2548	Integer	Read / Write	Picklist, see Assign channel 1 parameter (→  191)	192
Assign chan. 4	4286	Integer	Read / Write	Picklist, see Assign channel 1 parameter (→  191)	193
Logging interval	4288 to 4289	Float	Read / Write	0.1 to 3 600.0 s	193
Clear logging	4287	Integer	Read / Write	0 = Cancel 2 = Clear data	194
Data logging	5950	Integer	Read / Write	0 = Overwriting 1 = Not overwriting	194
Logging delay	5938	Integer	Read / Write	0 to 999 h	194
Data log.control	5930	Integer	Read / Write	0 = None 1 = Stop 2 = Delete + start	195
Data log. status	5937	Integer	Read	0 = Done 1 = Stopped 2 = Active 3 = Delay active	195
Logging duration	2827 to 2828	Float	Read	Positive floating-point number	196

* 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 proc.var.	6813	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow 3 = Flow velocity 4 = Sound velocity 8 = Temperature * 9 = Methane fraction * 10 = Molar mass * 12 = Dynam. viscosity * 13 = Correct.vol.flow * 14 = Density * 21 = Wobbe index * 22 = Pressure * 23 = Calorific value * 38 = Energy flow *	199
Proc. var. value	6814 to 6815	Float	Read / Write	Depends on the process variable selected	200
Status inp.sim	2620	Integer	Read / Write	0 = Off 1 = On	200
Signal level	2638	Integer	Read / Write	0 = Low 1 = High	201
Curr.inp 1 to n sim.	1: 6127 2: 6128 3: 6129	Integer	Read / Write	0 = Off 1 = On	201
Value curr.inp 1 to n	1: 6139 to 6140 2: 6141 to 6142 3: 6143 to 6144	Float	Read / Write	0 to 22.5 mA	202
Curr.out. 1 to n sim.	1: 5939 2: 5940 3: 5941	Integer	Read / Write	0 = Off 1 = On	202
Value curr.out 1 to n	1: 5995 to 5996 2: 5997 to 5998 3: 5999 to 6000	Float	Read / Write	3.59 to 22.5 mA	203
FreqOutputSim 1 to n	1: 6203 2: 6204 3: 6205	Integer	Read / Write	0 = Off 1 = On	203
Freq value 1 to n	1: 6207 to 6208 2: 6209 to 6210 3: 6211 to 6212	Float	Read / Write	0.0 to 12 500.0 Hz	203
Puls.outp.sim. 1 to n	1: 6215 2: 6216 3: 6217	Integer	Read / Write	0 = Off 1 = Down-count. val. 2 = Fixed value	204
Pulse value 1 to n	1: 6219 2: 6220 3: 6221	Integer	Read / Write	0 to 65 535	204
Switch sim. 1 to n	1: 6223 2: 6224 3: 6225	Integer	Read / Write	0 = Off 1 = On	205
Switch status 1 to n	1: 6227 2: 6228 3: 6229	Integer	Read / Write	1 = Open 6 = Closed	205
Relay out. 1 to n sim	1: 7523 2: 7524 3: 7525	Integer	Read / Write	0 = Off 1 = On	206

Navigation: Expert → Diagnostics → Simulation					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Switch status 1 to n	1: 8239 2: 8240 3: 8241	Integer	Read / Write	1 = Open 6 = Closed	206
Puls.outp.sim.	5957	Integer	Read / Write	0 = Off 1 = Down-count. val. 2 = Fixed value	207
Pulse value	5973	Integer	Read / Write	0 to 65 535	207
Dev. alarm sim.	6812	Integer	Read / Write	0 = Off 1 = On	207
Event category	4261	Integer	Read / Write	0 = Sensor 1 = Electronics 2 = Configuration 3 = Process	208
Diag. event sim.	4259	Integer	Read / Write	<ul style="list-style-type: none">■ Off■ Diagnostic event picklist (depends on the category selected)	208

* Visibility depends on order options or device settings

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