

Description of Device Parameters

Proline Prosonic Flow G 500

Ultrasonic time-of-flight flowmeter
HART

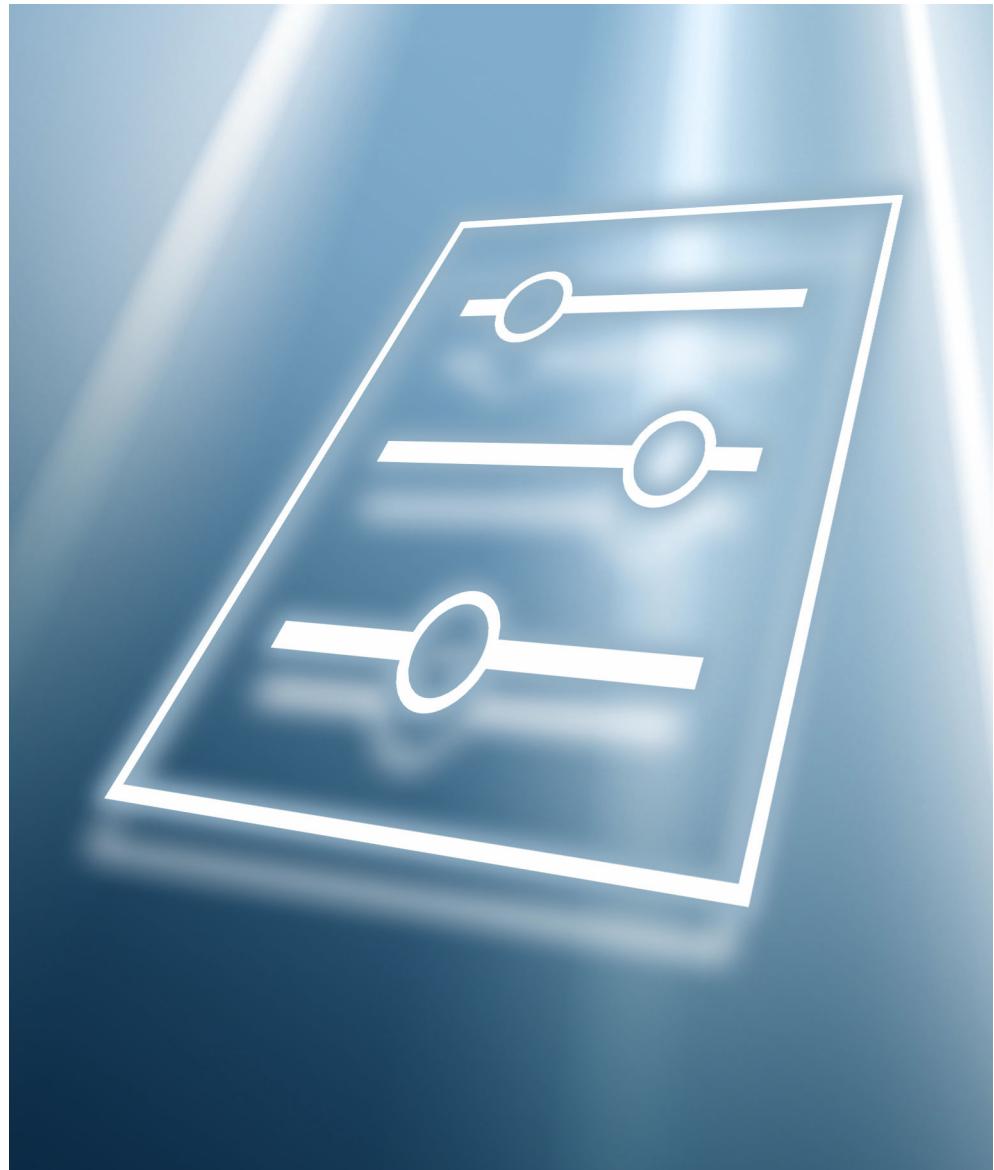


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1 About this document

1.1 Document function

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

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

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

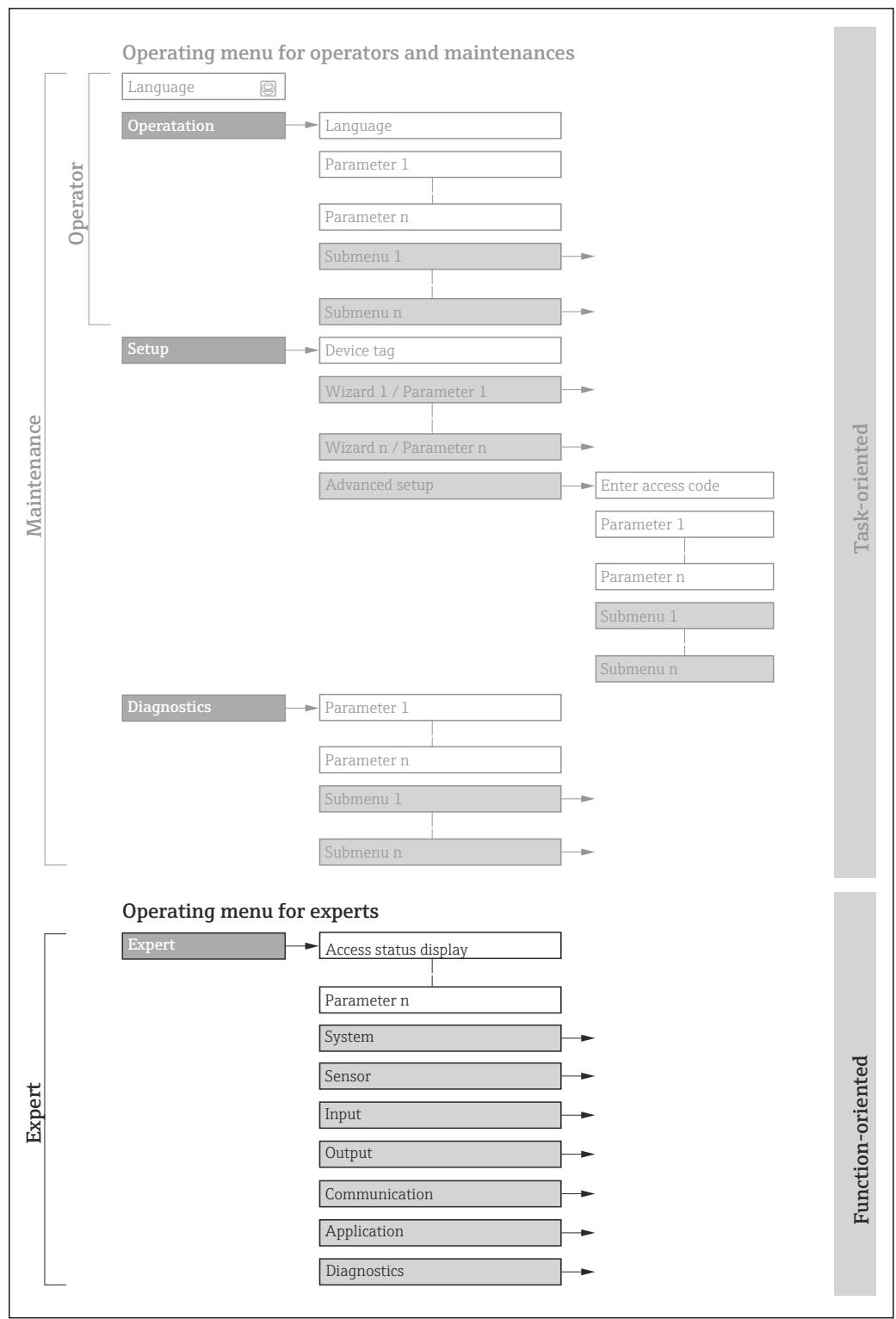
1.2 Target group

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

1.3 Using this document

1.3.1 Information on the document structure

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



1 Sample graphic for the schematic layout of the operating menu



Additional information regarding:

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

1.3.2 Structure of a parameter description

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

Complete parameter name	Write-protected parameter = 
Navigation	 Navigation path to the parameter via the local display (direct access code) or Web browser  Navigation path to the parameter via the operating tool The names of the menus, submenus and parameters are abbreviated to the form in which they appear on the display and in the operating tool.
Prerequisite	The parameter is only available under these specific conditions
Description	Description of the parameter function
Options	List of the individual options for the parameter <ul style="list-style-type: none"> ▪ Option 1 ▪ Option 2
User entry	Parameter entry range
Display	Display value/data of the parameter
Factory setting	Default setting ex works
Additional information	Additional explanations (e.g. in examples): <ul style="list-style-type: none"> ▪ 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 <small>A0028662</small>
	Operation via operating tool <small>A0028663</small>
	Write-protected parameter <small>A0028665</small>

1.4.2 Symbols in graphics

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 500	BA01836D

1.5.2 Supplementary device-dependent documentation

Special Documentation

Contents	Documentation code
Information on the Pressure Equipment Directive	SD01614D
Radio approvals for WLAN interface for A309/A310 display module	SD01793D
Advanced gas analysis	SD02351D
Heartbeat Technology	SD02304D
Web server	SD02311D

2 Overview of the Expert operating menu

The following table provides an overview of the menu structure of the expert operating menu and its parameters. The page reference indicates where the associated description of the submenu or parameter can be found.

Expert	
Direct access (0106)	→ 11
Locking status (0004)	→ 12
User role (0005)	→ 13
Enter access code (0003)	→ 13
 System	→ 13
► Display	→ 14
► Configuration backup	→ 26
► Diagnostic handling	→ 29
► Administration	→ 39
 Sensor	→ 44
► Measured values	→ 45
► System units	→ 61
► Process parameters	→ 72
► Measurement mode	→ 76
► External compensation	→ 85
► Sensor adjustment	→ 88
► Calibration	→ 99
 I/O configuration	→ 100
I/O module 1 to n terminal numbers (3902-1 to n)	→ 100
I/O module 1 to n information (3906-1 to n)	→ 100

I/O module 1 to n type (3901-1 to n)	→ 101
Apply I/O configuration (3907)	→ 101
I/O alteration code (2762)	→ 102
▶ Input	→ 102
▶ Current input 1 to n	→ 102
▶ Status input 1 to n	→ 105
▶ Output	→ 107
▶ Current output 1 to n	→ 108
▶ Pulse/frequency/switch output 1 to n	→ 121
▶ Relay output 1 to n	→ 142
▶ Double pulse output	→ 148
▶ Communication	→ 153
▶ HART input	→ 153
▶ HART output	→ 159
▶ Diagnostic configuration	→ 179
▶ Web server	→ 176
▶ WLAN settings	→ 190
▶ Application	→ 196
Reset all totalizers (2806)	→ 197
▶ Totalizer 1 to n	→ 197
▶ Diagnostics	→ 202
Actual diagnostics (0691)	→ 203
Previous diagnostics (0690)	→ 204
Operating time from restart (0653)	→ 204

Operating time (0652)	→ 205
► Diagnostic list	→ 205
► Event logbook	→ 209
► Device information	→ 211
► Main electronic module + I/O module 1	→ 215
► Sensor electronic module (ISEM)	→ 216
► I/O module 2	→ 217
► I/O module 3	→ 218
► I/O module 4	→ 219
► Display module	→ 221
► Data logging	→ 222
► Heartbeat Technology	→ 230
► Simulation	→ 240

3 Description of device parameters

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

Expert	
Direct access (0106)	→ 11
Locking status (0004)	→ 12
User role (0005)	→ 13
Enter access code (0003)	→ 13
▶ System	→ 13
▶ Sensor	→ 44
▶ I/O configuration	→ 100
▶ Input	→ 102
▶ Output	→ 107
▶ Communication	→ 153
▶ Application	→ 196
▶ Diagnostics	→ 202

Direct access



Navigation

Expert → Direct access (0106)

Description

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

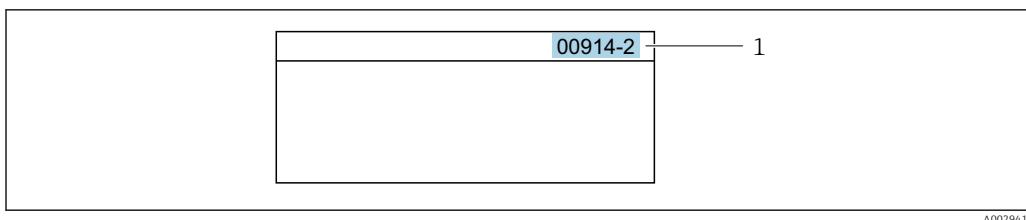
User entry

0 to 65 535

Additional information

User entry

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



1 Direct access code

Note the following when entering the direct access code:

- The leading zeros in the direct access code do not have to be entered.
Example: Enter "914" instead of "00914"
- If no channel number is entered, channel 1 is opened automatically.
Example: Enter 00914 → **Assign process variable** parameter (0914)
- If a different channel is opened: Enter the direct access code with the corresponding channel number.
Example: Enter 00914-2 → **Assign process variable** parameter (0914)

Locking status

Navigation

  Expert → Locking status (0004)

Description

Displays the active write protection.

User interface

- Hardware locked
- SIL locked
- Temporarily locked

Additional information

Display

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

 Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device →  7

Options

Options	Description
None	The access authorization displayed in the Access status parameter (0005) (→  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).
SIL locked (priority 2)	The SIL mode is enabled. This locks write access to the parameters (e.g. via local display or operating tool).
Temporarily 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.

User role

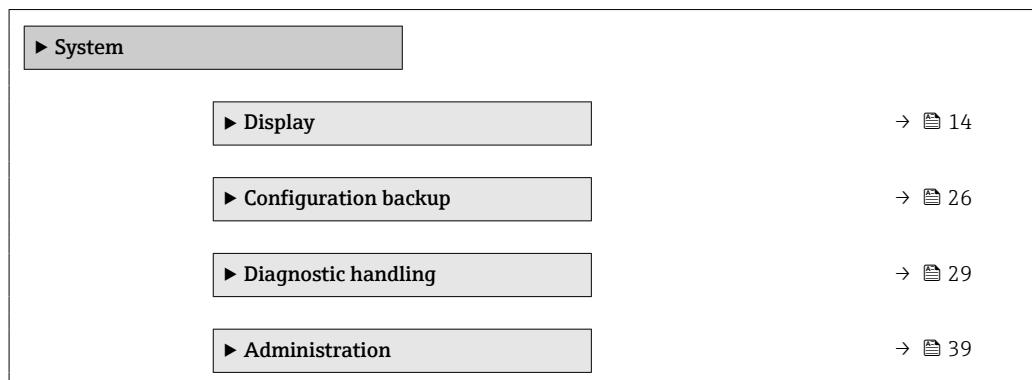
Navigation	 Expert → User role (0005)
Description	Displays the access authorization to the parameters via the local display, Web browser or operating tool.
User interface	<ul style="list-style-type: none"> ▪ Maintenance ▪ Service
Factory setting	Maintenance
Additional information	<p><i>Description</i></p> <p> Access authorization can be modified via the Enter access code parameter (0003) (→ 13).</p> <p> If additional write protection is active, this restricts the current access authorization even further.</p> <p><i>User interface</i></p> <p> Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device → 7</p>

Enter access code

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

3.1 "System" submenu

Navigation  Expert → System



3.1.1 "Display" submenu

Navigation

Expert → System → Display

► Display	
Display language (0104)	→ 15
Format display (0098)	→ 15
Value 1 display (0107)	→ 17
0% bargraph value 1 (0123)	→ 18
100% bargraph value 1 (0125)	→ 18
Decimal places 1 (0095)	→ 18
Value 2 display (0108)	→ 19
Decimal places 2 (0117)	→ 19
Value 3 display (0110)	→ 20
0% bargraph value 3 (0124)	→ 20
100% bargraph value 3 (0126)	→ 21
Decimal places 3 (0118)	→ 21
Value 4 display (0109)	→ 22
Decimal places 4 (0119)	→ 22
Display interval (0096)	→ 23
Display damping (0094)	→ 23
Header (0097)	→ 24
Header text (0112)	→ 24
Separator (0101)	→ 25
Contrast display (0105)	→ 25
Backlight (0111)	→ 25

Display language

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

Prerequisite A local display is provided.

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

Selection

- English
- Deutsch
- Français
- Español
- Italiano
- Nederlands
- Portuguesa
- Polski
- русский язык (Russian)
- Svenska
- Türkçe
- 中文 (Chinese)
- 日本語 (Japanese)
- 한국어 (Korean)
- tiếng Việt (Vietnamese)
- 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. size
- 1 bargraph + 1 value
- 2 values
- 1 value large + 2 values
- 4 values

Factory setting 1 value, max. size

Additional information *Description*

The display format (size, bar graph etc.) and number of measured values displayed simultaneously (1 to 8) can be configured. This setting only applies to normal operation.

-  ■ The **Value 1 display** parameter (0107) (→  17)...**Value 8 display** parameter (0148) 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 using the **Display interval** parameter (0096) (→  23).

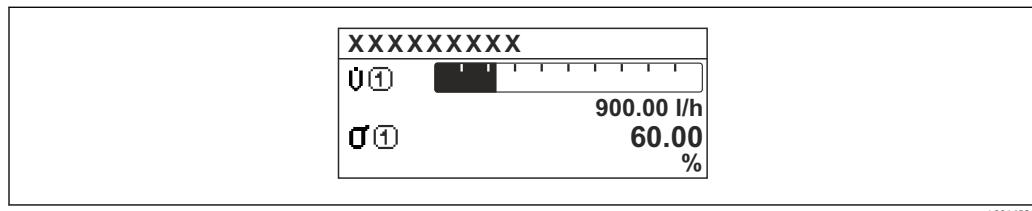
Possible measured values shown on the local display:

"1 value, max. size" option



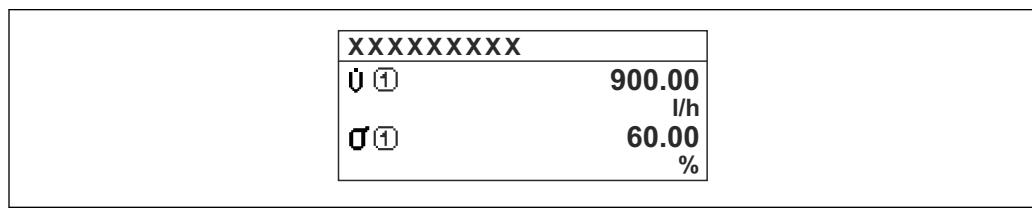
A0016529

"1 bargraph + 1 value" option



A0016530

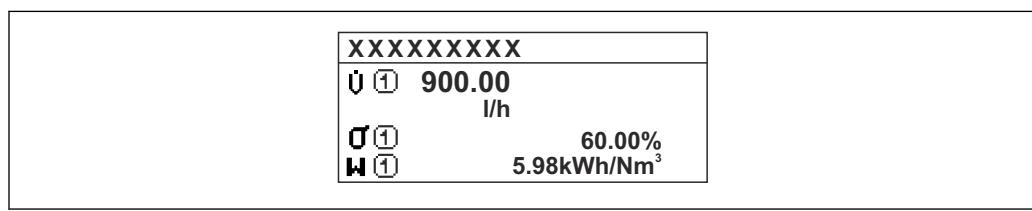
"2 values" option



A0016531

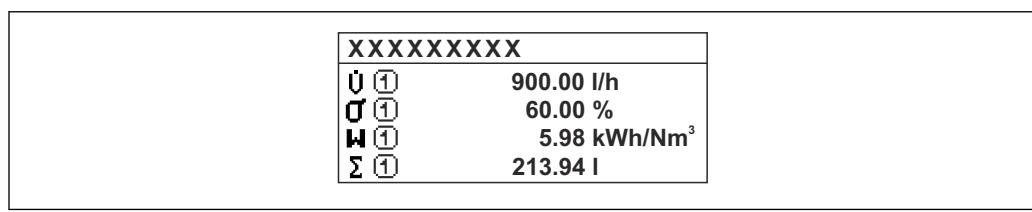
2

"1 value large + 2 values" option



A0016532

"4 values" option



A0016533

Value 1 display

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

Prerequisite A local display is provided.

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

- Selection**
- Mass flow
 - Flow velocity
 - Sound velocity
 - Volume flow
 - Corrected volume flow
 - Density
 - Dynamic viscosity *
 - Calorific value *
 - Wobbe index *
 - Energy flow
 - Signal strength *
 - Signal to noise ratio *
 - Acceptance rate *
 - Turbulence *
 - Flow asymmetry *
 - Electronics temperature *
 - Temperature *
 - Pressure *
 - Methane fraction *
 - Molar mass *
 - Totalizer 1
 - Totalizer 2
 - Totalizer 3
 - Current output 1 *
 - Current output 2 *
 - Current output 3 *
 - Current output 4 *

Factory setting Volume flow

Additional information *Description*

If there are several measured values one below the other, this appears in the first position. The value is only displayed during normal operation.

The **Format display** parameter (0098) (→ 15) is used to specify how many measured values are displayed simultaneously and how.

Dependency

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

* Visibility depends on order options or device settings

0% bargraph value 1



Navigation

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

Prerequisite

A local display is provided.

Description

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

User entry

Signed floating-point number

Factory setting

Country-specific

Additional information

Description

The **Format display** parameter (0098) (→ 15) is used to specify that the measured value is to be displayed as a bar graph.

User entry

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

100% bargraph value 1



Navigation

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

Prerequisite

A local display is provided.

Description

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

User entry

Signed floating-point number

Factory setting

Depends on country and nominal diameter → 251

Additional information

Description

The **Format display** parameter (0098) (→ 15) is used to specify that the measured value is to be displayed as a bar graph.

User entry

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

Decimal places 1



Navigation

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

Prerequisite

A measured value is specified in the **Value 1 display** parameter (0107) (→ 17).

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 accuracy of the device for measuring or calculating the value.

Value 2 display



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

Prerequisite A local display is provided.

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

Selection For the picklist, see **Value 1 display** parameter (0107) (→  17)

Factory setting None

Additional information *Description*

If there are several measured values one below the other, this appears in the second position. The value is only displayed during normal operation.

 The **Format display** parameter (0098) (→  15) is used to specify how many measured values are displayed simultaneously and how.

Dependency

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

Decimal places 2



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

Prerequisite A measured value is specified in the **Value 2 display** parameter (0108) (→  19).

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 accuracy of the device for measuring or calculating the value.

Value 3 display**Navigation**  Expert → System → Display → Value 3 display (0110)**Prerequisite**

A local display is provided.

Description

Use this function to select a measured value that is shown on the local display.

SelectionFor the picklist, see **Value 1 display** parameter (0107) (→  17)**Factory setting**

None

Additional information*Description*

If several measured values are displayed one below the other, 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 (0098) (→  15) is used to specify how many measured values are displayed simultaneously and how.

Options

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

0% bargraph value 3**Navigation**  Expert → System → Display → 0% bargraph 3 (0124)**Prerequisite**A selection was made in the **Value 3 display** parameter (0110) (→  20).**Description**

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

User entry

Signed floating-point number

Factory setting

Country-specific

Additional information*Description*

 The **Format display** parameter (0098) (→ 15) is used to specify that the measured value is to be displayed as a bar graph.

User entry

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

100% bargraph value 3**Navigation**

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

Prerequisite

A selection was made in the **Value 3 display** parameter (0110) (→ 20).

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 (0098) (→ 15) is used to specify that the measured value is to be displayed as a bar graph.

User entry

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

Decimal places 3**Navigation**

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

Prerequisite

A measured value is specified in the **Value 3 display** parameter (0110) (→ 20).

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 accuracy of the device for measuring or calculating the value.

Value 4 display

Navigation	Expert → System → Display → Value 4 display (0109)
Prerequisite	A local display is provided.
Description	Use this function to select a measured value that is shown on the local display.
Selection	For the picklist, see Value 1 display parameter (0107) (→ 17)
Factory setting	None
Additional information	<i>Description</i> If several measured values are displayed one below the other, 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 (0098) (→ 15) is used to specify how many measured values are displayed simultaneously and how. <i>Options</i> The unit of the displayed measured value is taken from the System units submenu (→ 61).

Decimal places 4

Navigation	Expert → System → Display → Decimal places 4 (0119)
Prerequisite	A measured value is specified in the Value 4 display parameter (0109) (→ 22).
Description	Use this function to select the number of decimal places for measured value 4.
Selection	<ul style="list-style-type: none"><input type="checkbox"/> X<input type="checkbox"/> X.X<input type="checkbox"/> X.XX<input type="checkbox"/> X.XXX<input type="checkbox"/> X.XXXX
Factory setting	X.XX
Additional information	<i>Description</i> This setting does not affect the accuracy of the device for measuring or calculating the value.

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	<p><i>Description</i></p> <p>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.</p> <p> ■ The Value 1 display parameter (0107) (→  17)...Value 8 display parameter (0148) are used to specify which measured values are shown on the local display.</p> <p>■ The display format for the measured values displayed is defined in the Format display parameter (0098) (→  15).</p>

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	<p><i>User entry</i></p> <p>Use this function to enter a time constant (PT1 element¹⁾) for display damping:</p> <ul style="list-style-type: none"> ■ At a low time constant, the display reacts quickly to fluctuating measured variables. ■ If a high time constant is entered, the display reacts more slowly. <p> The damping is not active if the value 0 (factory setting) is entered.</p>

1) proportional transmission behavior with first order delay

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

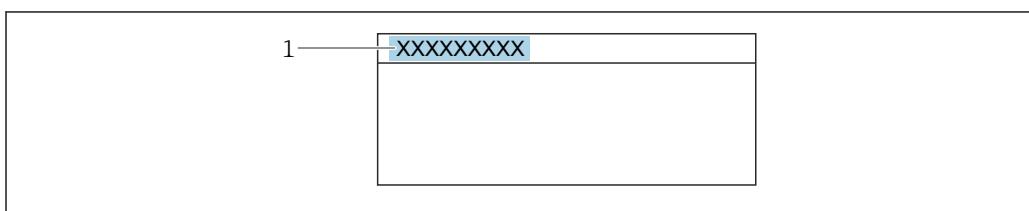
- Device tag
- Free text

Factory setting

Device tag

Additional information*Description*

The header text only appears during normal operation.



A0029422

1 Position of the header text on the display

Selection

- Device tag
 - Is defined in the **Device tag** parameter (0011) (→ 212).
- Free text
 - Is defined in the **Header text** parameter (0112) (→ 24).

Header text**Navigation**

Expert → System → Display → Header text (0112)

Prerequisite

The **Free text** option is selected in the **Header** parameter (0097) (→ 24).

Description

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

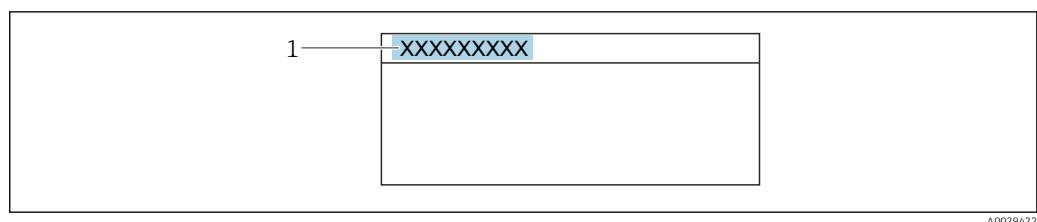
User entry

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

Factory setting

Additional information*Description*

The header text only appears during normal operation.



A0029422

1 Position of the header text on the display

User entry

The number of characters displayed depends on the characters used.

Separator



Navigation

Expert → System → Display → Separator (0101)

Prerequisite

A local display is provided.

Description

Use this function to select the decimal separator.

Selection

- . (point)
- , (comma)

Factory setting

. (point)

Contrast display

Navigation

Expert → System → Display → Contrast display (0105)

Prerequisite

A local display is provided.

Description

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

User entry

20 to 80 %

Factory setting

Depends on the display

Backlight

Navigation

Expert → System → Display → Backlight (0111)

Prerequisite

One of the following conditions is met:

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

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

Selection

- Disable
- Enable

Factory setting Enable

3.1.2 "Configuration backup" submenu

Navigation  Expert → System → Config. backup

 Configuration backup	
Operating time (0652)	→  26
Last backup (2757)	→  26
Configuration management (2758)	→  27
Backup state (2759)	→  27
Comparison result (2760)	→  28

Operating time

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

Description Displays the length of time the device has been in operation.

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

Additional information *Indication*

Maximum number of days: 9 999 (corresponds to approx. 27 years and 5 months)

Last backup

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

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

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

Configuration management

Navigation	Expert → System → Config. backup → Config. managem. (2758)
Description	Use this function to select an action to save the data to the device memory.
Selection	<ul style="list-style-type: none"> ■ Cancel ■ Execute backup ■ Restore * ■ Compare * ■ Clear backup data
Factory setting	Cancel
Additional information	<i>Selection</i>

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 Comparison result parameter (0103).
Clear backup data	The backup copy of the device configuration is deleted from the memory of the device. The following message appears on local display: Deleting file

HistoROM

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

Backup state

Navigation	Expert → System → Config. backup → Backup state (2759)
Description	Displays the status of the data backup process.
User interface	<ul style="list-style-type: none"> ■ None ■ Backup in progress ■ Restoring in progress ■ Delete in progress

* Visibility depends on order options or device settings

- Compare in progress
- Restoring failed
- Backup failed

Factory setting None

Comparison result

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

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

User interface

- Settings identical
- Settings not identical
- No backup available
- Backup settings corrupt
- Check not done
- Dataset incompatible

Factory setting Check not done

Additional information *Description*

 The comparison is started via the **Compare** option in the **Configuration management** parameter (2758) (→  27).

Options

Options	Description
Settings identical	The current device configuration of the HistoROM is not identical to the backup copy in the device memory. If the transformer configuration of another device has been transmitted to the device via HistoROM in Configuration management parameter (0100), the current device configuration of the HistoROM is only partially identical to the backup copy in the device memory: The settings for the transmitter are not identical.
Settings not identical	The current device configuration of the HistoROM is not identical to the backup copy in the device memory.
No backup available	There is no backup copy of the device configuration of the HistoROM in the device memory.
Backup settings corrupt	The current device configuration of the HistoROM is corrupt or not compatible with the backup copy in the device memory.
Check not done	The device configuration of the HistoROM has not yet been compared to the backup copy in the device memory.
Dataset incompatible	The backup copy in the device memory is not compatible with the device.

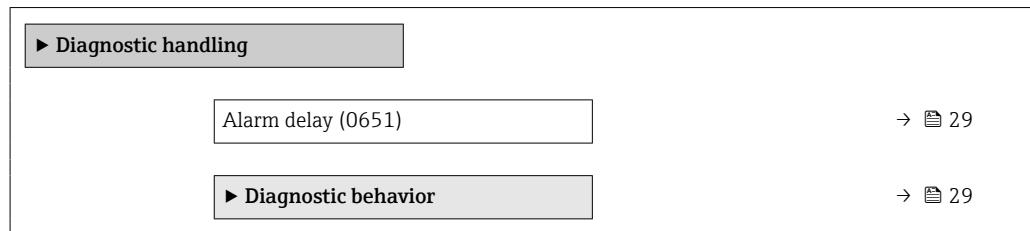
HistoROM

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

3.1.3 "Diagnostic handling" submenu

Navigation

Expert → System → Diagn. handling



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

Effect

This setting affects the following diagnostic messages:

- △S452 Calculation error detected
- 832 Electronics temperature too high
- 833 Electronics temperature too low
- 834 Process temperature too high
- 835 Process temperature too low
- ✗S836 Process pressure above limit
- △S837 Process pressure below limit
- △S841 Flow velocity too high
- △S870 Measuring inaccuracy increased
- △S930 Sound velocity too high
- △S931 Sound velocity too low

"Diagnostic behavior" submenu

Each item of diagnostic information is assigned a specific diagnostic behavior at the factory. The user can change this assignment for specific diagnostic information in the **Diagnostic behavior** submenu (→ 29).

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

Options	Description
Alarm	The device stops measurement. The signal outputs and totalizers assume the defined alarm condition. A diagnostic message is generated. The background lighting changes to red.
Warning	The device continues to measure. The signal outputs and totalizers are not affected. A diagnostic message is generated.
Logbook entry only	The device continues to measure. The diagnostic message is only displayed in the Event logbook submenu (→ 209) (Event list submenu (→ 210)) and is not displayed in alternating sequence 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

► **Diagnostic behavior**

Assign behavior of diagnostic no. 019 (0635)	→ 31
Assign behavior of diagnostic no. 160 (0776)	→ 31
Assign behavior of diagnostic no. 441 (0657)	→ 32
Assign behavior of diagnostic no. 442 (0658)	→ 32
Assign behavior of diagnostic no. 443 (0659)	→ 33
Assign behavior of diagnostic no. 444 (0740)	→ 33
Assign behavior of diagnostic no. 452 (0713)	→ 33
Assign behavior of diagnostic no. 543 (0643)	→ 34
Assign behavior of diagnostic no. 832 (0675)	→ 34
Assign behavior of diagnostic no. 833 (0676)	→ 35
Assign behavior of diagnostic no. 834 (0677)	→ 35

Assign behavior of diagnostic no. 835 (0678)	→ 35
Assign behavior of diagnostic no. 837 (0714)	→ 36
Assign behavior of diagnostic no. 841 (0680)	→ 36
Assign behavior of diagnostic no. 842 (0638)	→ 36
Assign behavior of diagnostic no. 930 (0639)	→ 38
Assign behavior of diagnostic no. 931 (0640)	→ 38
Assign behavior of diagnostic no. 870 (0726)	→ 37
Assign behavior of diagnostic no. 954 (0637)	→ 39

Assign behavior of diagnostic no. 019 (Device initialization active)**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 019 (0635)

Description

Use this function to change the diagnostic behavior of the **△S019 Device initialization active** diagnostic message.

Selection

- Off
- Alarm
- Warning
- Logbook entry only

Factory setting

Warning

Additional information

For a detailed description of the options available: → 30

Assign behavior of diagnostic no. 160 (Signal path switched off)**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 160 (0776)

Description

Use this function to change the diagnostic behavior of the **160 Signal path switched off** diagnostic message.

Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	 For a detailed description of the options available: → 30

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



Navigation	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 441 (0657)
Description	Use this function to change the diagnostic behavior of the 441 Current output 1 to n diagnostic message.
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	<i>Selection</i>  For a detailed description of the options available: → 30

Assign behavior of diagnostic no. 442 (Frequency output 1 to n)



Navigation	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 442 (0658)
Prerequisite	The measuring device has a pulse/frequency/switch output.
Description	Use this function to change the diagnostic behavior of the 442 Frequency output 1 to n diagnostic message.
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	 For a detailed description of the options available: → 30

Assign behavior of 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	Use this function to change the diagnostic behavior of the 443 Pulse output diagnostic message.
Selection	<ul style="list-style-type: none">■ Off■ Alarm■ Warning■ Logbook entry only
Factory setting	Warning
Additional information	<i>Selection</i> For a detailed description of the options available: → 30

Assign behavior of diagnostic no. 444 (Current input 1 to n)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 444 (0740)
Prerequisite	The device has one current input.
Description	Use this function to change the diagnostic behavior of the 444 Current input 1 to n diagnostic message.
Selection	<ul style="list-style-type: none">■ Off■ Alarm■ Warning■ Logbook entry only
Factory setting	Warning
Additional information	For a detailed description of the options available: → 30

Assign behavior of diagnostic no. 452 (Calculation error)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 452 (0713)
Description	Use this function to change the diagnostic behavior of the 452 Calculation error diagnostic message.

Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	 For a detailed description of the options available: → 30

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



Navigation	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 543 (0643)
Description	Use this function to change the diagnostic behavior of the 543 Double pulse output diagnostic message.
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	 For a detailed description of the options available: → 30

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



Navigation	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 832 (0675)
Description	Use this function to change the diagnostic behavior of the 832 Electronics temperature too high diagnostic message.
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	 For a detailed description of the options available: → 30

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



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 833 (0676)
Description	Use this function to change the diagnostic behavior of the 833 Electronics temperature too low diagnostic message.
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	<i>Selection</i> For a detailed description of the options available: → 30

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



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 834 (0677)
Description	Use this function to change the diagnostic behavior of the 834 Process temperature too high diagnostic message.
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	<i>Selection</i> For a detailed description of the options available: → 30

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



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 835 (0678)
Description	Use this function to change the diagnostic behavior of the 835 Process temperature too low diagnostic message.
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning

Additional information*Selection*For a detailed description of the options available: → [30](#)

Assign behavior of diagnostic no. 837 (Process pressure)

**Navigation**

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

DescriptionUse this function to change the diagnostic behavior of the **837 Process pressure** diagnostic message.**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

Factory setting

Warning

Additional informationFor a detailed description of the options available: → [30](#)

Assign behavior of diagnostic no. 841

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 841 (0680)

DescriptionUse this function to change the diagnostic behavior of the **△S841 Flow velocity too high** diagnostic message.**Selection**

- Off
- Alarm
- Warning
- Logbook entry only

Factory setting

Warning

Additional informationFor a detailed description of the options available: → [30](#)

Assign behavior of diagnostic no. 842 (Process limit)

**Navigation**

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

DescriptionUse this function to change the diagnostic behavior of the **842 Process limit** diagnostic message.

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

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

Additional information	 For a detailed description of the options available: → 30
-------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------

Assign behavior of diagnostic no. 870 (Measuring inaccuracy increased)



Navigation	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 870 (0726)
-------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------

Description	Use this function to change the diagnostic behavior of the 870 Measuring inaccuracy increased diagnostic message.
--------------------	--------------------------------------------------------------------------------------------------------------------------

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

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

Additional information	<i>Selection</i>
-------------------------------	------------------



For a detailed description of the options available: → [30](#)

Assign behavior of diagnostic no. 881 (Sensor signal path 1 to n)



Navigation	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 881 (0724)
-------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------

Description	Use this function to change the diagnostic behavior of the 881 Sensor signal path 1 to n diagnostic message.
--------------------	---------------------------------------------------------------------------------------------------------------------

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

Factory setting	Alarm
------------------------	-------

Additional information	 For a detailed description of the options available: → 30
-------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------

Assign behavior of diagnostic no. 930 (Process fluid)**Navigation**

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

Description

Use this function to change the diagnostic behavior of the **△S930 Process fluid** diagnostic message.

Selection

- Off
- Alarm
- Warning
- Logbook entry only

Factory setting

Alarm

Additional information

For a detailed description of the options available: → 30

Assign behavior of diagnostic no. 931 (Process fluid)**Navigation**

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

Description

Use this function to change the diagnostic behavior of the **△S931 Process fluid** diagnostic message.

Selection

- Off
- Alarm
- Warning
- Logbook entry only

Factory setting

Alarm

Additional information

For a detailed description of the options available: → 30

Assign behavior of diagnostic no. 953 (Asymmetry noise signal too high path 1 to n)**Navigation**

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

Description

Use this function to change the diagnostic behavior of the **△M953 Asymmetry noise signal too high path 1 to n** diagnostic message.

Selection

- Off
- Alarm
- Warning
- Logbook entry only

Factory setting

Alarm

Additional information

For a detailed description of the options available: → 30

Assign behavior of diagnostic no. 954 (Sound velocity deviation too high)**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 954 (0637)

Description

Use this function to change the diagnostic behavior of the **△S954 Sound velocity deviation too high** diagnostic message.

Selection

- Off
- Alarm
- Warning
- Logbook entry only

Factory setting

Warning

Additional information

For a detailed description of the options available: → [30](#)

3.1.4 "Administration" submenu*Navigation*

Expert → System → Administration

▶ Administration	
▶ Define access code	→ 39
▶ Reset access code	→ 41
Device reset (0000)	→ 42
Transmitter identifier (2765)	→ 42
Activate SW option (0029)	→ 43
Software option overview (0015)	→ 43

"Define access code" wizard

The **Define access code** wizard (→ [39](#)) is only available when operating via the local display or Web browser.

If operating via the operating tool, the **Define access code** parameter (0093) can be found directly in the **Administration** submenu. There is no **Confirm access code** parameter if the device is operated via the operating tool.

Navigation

Expert → System → Administration → Def. access code

▶ Define access code

Define access code	→ 40
Confirm access code	→ 40

Define access code



Navigation

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

Description

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

User entry

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

Additional information

Description

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

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

i Once the access code has been defined, write-protected parameters can only be modified if the access code is entered in the **Enter access code** parameter (0003) (→ 13).

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

User entry

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

Factory setting

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

Confirm access code



Navigation

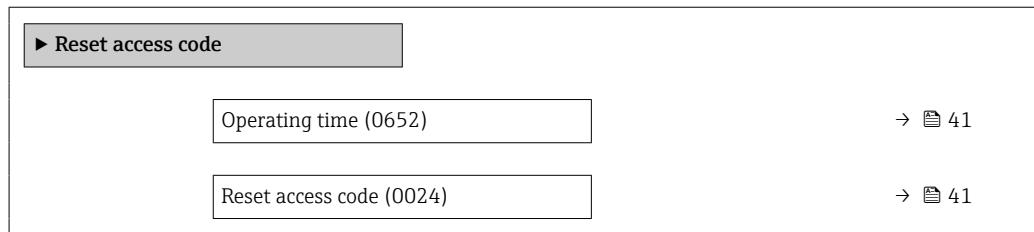
Expert → System → Administration → Def. access code → Confirm code

Description

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

User entry

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

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

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

Displays the length of time the device has been in operation.

User interface

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

Additional information*Indication*

Maximum number of days: 9 999 (corresponds to approx. 27 years and 5 months)

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

Use this function to enter a reset code to reset the user-specific access codes 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 CDI RJ45 interface)
- Fieldbus

Additional parameters in the "Administration" submenu

Device reset


Navigation

Expert → System → Administration → Device reset (0000)

Description

Reset the device configuration - either entirely or in part - to a defined state.

Selection

- Cancel
- To delivery settings
- Restart device
- Restore S-DAT backup *

Factory setting

Cancel

Additional information

Selection

Options	Description
Cancel	No action is executed and the user exits the parameter.
To delivery settings	Every parameter for which a customer-specific default setting was ordered is reset to the customer-specific value. All other parameters are reset to the factory setting.
Restart device	The restart resets every parameter with data stored in volatile memory (RAM) to the factory setting (e.g. measured value data). The device configuration remains unchanged.
Restore S-DAT backup	Restores the data that is saved on the S-DAT. Additional information: This function can be used to resolve the memory issue "083 Memory content inconsistent" or to restore the S-DAT data when a new S-DAT has been installed. This option is displayed only in an alarm condition.

Transmitter identifier


Navigation

Expert → System → Administration → Transm. identif. (2765)

Description

Select transmitter identifier.

User interface

- Unknown
- 500
- 300

Factory setting

500

* Visibility depends on order options or device settings

Activate SW option

Navigation	Expert → System → Administration → Activate SW opt. (0029)
Description	Use this function to enter an activation code to enable an additional, ordered software option.
User entry	Max. 10-digit string of numbers.
Factory setting	Depends on the software option ordered
Additional information	<p><i>Description</i></p> <p>If a measuring device was ordered with an additional software option, the activation code is programmed in the device at the factory.</p> <p> To activate a software option subsequently, please contact your Endress+Hauser sales organization.</p> <p><i>Entering the activation code</i></p> <p> The activation code is linked to the serial number of the measuring device and varies according to the device and software option.</p> <p>If an incorrect or invalid code is entered, this results in the loss of software options that have already been activated.</p> <ul style="list-style-type: none"> ▶ Before you enter a new activation code, make a note of the current activation code . ▶ Enter the new activation code provided by Endress+Hauser when the new software option was ordered. ▶ Once the activation code has been entered, check if the new software option is displayed in the Software option overview parameter (0015) (→ 43). <ul style="list-style-type: none"> ↳ 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. <p><i>Example for a software option</i></p> <p>Order code for "Application package", option EA "Extended HistoROM"</p> <p> The software options currently enabled are displayed in the Software option overview parameter (0015) (→ 43).</p> <p><i>Web browser</i></p> <p> Once a software option has been activated, the page must be loaded again in the Web browser.</p>

Software option overview

Navigation	Expert → System → Administration → SW option overv. (0015)
Description	Displays all the software options that are enabled in the device.

User interface

- Extended HistoROM
- SIL
- Advanced gas analysis *
- Heartbeat Monitoring
- Heartbeat Verification

Additional information*Description*

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

"Extended HistoROM" option

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

"SIL" option

Order code for "Additional approval", option LA "SIL"

"Heartbeat Verification" option and "Heartbeat Monitoring" option

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

"Advanced gas analysis" option

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

3.2 "Sensor" submenu

Navigation

Expert → Sensor

► Sensor	
► Measured values	→ 45
► System units	→ 61
► Process parameters	→ 72
► Measurement mode	→ 76
► External compensation	→ 85
► Sensor adjustment	→ 88
► Calibration	→ 99

* Visibility depends on order options or device settings

3.2.1 "Measured values" submenu

Navigation

Expert → Sensor → Measured val.

► Measured values	
► Process variables	→ 45
► System values	→ 50
► Totalizer	→ 52
► Input values	→ 55
► Output values	→ 56

"Process variables" submenu

Navigation

Expert → Sensor → Measured val. → Process variab.

► Process variables	
Volume flow (1838)	→ 46
Corrected volume flow (1857)	→ 46
Mass flow (1847)	→ 46
Flow velocity (1852)	→ 47
Sound velocity (1850)	→ 47
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Pressure (1872)	→ 48
Methane fraction (1863)	→ 48
Molar mass (1864)	→ 48
Density (1865)	→ 49
Dynamic viscosity (1887)	→ 49
Calorific value (1893)	→ 49

Wobbe index (1854)	→ 50
Energy flow (1851)	→ 50

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	<i>Dependency</i>
	 The unit is taken from the Volume flow unit parameter (0553) (→ 62)

Corrected volume flow

Navigation	  Expert → Sensor → Measured val. → Process variab. → CorrecVolumeFlow (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 Corrected volume flow unit parameter (0558) (→ 64)

Mass flow

Navigation	  Expert → Sensor → Measured val. → Process variab. → Mass flow (1847)
Description	Displays the mass flow that is currently calculated.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>
	 The unit is taken from the Mass flow unit parameter (0554) (→ 66)

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
Additional information	<i>Dependency</i>  The unit is taken from the Velocity unit parameter (0566) (→  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 (0566) (→  67)

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 Software option overview parameter (0015) (→  43).
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 (0557) (→  67)

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 **Software option overview** parameter (0015) (→  43).

Description

Displays the pressure that is currently measured.

User interface

Signed floating-point number

Additional information

Dependency

 The unit is taken from the **Pressure unit** parameter (0564) (→  68)

Methane fraction

Navigation

  Expert → Sensor → Measured val. → Process variab. → Methane fraction (1863)

Prerequisite

For the following order code:

"Application package", option EF "Advanced gas analysis"

 The software options currently enabled are displayed in the **Software option overview** parameter (0015) (→  43).

Description

Displays the methane content in Mol% that is currently calculated

User interface

Signed floating-point number

Additional information

Dependency

 The unit is taken from the **Velocity unit** parameter (0566) (→  67)

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"

 The software options currently enabled are displayed in the **Software option overview** parameter (0015) (→  43).

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)
Description	Displays the density that is currently calculated. <i>Dependency</i> The unit is taken from: Density unit parameter (0555) (→  68)
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Density unit parameter (0555) (→  68)

Dynamic 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 Software option overview parameter (0015) (→  43).
Description	Displays the dynamic viscosity that is currently calculated.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Dynamic viscosity unit parameter (0577) (→  69).

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 Software option overview parameter (0015) (→  43).
Description	Displays the calorific value that is currently calculated.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Calorific value unit parameter (0552) (→  70)

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 **Software option overview** parameter (0015) (→  43).

Description Displays the Wobbe index that is currently calculated.

User interface Signed floating-point number

Additional information *Description*

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 **Calorific value unit** parameter (0552) (→  70)

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 *Dependency*

 The unit is taken from the **Energy flow unit** parameter (0565) (→  70)

"System values" submenu

Navigation   Expert → Sensor → Measured val. → System values

 **System values**

Signal strength (2914)	→ 51
Signal to noise ratio (2917)	→ 51
Acceptance rate (2912)	→ 51
Turbulence (2907)	→ 52

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	<p><i>Description</i></p> <p>A drop in the signal strength over time can be an indicator of deposit buildup on the transducer or high ultrasonic damping in the gas.</p>

Signal to noise ratio

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	<p><i>Description</i></p> <p>A low value or a drop in the signal to noise ratio over time is an indicator of poor signal quality.</p>

Acceptance rate

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

Turbulence

Navigation  Expert → Sensor → Measured val. → System values → Turbulence (2907)

Description Displays the current turbulence.

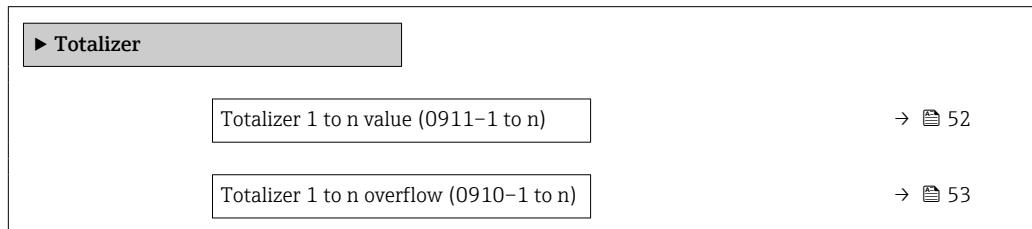
User interface Signed floating-point number

Additional information *Description*

A high turbulence value indicates a disturbance in the flow profile.

"Totalizer" submenu

Navigation  Expert → Sensor → Measured val. → Totalizer



Totalizer 1 to n value

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

Prerequisite One of the following options is selected in the **Assign process variable** parameter (0914) (→ [197](#)) of the **Totalizer 1 to n** submenu:

- Volume flow
- Corrected volume 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 **Totalizer overflow 1 to n** parameter (0910-1 to n) if the display range is exceeded.

-  In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (0901) (→ [201](#)).

Display

The value of the process variable aggregated since measuring began can be positive or negative. This depends on the settings in the **Totalizer operation mode** parameter (0908) (→ [199](#)).

-  The unit of the selected process variable is defined in the **Unit totalizer** parameter (0915) (→ [198](#)) for the totalizer.

Example

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

- Value in the **Totalizer value 1** parameter (0911): 1968 457 m³
- Value in the **Totalizer overflow 1** parameter (0910): $1 \cdot 10^7$ (1 overflow) = 10 000 000 m³
- Current totalizer value: 11 968 457 m³

Totalizer 1 to n overflow**Navigation**

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

Prerequisite

One of the following options is selected in the **Assign process variable** parameter (0914) (→ [197](#)) of the **Totalizer 1 to n** submenu:

- Volume flow
- Corrected volume 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 value 1 to n** parameter (0911-1 to n).

Display

 The unit of the selected process variable is defined in the **Unit totalizer** parameter (0915) (→ 198) for the totalizer.

Example

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

- Value in the **Totalizer value 1** parameter (0911): 1968457 m³
- Value in the **Totalizer overflow 1** parameter (0910): $2 \cdot 10^7$ (2 overflows) = 20 000 000 [m³]
- Current totalizer value: 21 968 457 m³

Totalizer 1 to n value

Navigation

 Expert → Sensor → Measured val. → Totalizer → Tot. 1 to n value

Description

Shows the totalizer value reported to the controller for further processing.

User interface

Signed floating-point number

Factory setting

0 m³

Totalizer 1 to n status

Navigation

 Expert → Sensor → Measured val. → Totalizer → Tot. 1 to n status

Description

Shows the status of the totalizer value reported to the controller for further processing ('Good', 'Uncertain', 'Bad').

User interface

- Good
- Uncertain
- Bad

Factory setting

Good

Totalizer 1 to n status (Hex)

Navigation

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

Description

Shows the status of the totalizer value reported to the controller for further processing (Hex).

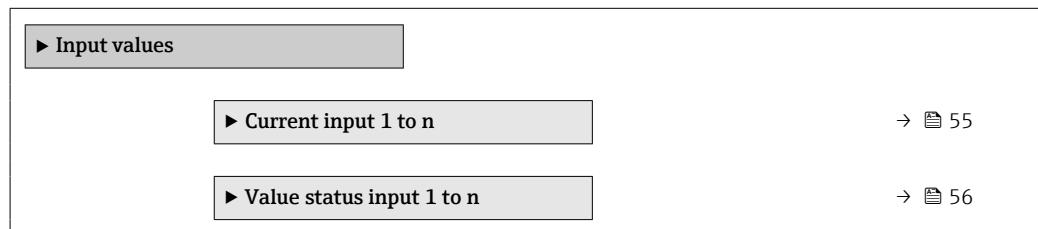
User interface

0 to 255

Factory setting 128

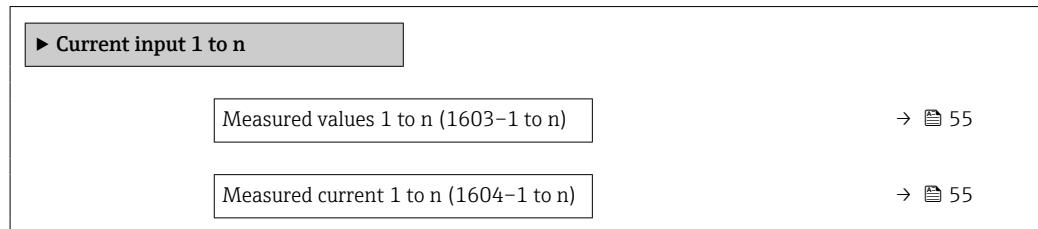
"Input values" submenu

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 values 1 to n

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

Description Displays the current input value.

User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Pressure unit** parameter (0564) (→ 68)

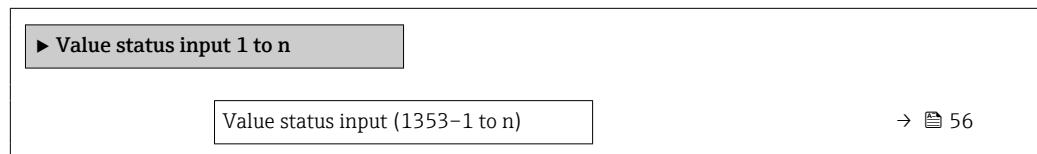
Measured current 1 to n

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

Description Displays the current value of the current input.

User interface

0 to 22.5 mA

*"Value status input 1 to n" submenu**Navigation* Expert → Sensor → Measured val. → Input values → Val.stat.inp.
1 to n

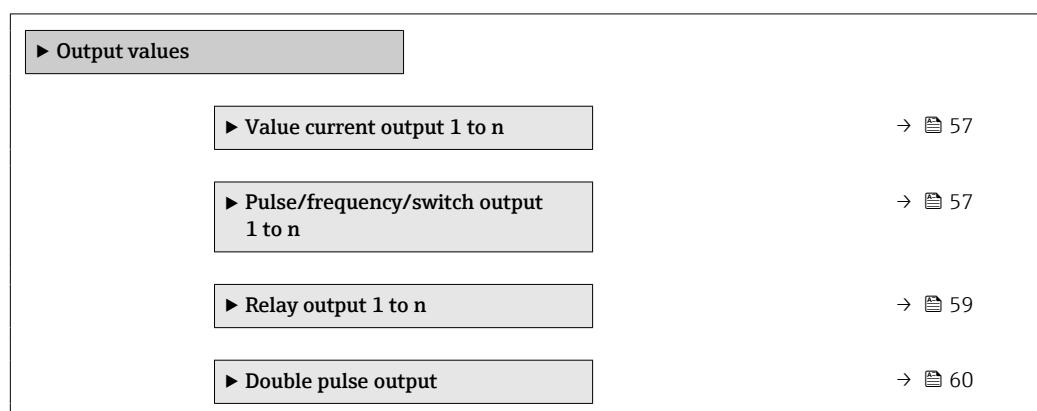
Value status input

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

Displays the current input signal level.

User interface

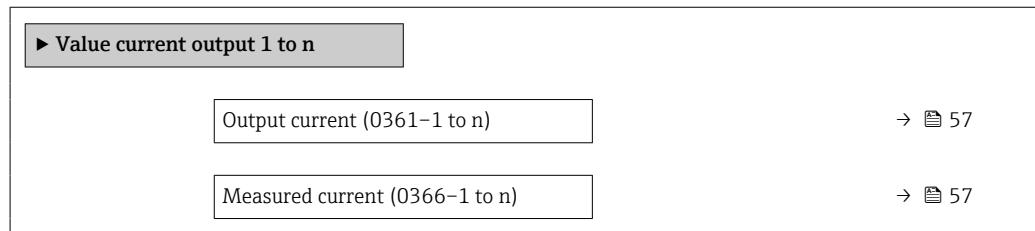
- High
- Low

*"Output values" submenu**Navigation* Expert → Sensor → Measured val. → Output values

"Value current output 1 to n" submenu

Navigation

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



Output current

Navigation

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

Description

Displays the current value currently calculated for the current output.

User interface

0 to 22.5 mA

Measured current

Navigation

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

Description

Displays the actual measured value of the output current.

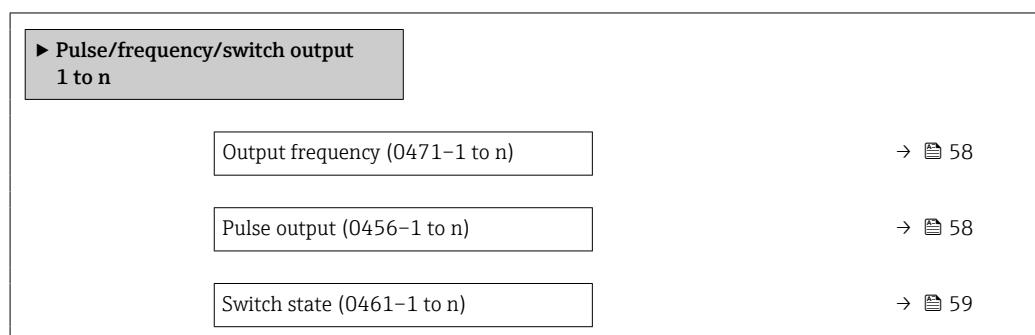
User interface

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 frequency

Navigation

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

Prerequisite

In the **Operating mode** parameter (0469) (→  123), 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

Navigation

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

Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (0469) (→  123) parameter.

Description

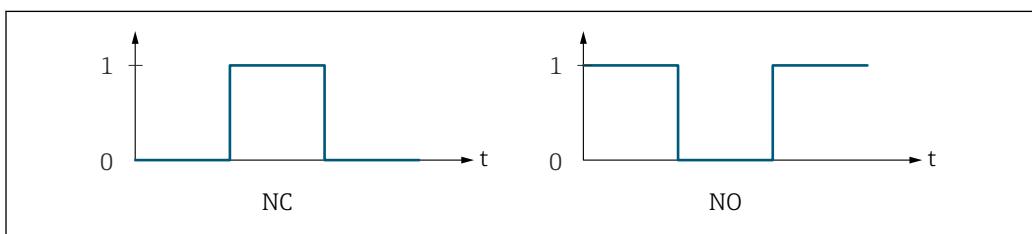
Displays the pulse frequency currently output.

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 output signal** parameter (0470) (→  141) i.e. the transistor does not conduct for the duration of the pulse.

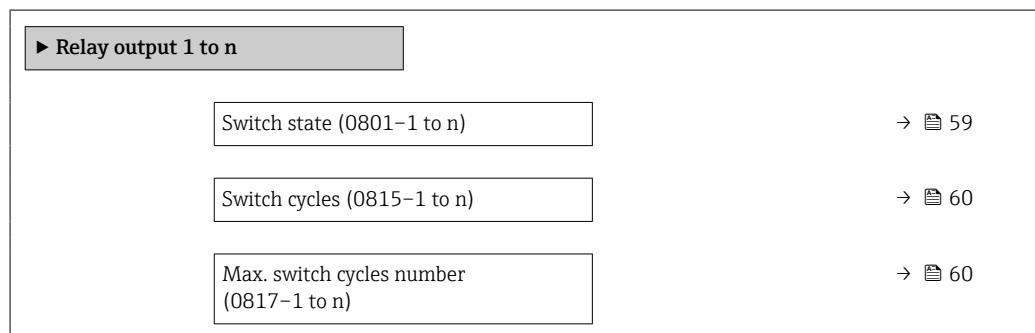
In addition, the behavior of the output in the event of a device alarm (**Failure mode** parameter (0480) (→  127)) can be configured.

Switch state

Navigation	 Expert → Sensor → Measured val. → Output values → PFS output 1 to n → Switch state (0461-1 to n)
Prerequisite	The Switch option is selected in the Operating mode parameter (0469) (→ 123).
Description	Displays the current switch status of the status output.
User interface	<ul style="list-style-type: none"> ▪ Open ▪ Closed
Additional information	<p><i>User interface</i></p> <ul style="list-style-type: none"> ▪ Open The switch output is not conductive. ▪ Closed The switch output is conductive.

"Relay output 1 to n" submenu

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



Switch state

Navigation	 Expert → Sensor → Measured val. → Output values → Relay output 1 to n → Switch state (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*User interface*

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

Switch cycles**Navigation**

  Expert → Sensor → Measured val. → Output values → Relay output 1 to n → Switch cycles (0815-1 to n)

Description

Displays all the switch cycles performed.

User interface

Positive integer

Max. switch cycles number**Navigation**

  Expert → Sensor → Measured val. → Output values → Relay output 1 to n → Max. cycles no. (0817-1 to n)

Description

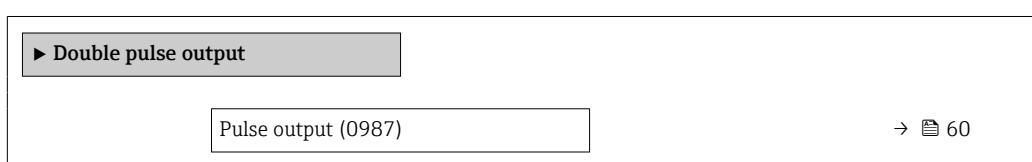
Displays the maximum number of guaranteed switch cycles.

User interface

Positive integer

*"Double pulse output" submenu**Navigation*

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

**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 (0456–1 to n)
(→ 58)

3.2.2 "System units" submenu

Navigation

Expert → Sensor → System units

► System units	
Volume flow unit (0553)	→ 62
Volume unit (0563)	→ 64
Corrected volume flow unit (0558)	→ 64
Corrected volume unit (0575)	→ 65
Mass flow unit (0554)	→ 66
Mass unit (0574)	→ 66
Velocity unit (0566)	→ 67
Temperature unit (0557)	→ 67
Pressure unit (0564)	→ 68
Density unit (0555)	→ 68
Energy unit (0559)	→ 69
Dynamic viscosity unit (0577)	→ 69
Calorific value unit (0552)	→ 70
Energy flow unit (0565)	→ 70
Specific heat capacity unit (0604)	→ 71
Date/time format (2812)	→ 71

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

- cm³/s
- cm³/min
- cm³/h
- cm³/d
- dm³/s
- dm³/min
- dm³/h
- dm³/d
- m³/s
- m³/min
- m³/h
- m³/d
- ml/s
- ml/min
- ml/h
- ml/d
- l/s
- l/min
- l/h
- l/d
- hl/s
- hl/min
- hl/h
- hl/d
- Ml/s
- Ml/min
- Ml/h
- Ml/d
- af/s
- af/min
- af/h
- af/d
- ft³/s
- ft³/min
- ft³/h
- ft³/d
- Mft³/s
- Mft³/min
- Mft³/h
- Mft³/d
- MMft³/s
- MMft³/min
- MMft³/h
- fl oz/s (us)
- fl oz/min (us)
- fl oz/h (us)
- fl oz/d (us)
- gal/s (us)
- gal/min (us)
- gal/h (us)
- gal/d (us)
- Mgal/s (us)

- Mgal/min (us)
- Mgal/h (us)
- Mgal/d (us)
- bbl/s (us;liq.)
- bbl/min (us;liq.)
- bbl/h (us;liq.)
- bbl/d (us;liq.)
- bbl/s (us;beer)
- bbl/min (us;beer)
- bbl/h (us;beer)
- bbl/d (us;beer)
- bbl/s (us;oil)
- bbl/min (us;oil)
- bbl/h (us;oil)
- bbl/d (us;oil)
- bbl/s (us;tank)
- bbl/min (us;tank)
- bbl/h (us;tank)
- bbl/d (us;tank)
- gal/s (imp)
- gal/min (imp)
- gal/h (imp)
- gal/d (imp)
- Mgal/s (imp)
- Mgal/min (imp)
- Mgal/h (imp)
- Mgal/d (imp)
- bbl/s (imp;beer)
- bbl/min (imp;beer)
- bbl/h (imp;beer)
- bbl/d (imp;beer)
- bbl/s (imp;oil)
- bbl/min (imp;oil)
- bbl/h (imp;oil)
- bbl/d (imp;oil)
- kgal/s (us)
- kgal/min (us)
- kgal/h (us)
- kgal/d (us)

Factory setting

Depends on country:

- m³/h
- ft³/h

Additional information*Effect*

The selected unit applies to:

Volume flow parameter (1838) (→  46)*Options*For an explanation of the abbreviated units: →  255*Customer-specific units*The unit for the customer-specific volume is specified in the **User volume text** parameter (0567).

Volume unit**Navigation**

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

Description

Use this function to select the unit for the volume.

Selection

- cm³
- dm³
- m³
- ml
- l
- hl
- Ml
- af
- ft³
- Mft³
- MMft³
- fl oz (us)
- gal (us)
- kgal (us)
- Mgal (us)
- bbl (us;oil)
- bbl (us;liq.)
- bbl (us;beer)
- bbl (us;tank)
- gal (imp)
- Mgal (imp)
- bbl (imp;beer)
- bbl (imp;oil)

Factory setting

Depends on country:

- m³
- ft³

Additional information

Options

For an explanation of the abbreviated units: → 255

Corrected volume flow unit**Navigation**

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

Description

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

Selection	<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
	■ NI/s	■ Sft ³ /s	■ Sgal/s (imp)
	■ NI/min	■ Sft ³ /min	■ Sgal/min (imp)
	■ NI/h	■ Sft ³ /h	■ Sgal/h (imp)
	■ NI/d	■ Sft ³ /d	■ Sgal/d (imp)
	■ Nhl/s	■ MSft ³ /s	
	■ Nhl/min	■ MSft ³ /min	
	■ Nhl/h	■ MSft ³ /h	
	■ Nhl/d	■ MSft ³ /D	
	■ Nm ³ /s	■ MMSft ³ /s	
	■ Nm ³ /min	■ MMSft ³ /min	
	■ Nm ³ /h	■ MMSft ³ /h	
	■ Nm ³ /d	■ MMSft ³ /d	
	■ Sl/s	■ Sgal/s (us)	
	■ Sl/min	■ Sgal/min (us)	
	■ Sl/h	■ Sgal/h (us)	
	■ Sl/d	■ Sgal/d (us)	
	■ Sm ³ /s	■ Sbbl/s (us;liq.)	
	■ Sm ³ /min	■ Sbbl/min (us;liq.)	
	■ Sm ³ /h	■ Sbbl/h (us;liq.)	
	■ Sm ³ /d	■ Sbbl/d (us;liq.)	
		■ Sbbl/s (us;oil)	
		■ Sbbl/min (us;oil)	
		■ Sbbl/h (us;oil)	
		■ Sbbl/d (us;oil)	

Factory setting Country-specific:

- Nm³/h
- Sft³/h

Additional information

Result

The selected unit applies for:

Corrected volume flow (1857) (→  46)

Selection

 For an explanation of the abbreviated units: →  255

Corrected volume unit



Navigation

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

Description

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

Selection

SI units

- NI
- Nhl
- Nm³
- Sl
- Sm³

US units

- Sft³
- MSft³
- MMSft³
- Sgal (us)
- Sbbl (us;liq.)
- Sbbl (us;oil)

Imperial units

- Sgal (imp)

Factory setting

Country-specific:

- Nm³
- Sft³

Additional information*Selection*For an explanation of the abbreviated units: → [255](#)**Mass flow unit****Navigation**

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

Description

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

Selection*SI units*

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

US units

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

Factory setting

Depends on country:

- kg/h
- lb/h

Additional information*Result*

The selected unit applies to:

Mass flow parameter (1872) (→ [48](#))*Selection*For an explanation of the abbreviated units: → [255](#)**Mass unit****Navigation**

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

Description

Use this function to select the unit for the mass.

Selection	<i>SI units</i>	<i>US units</i>
	■ g	■ oz
	■ kg	■ lb
	■ t	■ STon

Factory setting	Country-specific:
	■ kg
	■ lb

Additional information	<i>Selection</i>
	 For an explanation of the abbreviated units: → 255

Velocity unit



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

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

Selection	<i>SI units</i>	<i>US units</i>
	m/s	ft/s

Factory setting	Country-specific:
	■ m/s
	■ ft/s

Additional information	<i>Effect</i>
	The selected unit applies for:
	■ Flow velocity (1852) (→ 47)
	■ Sound velocity (1850) (→ 47)
	■ Maximum value (2968)
	■ Minimum value (2969)
	<i>Selection</i>
	 For an explanation of the abbreviated units: → 255

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*Effect*

The selected unit applies for:
Temperature (1853) (→ 47)

Selection

For an explanation of the abbreviated units: → 255

Pressure unit**Navigation**

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

Description

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

Selection*SI units*

- MPa
- kPa
- Pa
- bar

US units

- psi

Factory setting

Depends on country:

- bar
- psi

Additional information*Effect*

The unit is taken from:
Process pressure parameter (5640)

Options

For an explanation of the abbreviated units: → 255

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

- SG60°F
- 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/m ³ ■ lb/ft ³
------------------------	------------------------------------------------------------------

Additional information	<i>Selection</i>
	 For an explanation of the abbreviated units: → 255

Energy unit

Navigation	 Expert → Sensor → System units → Energy unit (0559)
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Description	Use this function to select the unit for energy.
--------------------	--------------------------------------------------

Selection	<i>SI units</i>	<i>Imperial units</i>
	■ kWh	■ Btu
	■ MWh	■ MBtu
	■ GWh	■ MMBtu
	■ kJ	
	■ MJ	
	■ GJ	
	■ kcal	
	■ Mcal	

Factory setting	Country-specific: ■ kWh ■ Btu
------------------------	-------------------------------------

Additional information	<i>Selection</i>
	 For an explanation of the abbreviated units: → 255

Dynamic viscosity unit

Navigation	 Expert → Sensor → System units → Dyn. visc. unit (0577)
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Description	Use this function to select the unit for dynamic viscosity.
--------------------	-------------------------------------------------------------

Selection	<i>SI units</i>
	■ cP
	■ µPa s
	■ mPa s
	■ Pa s
	■ P

Factory setting	Pa s
------------------------	------

Additional information	<i>Selection</i>
	 For an explanation of the abbreviated units: → 255

Calorific 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/m³
- kJ/m³

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 (1853) (→ 47)
- **Wobbe index** parameter (1854) (→ 50)

Selection

For an explanation of the abbreviated units: → 255

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: → [255](#)

Specific heat capacity unit**Navigation**

Expert → Sensor → System units → SpecHeatCapaUnit (0604)

Prerequisite

The following conditions are met:

Selected medium:

The **User-specific gas** option is selected in the **Select gas type** parameter (7635) 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:

Specific heat capacity parameter (7716)

Selection

For an explanation of the abbreviated units: → [255](#)

Date/time format**Navigation**

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

Description

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

Selection

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

Factory setting

dd.mm.yy hh:mm

Additional information*Selection*

For an explanation of the abbreviated units: → [255](#)

3.2.3 "Process parameters" submenu

Navigation

Expert → Sensor → Process param.

▶ Process parameters	
Flow override (1839)	→ 72
Flow damping (1802)	→ 72
Gas properties damping (1888)	→ 73
Temperature damping (1803)	→ 74
Pressure damping (1889)	→ 74
▶ Low flow cut off	
	→ 74

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

i The **Flow override** option can also be activated in the **Status input** submenu: **Assign status input** parameter (1352) (→ 106).

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).

Effect

 The damping affects the following variables of the device:

- Outputs → [107](#)
- Low flow cut off → [74](#)
- Totalizers → [197](#)

Gas properties damping



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

Description Use this function to enter the time constant for gas property 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 *Effect*

 The damping has an effect on the following outputs:

- Corrected volume flow (1857) (→ [46](#))
- Density (1865) (→ [49](#))
- Methane fraction (1863) (→ [48](#))
- Dynamic viscosity (1887) (→ [49](#))
- Calorific value (1893) (→ [49](#))
- Wobbe index (1854) (→ [50](#))
- Energy flow (1851) (→ [50](#))

2) Proportional behavior with first-order lag

Temperature 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

Use this function to enter the time constant for density damping.

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 process variable (1837)	→ 75
On value low flow cutoff (1805)	→ 75
Off value low flow cutoff (1804)	→ 75

3) Proportional behavior with first-order lag

Assign process variable

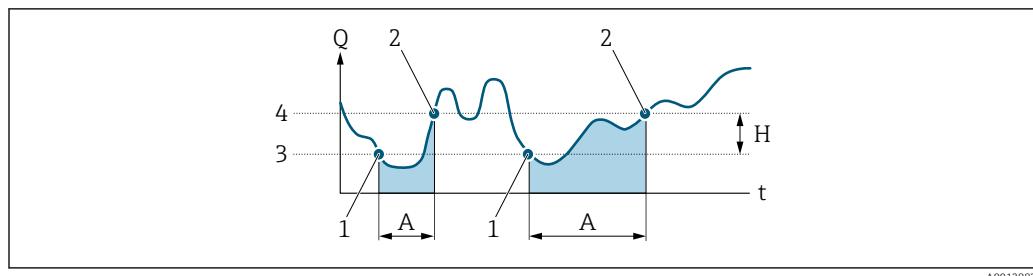
Navigation	Expert → Sensor → Process param. → Low flow cut off → Assign variable (1837)
Description	Use this function to select the process variable for low flow cutoff detection.
Selection	<ul style="list-style-type: none">▪ Off▪ Volume flow▪ Corrected volume flow▪ Mass flow▪ Flow velocity▪ Energy flow
Factory setting	Off

On value low flow cutoff

Navigation	Expert → Sensor → Process param. → Low flow cut off → On value (1805)
Prerequisite	A process variable is selected in the Assign process variable parameter (→ 75).
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 → 75 .
User entry	Positive floating-point number
Factory setting	Depends on country and nominal diameter → 252
Additional information	<i>Dependency</i> The unit depends on the process variable selected in the Assign process variable parameter (→ 75).

Off value low flow cutoff

Navigation	Expert → Sensor → Process param. → Low flow cut off → Off value (1804)
Prerequisite	A process variable is selected in the Assign process variable parameter (→ 75).
Description	Use this function to enter a switch-off value for low flow cut off. The switch-off value is entered as a positive hysteresis from the switch-on value → 75 .
User entry	0 to 100.0 %
Factory setting	50 %

Additional information*Example*

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

3.2.4 "Measurement mode" submenu

Navigation

Expert → Sensor → Measurement mode

► Measurement mode	
Select gas type (3109)	→ 76
Density calculation (3102)	→ 77
Calorific value calculation (3103)	→ 77
Reference conditions (3155)	→ 77
Reference pressure (3146)	→ 78
Reference temperature (3147)	→ 78
Reference combustion temperature (3165)	→ 78
► Medium properties	
	→ 79

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/biogas * ■ Natural gas - standardized calculation * ■ Natural gas - using sound velocity * ■ User-specific gas
------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Factory setting	User-specific gas
------------------------	-------------------

Density calculation



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

Calorific value calculation



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

Reference 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"> ■ 1013.25 hPa, 0 °C ■ 1013.25 hPa, 15 °C ■ 1013.25 hPa, 20 °C ■ 1013.25 hPa, 25 °C ■ 1000.00 hPa, 0 °C ■ 1000.00 hPa, 15 °C

* Visibility depends on order options or device settings

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

Factory setting 1013.25 hPa, 0 °C

Reference pressure



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

Prerequisite The **Other** option is selected in the **Reference conditions** parameter (3155) (→ 77).

Description Select reference conditions for the corrected volume flow.

User entry 0 to 250 bar

Factory setting 1.01325 bar

Reference temperature



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

Prerequisite The **Other** option is selected in the **Reference conditions** parameter (3155) (→ 77).

Description Select reference conditions for the corrected volume flow.

User entry -200 to 450 °C

Factory setting 0 °C

Reference combustion temperature



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 properties	
Calorific value type (3101)	→ 79
Humidity type (3156)	→ 80
Humidity type (3166)	→ 80
Reference density (3144)	→ 80
Reference gross calorific value (3145)	→ 81
Reference Z-factor (3148)	→ 81
Relative density (3149)	→ 81
Specific heat capacity (3162)	→ 81
Specific heat capacity (3163)	→ 82
Calorific value (3105)	→ 82
Z-factor (3108)	→ 82
Dynamic viscosity (3106)	→ 82
Additional gas component (3154)	→ 83
Standard volume flow calculation (3164)	→ 83
► Gas specification	
	→ 83

Calorific value 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

- Gross calorific value volume
- Net calorific value volume

Factory setting

Net calorific value volume

Humidity type



Navigation

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

Description

Select the input value for the gas humidity.

Selection

- Relative humidity
- Water fraction
- Dew point

Factory setting

Depends on the selected gas type.

Humidity type



Navigation

Expert → Sensor → Measurement mode → Medium property → Humidity type (3166)

Description

Select the input value for the gas humidity.

Selection

- Relative humidity
- Water fraction
- Dew point

Factory setting

Relative humidity

Reference 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

Reference gross calorific value



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/Nm ³
Factory setting	40 MJ/Nm ³

Reference 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

Specific heat capacity



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.

Specific heat capacity

Navigation Expert → Sensor → Measurement mode → Medium property → Spec. heat cap. (3163)

Description Enter the specific heat capacity of the medium.

User entry 0 to 50 000 J/(kgK)

Factory setting 2 200 J/(kgK)

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/Nm³

Factory setting 40 MJ/Nm³

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

Dynamic 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 1 000 µPa s

Factory setting 15 µPa s

Additional gas component

Navigation	Expert → Sensor → Measurement mode → Medium property → Add. gas compon. (3154)
Prerequisite	The Coal gas/biogas option is selected in the Select gas type parameter (3109) (→ 76).
Description	Specify the additional gas component of the gas.
Selection	<ul style="list-style-type: none"> ▪ None ▪ Hydrogen H₂ ▪ Hydrogen sulfide H₂S
Factory setting	None

Standard volume flow calculation

Navigation	Expert → Sensor → Measurement mode → Medium property → St.vol.fl. cal. (3164)
Prerequisite	The Coal gas/biogas option is selected in the Select gas type parameter (3109) (→ 76).
Description	Setting specifying how the corrected volume flow is calculated for wet coal gas/biogas.
Selection	<ul style="list-style-type: none"> ▪ Wet gas ▪ Dry gas
Factory setting	Dry gas

"Gas specification" submenu

For detailed information on the parameter descriptions of the **Extended gas analysis** application package, see the Special Documentation for the device → 7

Navigation Expert → Sensor → Measurement mode → Medium property → Gas specific.

► Gas specification
Gas (3151)
Gas composition (3110)
Mol% Air (3170)
Mol% Ar (3112)

Mol% C2H3Cl (3113)
Mol% C2H4 (3114)
Mol% C2H6 (3115)
Mol% C3H8 (3116)
Mol% CH4 (3117)
Mol% Cl2 (3118)
Mol% CO (3119)
Mol% CO2 (3120)
Mol% H2 (3121)
Mol% H2O (3122)
Mol% H2O (3168)
Mol% H2S (3123)
Mol% HCl (3124)
Mol% He (3125)
Mol% i-C4H10 (3126)
Mol% i-C5H12 (3127)
Mol% Kr (3128)
Mol% N2 (3129)
Mol% n-C10H22 (3130)
Mol% n-C4H10 (3131)
Mol% n-C5H12 (3132)
Mol% n-C6H14 (3133)
Mol% n-C7H16 (3134)
Mol% n-C8H18 (3135)
Mol% n-C9H20 (3136)

Mol% Ne (3137)
Mol% NH ₃ (3138)
Mol% O ₂ (3139)
Mol% other gas (3140)
Mol% SO ₂ (3141)
Mol% Xe (3142)
Relative humidity (3150)
Relative humidity (3169)
Dew point (3157)
Dew point (3167)

3.2.5 "External compensation" submenu

Navigation

Diagram Expert → Sensor → External comp.

► External compensation	
Pressure compensation (3023)	→ 86
Fixed value (3022)	→ 86
External pressure (3059)	→ 86
External pressure measurement (3033)	→ 87
Atmospheric pressure (3024)	→ 87
Temperature compensation (3025)	→ 87
Fixed value (2925)	→ 88
External value (3058)	→ 88

Pressure compensation

Navigation Expert → Sensor → External comp. → Pressure compen. (3023)

Description Select pressure compensation type.

- Selection**
- Fixed value
 - External value *
 - Internal measured value *
 - Current input 1 *
 - Current input 2 *
 - Current input 3 *

Factory setting Fixed value

Fixed value

Navigation Expert → Sensor → External comp. → Fixed value (3022)

Prerequisite The **Fixed value** option is selected in **Pressure compensation** parameter (3023) (→ 86).

Description Enter a fixed value for the process pressure.

The pressure is 0 bar(g) = 1.01325 bar under standard conditions.

User entry 0 to 250 bar

Factory setting 5 bar

External pressure

Navigation Expert → Sensor → External comp. → External press. (3059)

Prerequisite The **External value** option or the **Current input 1...n** option is selected in the **Pressure compensation** parameter (3023) (→ 86).

Description Shows the process pressure read from the external device.

User interface Positive floating-point number

Factory setting 0 bar

* Visibility depends on order options or device settings

External pressure measurement

Navigation Expert → Sensor → External comp. → Ext. press.meas. (3033)

Description Select pressure type for external pressure measurement.

Selection

- Absolute pressure
- Gauge pressure

Factory setting Absolute pressure

Atmospheric pressure

Navigation Expert → Sensor → External comp. → Atmosph. press. (3024)

Prerequisite The **External value** option or **Current input 1...3** option is selected in the **Pressure compensation** parameter (3023) (→ 86).

The **Gauge pressure** option is selected in the **External pressure measurement** parameter (3033) (→ 87).

Description Enter atmospheric pressure value to be used for pressure correction.

User entry 0.7 to 1.1 bar

Factory setting 1.01325 bar

Temperature compensation

Navigation Expert → Sensor → External comp. → Temp. compensat. (3025)

Prerequisite The **Calculated value** option is selected in the **Density source** parameter (3048).

Description Select temperature mode for temperature compensation.

Selection

- Fixed value
- Internal measured value *
- External value *
- Current input 1 *
- Current input 2 *
- Current input 3 *

Factory setting Fixed value

* Visibility depends on order options or device settings

Fixed value**Navigation**

Expert → Sensor → External comp. → Fixed value (2925)

Prerequisite

The **Fixed value** option is selected in **Temperature compensation** parameter (3025) (→ 87).

Description

Enter a fixed value for the process temperature.

User entry

-50 to 550 °C

Factory setting

20 °C

External value**Navigation**

Expert → Sensor → External comp. → External value (3058)

Prerequisite

The **External value** option or the **Current input 1...n** option is selected in the **Temperature compensation** parameter (3025) (→ 87).

Description

Shows the process temperature read from the external device.

User interface

-273.15 to 99 999 °C

Factory setting

0 °C

3.2.6 "Sensor adjustment" submenu

Navigation

Expert → Sensor → Sensor adjustm.

► Sensor adjustment	
Installation direction (1809)	→ 89
► Process variable adjustment	→ 90
Reference pressure (5670)	→ 89
Pressure cell adjustment (5669)	→ 89
Pressure cell offset value (5671)	→ 89

Installation direction**Navigation**

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

Description

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

Selection

- Forward flow
- Reverse flow

Factory setting

Forward flow

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.

Reference 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

Pressure cell adjustment**Navigation**

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

Description

Perform pressure cell adjustment or reset offset to 0.

Selection

- Yes
- Discard offset
- Cancel

Factory setting

Cancel

Pressure cell offset value**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

► Process variable adjustment	
Volume flow offset (1831)	→ 91
Volume flow factor (1832)	→ 91
Corrected volume flow offset (1855)	→ 92
Corrected volume flow factor (1856)	→ 92
Mass flow offset (1841)	→ 92
Mass flow factor (1846)	→ 93
Sound velocity offset (1848)	→ 93
Sound velocity factor (1849)	→ 93
Temperature offset (1870)	→ 94
Temperature factor (1871)	→ 94
Pressure offset (1881)	→ 94
Pressure factor (1882)	→ 95
Methane fraction offset (1873)	→ 95
Methane fraction factor (1874)	→ 95
Molar mass offset (1875)	→ 95
Mol mass factor (1876)	→ 96
Density offset (1877)	→ 96
Density factor (1878)	→ 96
Dynamic viscosity offset (1898)	→ 96

Dynamic viscosity factor (1897)	→ 97
Calorific value offset (1899)	→ 97
Calorific value factor (1900)	→ 97
Wobbe index offset (1879)	→ 97
Wobbe index factor (1880)	→ 98
Energy flow offset (1866)	→ 98
Energy flow factor (1867)	→ 98

Volume 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. The value is entered in the selected volume flow unit.

User entry

Signed floating-point number

Factory setting

0 m³/h

Additional information*Description*

Corrected value = (factor × value) + offset

Volume 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

Corrected volume flow 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 Sm³/h

Additional information**Description**

Corrected value = (factor × value) + offset

Corrected volume flow 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. The value is entered in the selected mass flow unit.

User entry

Signed floating-point number

Factory setting

0 kg/h

Additional information**Description**

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	<i>Description</i> Corrected value = (factor × value) + offset

Sound velocity 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. The value is entered in the selected velocity unit.
User entry	Signed floating-point number
Factory setting	0 m/s
Additional information	<i>Description</i> Corrected value = (factor × value) + offset

Sound velocity 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	<i>Description</i> Corrected value = (factor × value) + offset

Temperature offset

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

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

User entry Signed floating-point number

Factory setting 0 K

Additional information *Description*

Corrected value = (factor × value) + offset

Temperature factor

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

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

User entry Positive floating-point number

Factory setting 1

Additional information *Description*

Corrected value = (factor × value) + offset

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 *Description*

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 fraction 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 fraction 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 offset

Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Molar mass offs. (1875)
Description	Enter 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 Enter quantity factor for the mol mass value.

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. The value is entered in the selected density unit.

User entry Signed floating-point number

Factory setting 0 kg/m³

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

Dynamic viscosity 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 µPa s

Dynamic viscosity 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

Calorific value offset

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/Nm ³

Calorific value factor

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 offset

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/Nm ³
Additional information	<i>Description</i>
	Corrected value = (factor × value) + offset

Wobbe index factor

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 *Description*

Corrected value = (factor × value) + offset

Energy 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 *Description*

Corrected value = (factor × value) + offset

Energy 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

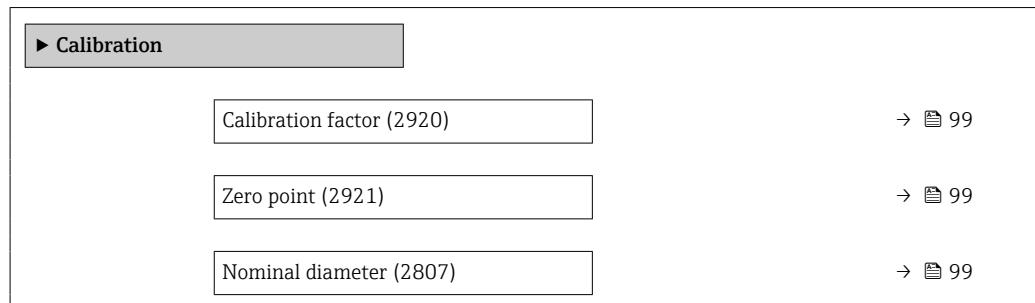
Additional information *Description*

Corrected value = (factor × value) + offset

3.2.7 "Calibration" submenu

Navigation

Expert → Sensor → Calibration



Calibration 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

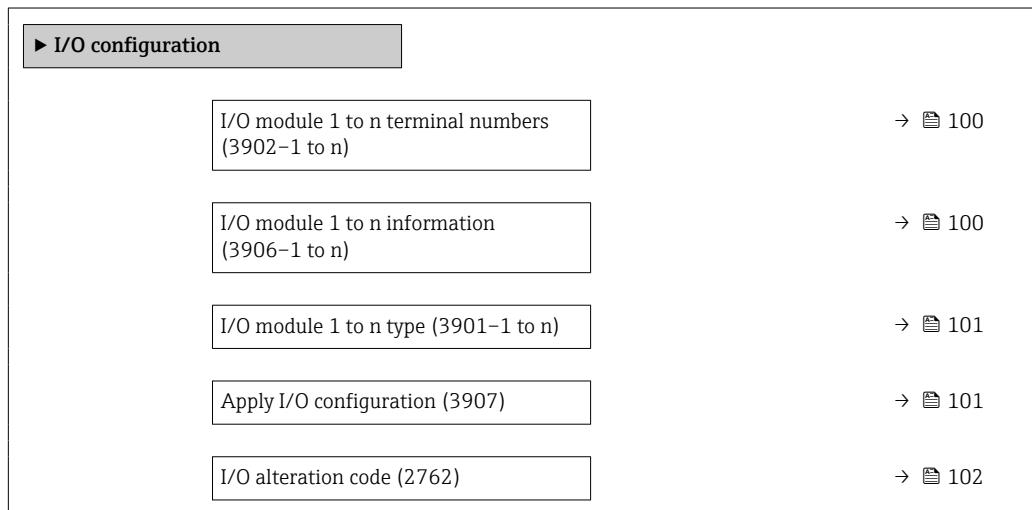
Additional information**Description**

The value is also specified on the sensor nameplate.

3.3 "I/O configuration" submenu

Navigation

Expert → I/O config.



I/O module 1 to n terminal numbers

Navigation

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

Description

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

User interface

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

I/O module 1 to n information

Navigation

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

Description

Displays information about the plugged in I/O module.

* Visibility depends on order options or device settings

- User interface**
- Not plugged
 - Invalid
 - Not configurable
 - Configurable
 - HART

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

I/O module 1 to n type



- Navigation**
- Expert → I/O config. → I/O 1 to n type (3901–1 to n)
- Prerequisite**
- For the following order code:
- "Output; input 2", option **D** "Configurable I/O initial setting off"
 - "Output; input 3", option **D** "Configurable I/O initial setting off"
 - "Output; input 4", option **D** "Configurable I/O initial setting off"
- Description**
- Use this function to select the I/O module type for the configuration of the I/O module.
- Selection**
- Off
 - Current output *
 - Current input *
 - Status input *
 - Pulse/frequency/switch output *
- Factory setting**
- Off

Apply I/O configuration



- Navigation**
- Expert → I/O config. → Apply I/O config (3907)
- Description**
- Use this function to activate the newly configured I/O module type.

* Visibility depends on order options or device settings

Selection ■ No
 ■ Yes

Factory setting No

I/O alteration 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

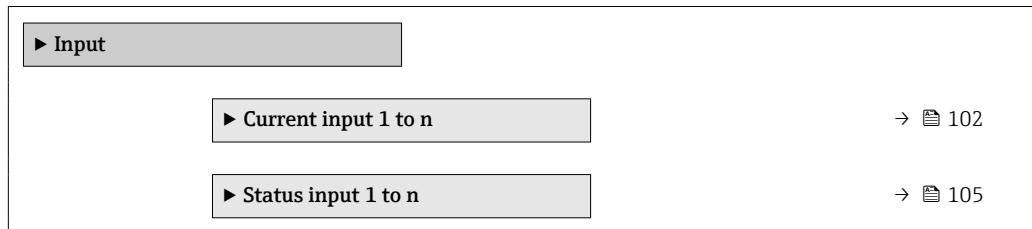
Factory setting 0

Additional information *Description*

The I/O configuration is changed in the **I/O module type** parameter (3901-1 to n) (→ 101).

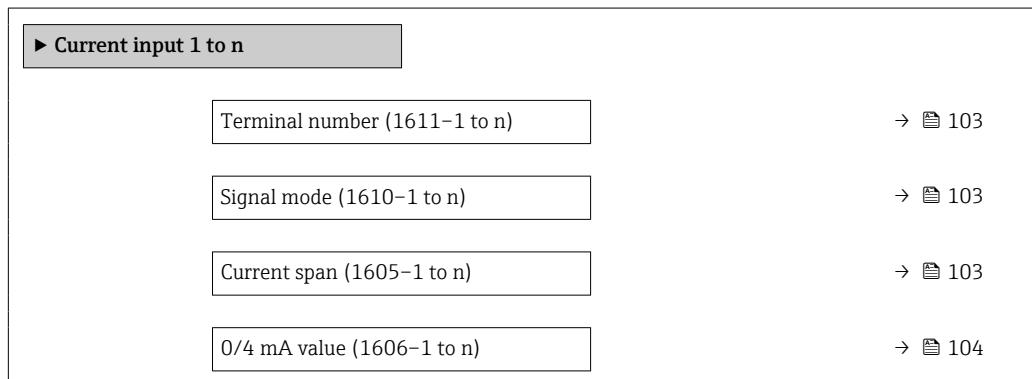
3.4 "Input" submenu

Navigation Expert → Input



3.4.1 "Current input 1 to n" submenu

Navigation Expert → Input → Current input 1 to n



20 mA value (1607-1 to n)	→ 104
Failure mode (1601-1 to n)	→ 105
Failure value (1602-1 to n)	→ 105

Terminal number

Navigation	Expert → Input → Current input 1 to n → Terminal no. (1611-1 to n)
Description	Displays the terminal numbers used by the current input module.
User interface	<ul style="list-style-type: none"> ■ Not used ■ 24-25 (I/O 2) ■ 22-23 (I/O 3) ■ 20-21 (I/O 4)
Additional information	<p>"Not used" option The current input module does not use any terminal numbers.</p>

Signal mode



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

Current span



Navigation	Expert → Input → Current input 1 to n → Current span (1605-1 to n)
Description	Use this function to select the current range for the process value output and the upper and lower level for signal on alarm.

Selection	<ul style="list-style-type: none">■ 4...20 mA (4...20.5 mA)■ 4...20 mA NE (3.8...20.5 mA)■ 4...20 mA US (3.9...20.8 mA)■ 0...20 mA (0...20.5 mA)
Factory setting	Country-specific: <ul style="list-style-type: none">■ 4...20 mA NE (3.8...20.5 mA)■ 4...20 mA US (3.9...20.8 mA)
Additional information	<i>Examples</i>  Sample values for the current range: Current span parameter (0353) (→ 110)

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 (1605) (→ 103)■ Failure mode (1601) (→ 105) <i>Configuration examples</i>  Pay attention to the configuration examples for 4 mA value parameter (0367) (→ 111).

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 (0367) (→ 111).

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 (1605) (→ [103](#)).

Selection

- Alarm
- Last valid value
- Defined value

Factory setting

Alarm

Additional information*Options*

- Alarm
An error message is set.
- Last valid value
The last valid measured value is used.
- Defined value
A user-defined measured value is used (**Failure value** parameter (1602)) (→ [105](#)).

Failure value**Navigation**

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

Prerequisite

In the **Failure mode** parameter (1601) (→ [105](#)), the **Defined value** option is selected.

Description

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

User entry

Signed floating-point number

Factory setting

0

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

Expert → Input → Status input 1 to n

► Status input 1 to n

Terminal number (1358–1 to n)

→ [106](#)

Assign status input (1352–1 to n)

→ [106](#)

Value status input (1353–1 to n)

→ [107](#)

Active level (1351-1 to n)	→ 107
Response time status input (1354-1 to n)	→ 107

Terminal number

Navigation

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

Description

Displays the terminal numbers used by the status input module.

User interface

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

Additional information

"Not used" option

The status input module does not use any terminal numbers.

Assign status input

**Navigation**

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

Description

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

Selection

- Off
- Reset totalizer 1
- Reset totalizer 2
- Reset totalizer 3
- Reset all totalizers
- Flow override

Factory setting

Off

Additional information

Options

- Off
The status input is switched off.
- Reset totalizer 1...3
The individual totalizers are reset.
- Reset all totalizers
All totalizers are reset.
- Flow override
The Flow override (→ 72) is activated.

Note on the Flow override (→ 72):

- The Flow override (→ 72) is enabled as long as the level is at the status input (continuous signal).
- All other assignments react to a change in level (pulse) at the status input.

Value status input

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

Description Displays the current input signal level.

User interface

- High
- Low

Active level

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

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

Selection

- High
- Low

Factory setting High

Response time status input

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

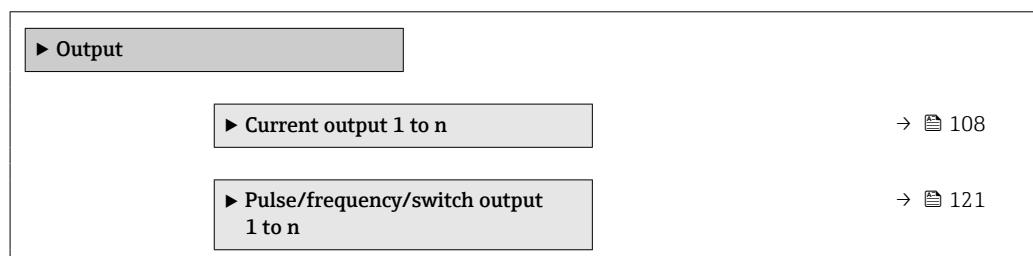
Description Use this function to enter the minimum time period for which the input signal level must be present before the selected function is activated.

User entry 5 to 200 ms

Factory setting 50 ms

3.5 "Output" submenu

Navigation Expert → Output



► Relay output 1 to n	→ 142
► Double pulse output	→ 148

3.5.1 "Current output 1 to n" submenu

Navigation

Expert → Output → Curr.output 1 to n

► Current output 1 to n	
Terminal number (0379–1 to n)	→ 108
Signal mode (0377–1 to n)	→ 109
Process variable current output (0359–1 to n)	→ 109
Current range output (0353–1 to n)	→ 110
Fixed current (0365–1 to n)	→ 111
Lower range value output (0367–1 to n)	→ 111
Upper range value output (0372–1 to n)	→ 113
Measuring mode current output (0351–1 to n)	→ 114
Damping current output (0363–1 to n)	→ 119
Failure behavior current output (0364–1 to n)	→ 119
Failure current (0352–1 to n)	→ 120
Output current (0361–1 to n)	→ 120
Measured current (0366–1 to n)	→ 121

Terminal number

Navigation

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

Description

Displays the terminal numbers used by the current output module.

User interface

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

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

Process variable current output**Navigation**

Expert → Output → Curr.output 1 to n → Proc.var. outp (0359-1 to n)

Description

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

Selection

- Off *
- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity *
- Temperature *
- Pressure *
- Methane fraction *
- Molar mass *
- Density
- Dynamic viscosity *
- Calorific value *
- Wobbe index *
- Energy flow
- Signal strength *
- Signal to noise ratio *
- Acceptance rate *
- Turbulence *
- Flow asymmetry *
- Electronics temperature

* Visibility depends on order options or device settings

Factory setting Volume flow

Current range output



Navigation Expert → Output → Curr.output 1 to n → Curr.range out (0353-1 to n)

Description Select current range for process value output and upper/lower level for alarm signal.

- Selection**
- 4...20 mA NE (3.8...20.5 mA)
 - 4...20 mA US (3.9...20.8 mA)
 - 4...20 mA (4...20.5 mA)
 - 0...20 mA (0...20.5 mA)
 - Fixed value

Factory setting Depends on country:
 ▪ 4...20 mA NE (3.8...20.5 mA)
 ▪ 4...20 mA US (3.9...20.8 mA)

Additional information *Description*



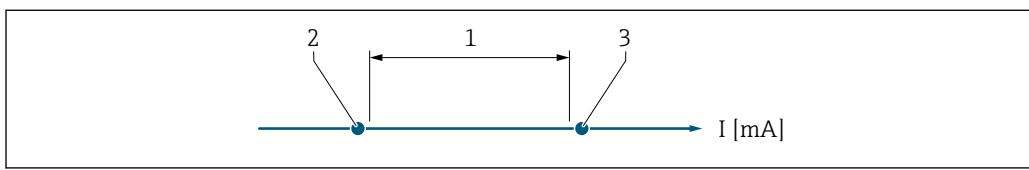
- In the event of a device alarm, the current output adopts the value specified in the **Failure mode** parameter (0364) (→ 119).
- If the measured value is outside the measuring range, the **△S441 Current output 1 to n** diagnostic message is displayed.
- The measuring range is specified via the **Lower range value output** parameter (0367) (→ 111) and **Upper range value output** parameter (0372) (→ 113).

"Fixed current" option

- This option is used for a HART Multidrop network.
- It can only be used for the 4...20 mA HART current output (current output 1).
- The current value is set via the **Fixed current** parameter (0365) (→ 111).

Example

Shows the relationship between the current range for the output of the process value and the two signal on alarm levels:



A0034351

- 1 Current range 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 NE (3.8...20.5 mA)	3.8 to 20.5 mA	< 3.6 mA	> 21.95 mA
4...20 mA US (3.9...20.8 mA)	3.9 to 20.8 mA US	< 3.6 mA	> 21.95 mA

Selection	1	2	3
4...20 mA (4...20.5 mA)	4 to 20.5 mA	< 3.6 mA	> 21.95 mA
0...20 mA (0...20.5 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 **△S441 Current output 1 to n** diagnostic message 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 (0353) (→ [110](#)).

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

Lower range value output



Navigation   Expert → Output → Curr.output 1 to n → Low.range outp (0367–1 to n)

Prerequisite In **Current span** parameter (0353) (→ [110](#)), one of the following options is selected:

- 4...20 mA NE (3.8...20.5 mA)
- 4...20 mA US (3.9...20.8 mA)
- 4...20 mA (4...20.5 mA)
- 0...20 mA (0...20.5 mA)

Description Use this function to enter a value for the start of measuring range.

User entry Signed floating-point number

Factory setting Depends on country:

- m³/h
- ft³/h

Additional information *Description*

Positive and negative values are permitted depending on the process variable assigned in the **Assign current output** parameter (0359) (→ [109](#)). In addition, the value can be

greater than or smaller than the value assigned for the 20 mA current in the **Upper range value output** parameter (0372) (→ 113).

Dependency

i The unit depends on the process variable selected in the **Assign current output** parameter (0359) (→ 109).

Current output behavior

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

- Current span (0353) (→ 110)
- Failure mode (0364) (→ 119)

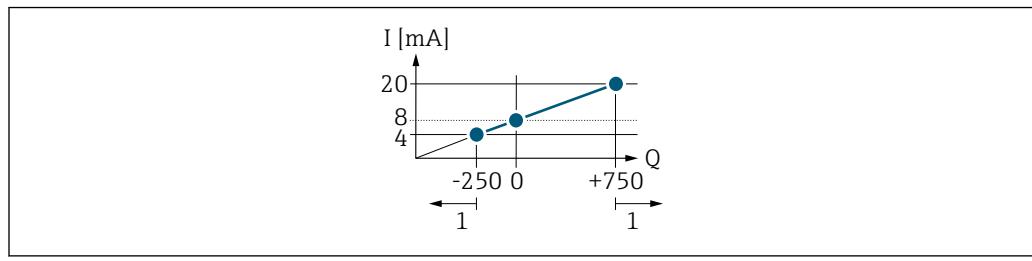
Configuration examples

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

Configuration example A

Measurement mode with **Forward flow** option

- **Lower range value output** parameter (0367) (→ 111) = not equal to zero flow (e.g. -250 m³/h)
- **Upper range value output** parameter (0372) (→ 113) = not equal to zero flow (e.g. +750 m³/h)
- Calculated current value = 8 mA at zero flow

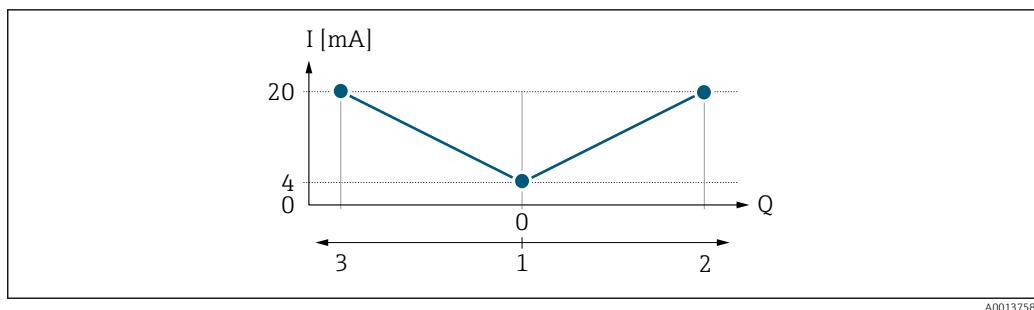


Q Flow
 I Current
 1 Measuring range is exceeded or undershot

The operational range of the measuring device is defined by the values entered for the **Lower range value output** parameter (0367) (→ 111) and **Upper range value output** parameter (0372) (→ 113). If the effective flow exceeds or falls below this operational range, the **△S441 Current output 1 to n** diagnostic message is output.

Configuration example B

Measurement mode with **Forward/Reverse flow** option



- I Current
 Q Flow
 1 Start of measuring range output (0/4 mA)
 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 (0367) (→ 111) and **20 mA value** parameter (0372) (→ 113) must have the same algebraic sign. The value for the **20 mA value** parameter (0372) (→ 113) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (0372) (→ 113) (e.g. flow).

Configuration example C

Measurement mode with **Reverse flow compensation** option

If flow is characterized by severe fluctuations (e.g. when using reciprocating pumps), flow components outside the measuring range are buffered, balanced and output after a maximum delay of 60 s → 114.

Upper range value output



Navigation

Expert → Output → Curr.output 1 to n → Upp.range outp (0372-1 to n)

Prerequisite

In **Current span** parameter (0353) (→ 110), one of the following options is selected:

- 4...20 mA NE (3.8...20.5 mA)
- 4...20 mA US (3.9...20.8 mA)
- 4...20 mA (4...20.5 mA)
- 0...20 mA (0...20.5 mA)

Description

Use this function to enter a value for the end of measuring range.

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 current output** parameter (0359) (→ 109). In addition, the value can be

greater than or smaller than the value assigned for the 0/4 mA current in the **Lower range value output** parameter (0367) (→ 111).

Dependency

i The unit depends on the process variable selected in the **Assign current output** parameter (0359) (→ 109).

Example

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

If the **Forward/Reverse flow** option is selected in the **Measuring mode** parameter (0351) (→ 114), different algebraic signs cannot be entered for the values for the **Lower range value output** parameter (0367) (→ 111) and **Upper range value output** parameter (0372) (→ 113). The **△S441 Current output 1 to n** diagnostic message is displayed.

Configuration examples

i Pay attention to the configuration examples for the **Lower range value output** parameter (0367) (→ 111).

Measuring mode current output



Navigation

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

Prerequisite

One of the following options is selected in the **Assign current output** parameter (0359) (→ 109):

- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity*
- Temperature*
- Pressure*
- Density
- Energy flow
- Signal strength*
- Signal to noise ratio*
- Acceptance rate*
- Turbulence*
- Electronics temperature

One of the following options is selected in the **Current span** parameter (0353) (→ 110):

- 4...20 mA NE (3.8...20.5 mA)
- 4...20 mA US (3.9...20.8 mA)
- 4...20 mA (4...20.5 mA)
- 0...20 mA (0...20.5 mA)

Description

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

* Visibility depends on order options or device settings

Selection	<ul style="list-style-type: none"> ■ Forward flow ■ Forward/Reverse flow * ■ Reverse flow compensation
Factory setting	Forward flow
Additional information	<p><i>Description</i></p> <p>i The process variable that is assigned to the current output via the Assign current output parameter (0359) (→ 109) is displayed below the parameter.</p>

"Forward flow" option

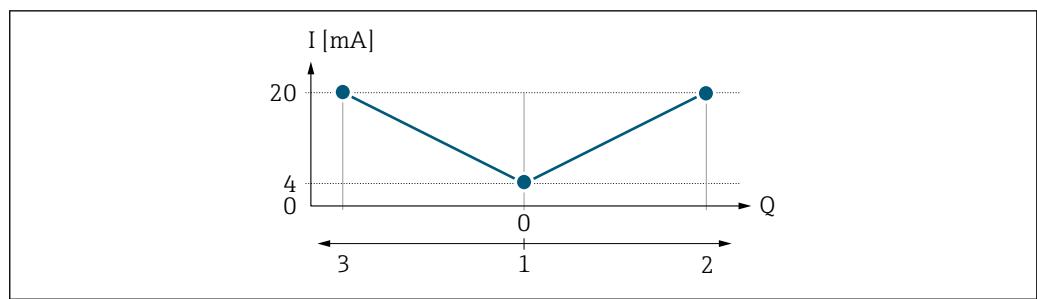
The current output signal is proportional to the process variable assigned. The measuring range is defined by the values that are assigned to the **Lower range value output** parameter (0367) (→ 111) and the **Upper range value output** parameter (0372) (→ 113).

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.:

- start of measuring range = $-5 \text{ m}^3/\text{h}$
- end of measuring range = $10 \text{ m}^3/\text{h}$

"Forward/Reverse flow" option



- | | |
|---|------------------------------------------|
| I | Current |
| Q | Flow |
| 1 | Start of measuring range output (0/4 mA) |
| 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 **Lower range value output** parameter (0367) (→ 111) and **Upper range value output** parameter (0372) (→ 113) must have the same sign.
- The value for the **Upper range value output** parameter (0372) (→ 113) (e.g. reverse flow) corresponds to the mirrored value for the **Upper range value output** parameter (0372) (→ 113) (e.g. forward flow).

"Reverse flow compensation" option

The **Reverse flow compensation** option is primarily used to compensate for intermittent reverse flow that can arise with displacement pumps due to wear or high-viscosity medium. The reverse flow is recorded in a buffer memory and offset against the next forward flow.

* Visibility depends on order options or device settings

In the event of prolonged and undesired reverse flow, flow values can accumulate in the buffer memory. Due to the configuration of the current output, these values are not factored in, however, i.e. there is no compensation for the reverse flow.

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

Examples of how the current output behaves

Example 1

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

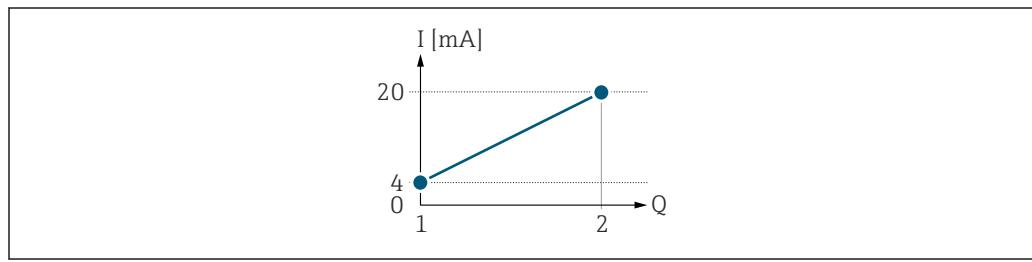


Fig 3 Measuring range

I Current

Q Flow

1 Lower range value (Start of measuring range output)

2 Upper range value (end of measuring range output)

With the following flow response:

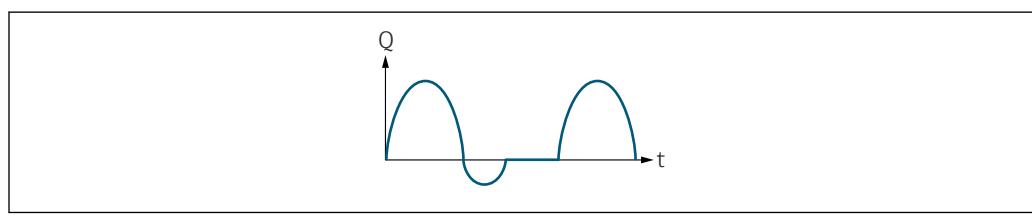


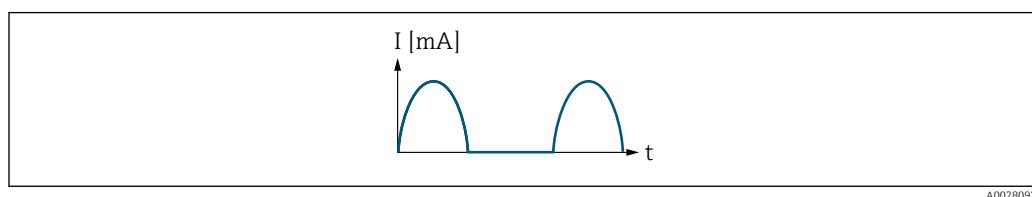
Fig 4 Flow response

Q Flow

t Time

With **Forward flow** option

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

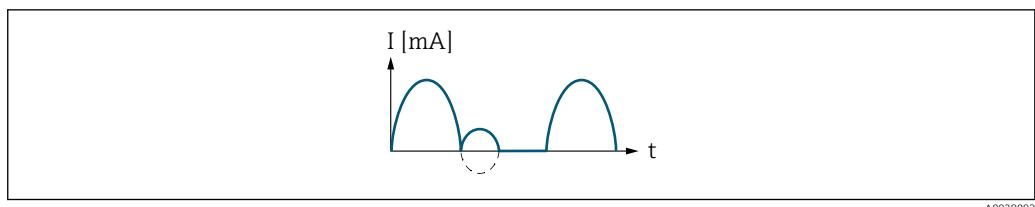


I Current

t Time

With **Forward/Reverse flow** option

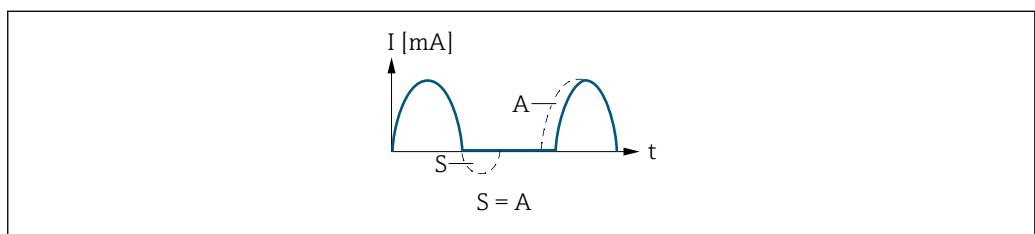
The current output signal is independent of the direction of flow.



I Current
t Time

With Reverse flow compensation option

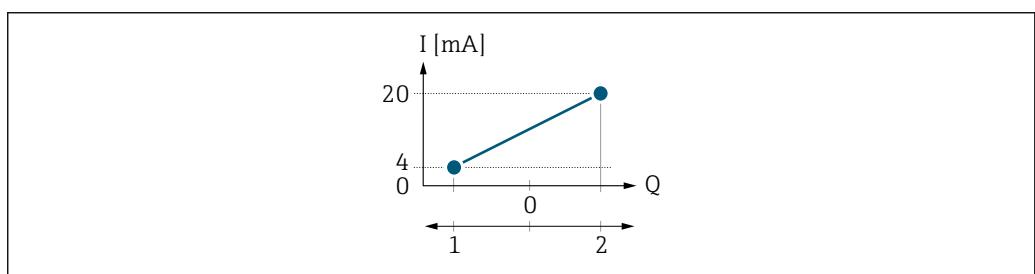
Flow components outside the measuring span are buffered, balanced and output after a maximum delay of 60 s.



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

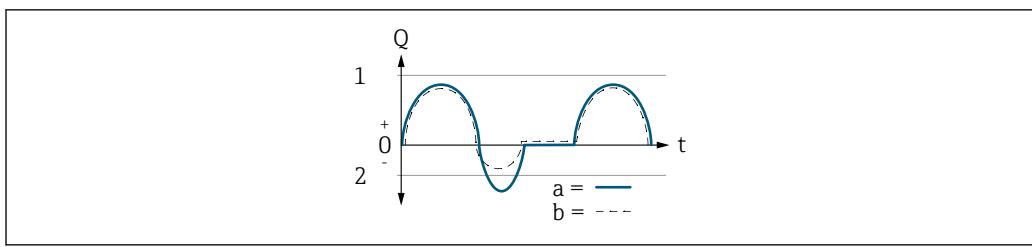
Example 2

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



5 Measuring range
I Current
Q Flow
1 Lower range value (Start of measuring range output)
2 Upper range value (end of measuring range output)

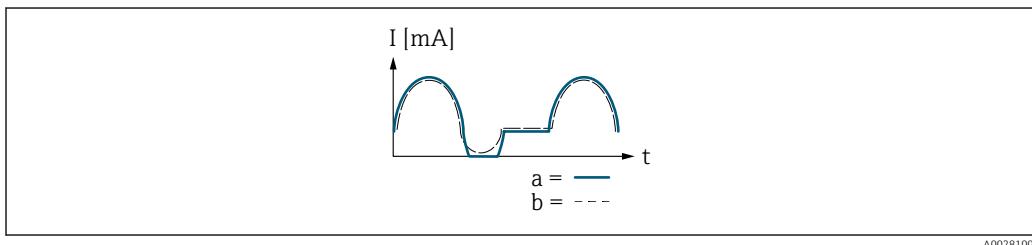
With flow a (–) outside, b (- -) inside the measuring range



Q Flow
 t Time
 1 Lower range value (Start of measuring range output)
 2 Upper range value (end of measuring range output)

With **Forward flow** option

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



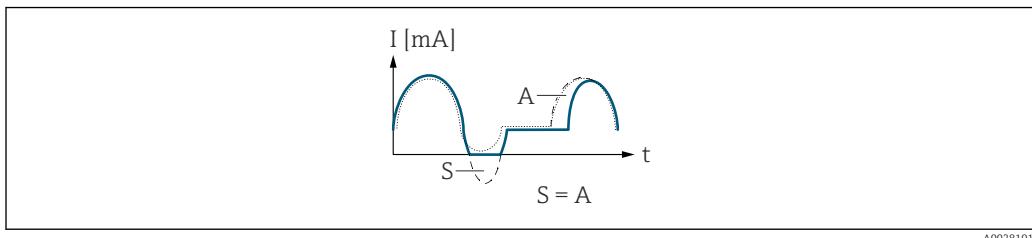
I Current
 t Time

With **Forward/Reverse flow** option

This option cannot be selected here since the values for the **Lower range value output** parameter (0367) (→ 111) and **Upper range value output** parameter (0372) (→ 113) have different signs.

With **Reverse flow compensation** option

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



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

Damping current output**Navigation**

Expert → Output → Curr.output 1 to n → Damp.curr.outp (0363-1 to n)

Prerequisite

A process variable is selected in the **Assign current output** parameter (0359) (→ [109](#)) and one of the following options is selected in the **Current span** parameter (0353) (→ [110](#)):

- 4...20 mA NE (3.8...20.5 mA)
- 4...20 mA US (3.9...20.8 mA)
- 4...20 mA (4...20.5 mA)
- 0...20 mA (0...20.5 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 quickly to fluctuating measured variables.
- If a high time constant is entered, the current output reacts more slowly.

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

Failure behavior current output**Navigation**

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

Prerequisite

A process variable is selected in the **Assign current output** parameter (0359) (→ [109](#)) and one of the following options is selected in the **Current span** parameter (0353) (→ [110](#)):

- 4...20 mA NE (3.8...20.5 mA)
- 4...20 mA US (3.9...20.8 mA)
- 4...20 mA (4...20.5 mA)
- 0...20 mA (0...20.5 mA)

Description

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

Selection

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

Factory setting

Max.

4) proportional transmission behavior with first order delay

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 (0353) (→  110).

"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 (0353) (→  110).

"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 (0352) (→  120).

Failure current**Navigation**

  Expert → Output → Curr.output 1 to n → Fail. current (0352–1 to n)

Prerequisite

The **Defined value** option is selected in the **Failure mode** parameter (0364) (→  119).

Description

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

User entry

0 to 22.5 mA

Factory setting

22.5 mA

Output current**Navigation**

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

Description

Displays the current value currently calculated for the current output.

User interface

3.59 to 22.5 mA

Measured current

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

Description Displays the actual measured value of the output current.

User interface 0 to 30 mA

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

Navigation

  Expert → Output → PFS output 1 to n

**► Pulse/frequency/switch output
1 to n**

Terminal number (0492–1 to n)

→  122

Signal mode (0490–1 to n)

→  123

Operating mode (0469–1 to n)

→  123

Assign pulse output (0460–1 to n)

→  125

Pulse scaling (0455–1 to n)

→  125

Pulse width (0452–1 to n)

→  126

Measuring mode (0457–1 to n)

→  126

Failure mode (0480–1 to n)

→  127

Pulse output (0456–1 to n)

→  128

Assign frequency output (0478–1 to n)

→  128

Minimum frequency value
(0453–1 to n)

→  129

Maximum frequency value
(0454–1 to n)

→  129

Measuring value at minimum
frequency (0476–1 to n)

→  130

Measuring value at maximum
frequency (0475–1 to n)

→  130

Measuring mode (0479-1 to n)	→ 131
Damping output (0477-1 to n)	→ 131
Response time (0491-1 to n)	→ 132
Failure mode (0451-1 to n)	→ 133
Failure frequency (0474-1 to n)	→ 134
Output frequency (0471-1 to n)	→ 134
Switch output function (0481-1 to n)	→ 134
Assign diagnostic behavior (0482-1 to n)	→ 135
Assign limit (0483-1 to n)	→ 136
Switch-on value (0466-1 to n)	→ 138
Switch-off value (0464-1 to n)	→ 138
Assign flow direction check (0484-1 to n)	→ 139
Assign status (0485-1 to n)	→ 139
Switch-on delay (0467-1 to n)	→ 139
Switch-off delay (0465-1 to n)	→ 140
Failure mode (0486-1 to n)	→ 140
Switch state (0461-1 to n)	→ 141
Invert output signal (0470-1 to n)	→ 141

Terminal number

Navigation

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

Description

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

User interface

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

Additional information

"Not used" option

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

Signal mode

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

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

Selection

- Passive
- Active *
- Passive NE

Factory setting Passive

Operating mode

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

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

Selection

- Pulse
- Frequency
- Switch

Factory setting Pulse

Additional information

"Pulse" option

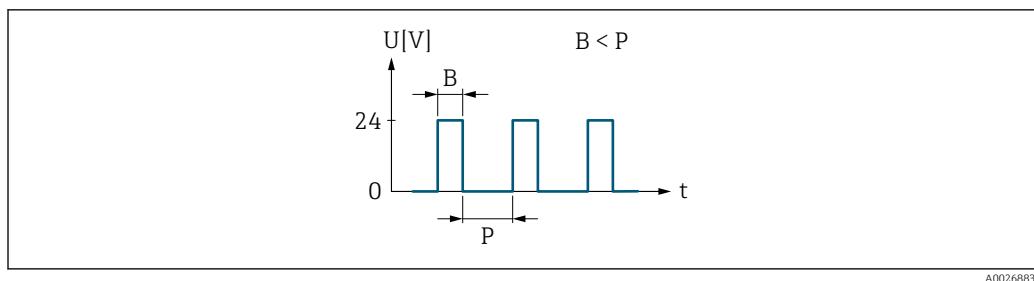
Quantity-dependent pulse with configurable pulse width

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

Example

- Flow rate approx. 100 g/s
- Pulse value 0.1 g
- Pulse width 0.05 ms
- Pulse rate 1000 Impuls/s

* Visibility depends on order options or device settings



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

B Pulse width entered

P Pauses between the individual pulses

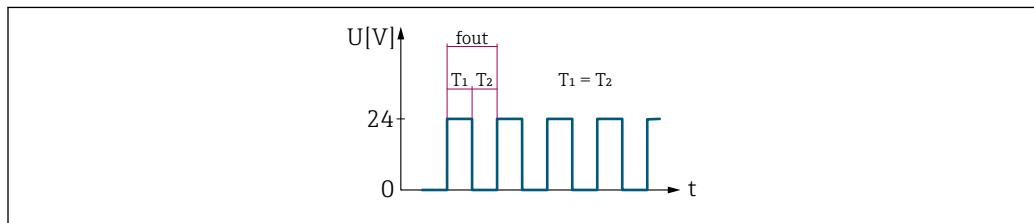
"Frequency" option

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



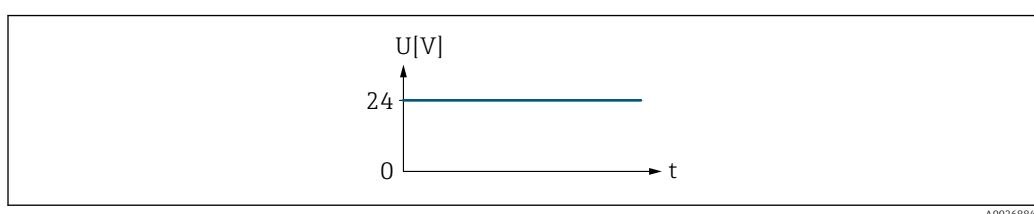
■ 7 Flow-proportional frequency output

"Switch" option

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

Example

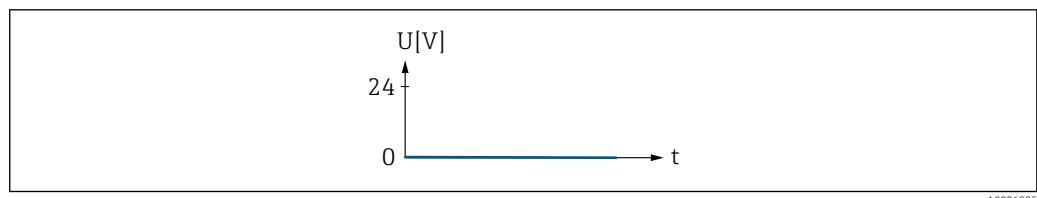
Alarm response without alarm



■ 8 No alarm, high level

Example

Alarm response in case of alarm



A0026885

图 9 Alarm, low level

Assign pulse output

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

Prerequisite The **Pulse** option is selected in the **Operating mode** parameter (0469) (→ [图 123](#)).

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

- Selection**
- Off
 - Volume flow
 - Corrected volume 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 (0469) (→ [图 123](#)) and a process variable is selected in the **Assign pulse output** parameter (0460) (→ [图 125](#)).

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 → [图 252](#)

Additional information *User entry*

Weighting of the pulse output with a quantity.

The lower the pulse value, the

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

Pulse width**Navigation**

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

Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (0469) (→ 123) and a process variable is selected in the **Assign pulse output** parameter (0460) (→ 125).

Description

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

User entry

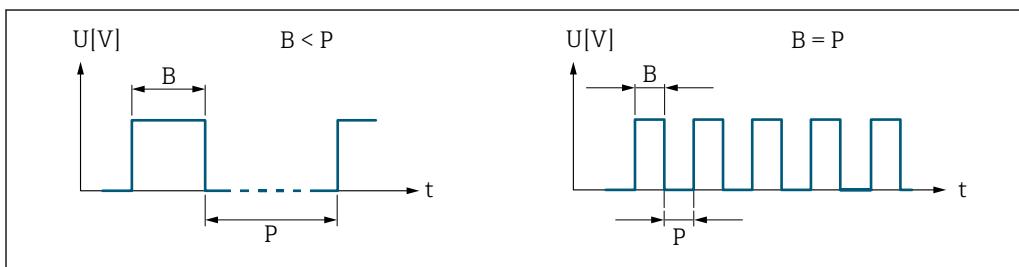
0.05 to 2 000 ms

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 **443 Pulse output 1 to n** diagnostic message.



B Pulse width entered
P Pauses between the individual pulses

Example

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

Measuring mode**Navigation**

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

Prerequisite

The "Pulse" option is selected in the "Operating mode" parameter (0469) and one of the following options is selected in the "Assign pulse output" parameter (0460):

- Volume flow
- Corrected volume flow
- Mass flow
- Energy flow

Description

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

Selection	<ul style="list-style-type: none"> ▪ Forward flow ▪ Forward/Reverse flow ▪ Reverse flow ▪ Reverse flow compensation
Factory setting	Forward flow
Additional information	<p><i>Options</i></p> <ul style="list-style-type: none"> ▪ Forward flow Positive flow is output, negative flow is not output. ▪ Forward/Reverse flow Positive and negative flow are output (absolute value), but a distinction is not made between positive and negative flow. ▪ Reverse flow Negative flow is output, positive flow is not output. ▪ Reverse flow compensation The flow components outside the measuring range are buffered, balanced and output after a maximum delay of 60 s. <p> For a detailed description of the options available, see the Measuring mode parameter (0351) (→ 114)</p>
	<p><i>Examples</i></p> <p> For a detailed description of the configuration examples, see the Measuring mode parameter (0351) (→ 114)</p>

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 (0469) (→ 123) and a process variable is selected in the Assign pulse output parameter (0460) (→ 125).
Description	Use this function to select the failure mode of the 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	<p><i>Description</i></p> <p>The dictates of safety render it advisable to ensure that the pulse output shows a predefined behavior in the event of a device alarm.</p> <p><i>Options</i></p> <ul style="list-style-type: none"> ▪ Actual value In the event of a device alarm, the pulse output continues on the basis of the current flow measurement. The fault is ignored. ▪ No pulses In the event of a device alarm, the pulse output is "switched off". <p>NOTICE! A device alarm indicates a serious fault with the measuring device. The measurement quality may possibly be influenced and may no longer be guaranteed. The</p>

Actual value option is only recommended if it is ensured that all possible alarm conditions do not influence the measurement quality.

Pulse output

Navigation

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

Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (0469) (→ 123) parameter.

Description

Displays the pulse frequency currently output.

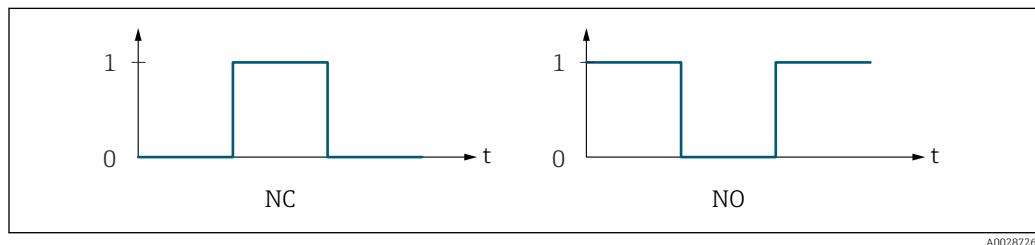
User interface

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 output signal** parameter (0470) (→ 141) 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 (0480) (→ 127)) can be configured.

Assign frequency output



Navigation

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

Prerequisite

The **Frequency** option is selected in **Operating mode** parameter (0469) (→ 123).

Description

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

Selection

- Off
- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity

- Sound velocity*
- Temperature*
- Pressure*
- Methane fraction*
- Molar mass*
- Density*
- Dynamic viscosity*
- Calorific value*
- Wobbe index*
- Energy flow*
- Signal strength*
- Signal to noise ratio*
- Acceptance rate*
- Turbulence*
- Flow asymmetry*
- Electronics temperature

Factory setting Off

Minimum frequency 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 (0469) (→ 123) and a process variable is selected in the **Assign frequency output** parameter (0478) (→ 128).

Description Use this function to enter the minimum frequency.

User entry 0.0 to 10 000.0 Hz

Factory setting 0.0 Hz

Maximum frequency value



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

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (0469) (→ 123) and a process variable is selected in the **Assign frequency output** parameter (0478) (→ 128).

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

Measuring value at minimum frequency



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 (0469) (→ [123](#)) and a process variable is selected in the **Assign frequency output** parameter (0478) (→ [128](#)).

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 frequency output** parameter (0478) (→ [128](#)).

Measuring value at maximum frequency



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 (0469) (→ [123](#)) and a process variable is selected in the **Assign frequency output** parameter (0478) (→ [128](#)).

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 frequency output** parameter (0478) (→ [128](#)).

Measuring mode**Navigation**

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

Prerequisite

The **Frequency** option is selected in the **Operating mode** parameter (0469) (→ 123) and one of the following options is selected in the **Assign frequency output** parameter (0478) (→ 128):

- Off
- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity*
- Temperature*
- Pressure*
- Density
- Energy flow
- Signal strength*
- Signal to noise ratio*
- Acceptance rate*
- Turbulence*
- Electronics temperature

Description

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

Selection

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

Factory setting

Forward flow

Additional information*Options*

For a detailed description of the options available, see the **Measuring mode** parameter (0351) (→ 114)

Examples

For a detailed description of the configuration examples, see the **Measuring mode** parameter (0351) (→ 114)

Damping output**Navigation**

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

Prerequisite

The "Frequency" option is selected in the "Operating mode" parameter (0469) and one of the following options is selected in the "Assign frequency output" parameter (0478):

- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity

* Visibility depends on order options or device settings

- Temperature *
- Pressure *
- Density
- Energy flow
- Signal strength *
- Signal to noise ratio *
- Acceptance rate *
- Turbulence *
- Electronics temperature

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)

Prerequisite

The "Frequency" option is selected in the "Operating mode" parameter (0469) and one of the following options is selected in the "Assign frequency output" parameter (0478):

- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity *
- Temperature *
- Pressure *
- Density
- Energy flow
- Signal strength *
- Signal to noise ratio *
- Acceptance rate *
- Turbulence *
- Electronics temperature

* Visibility depends on order options or device settings

5) proportional transmission behavior with first order delay

Description	Displays the response time. This specifies how quickly the pulse/frequency/switch output reaches 63 % of 100 % of the measured value change when the measured value changes.
User interface	Positive floating-point number
Additional information	<p><i>Description</i></p> <p> The response time is made up of the time specified for the following dampings:</p> <ul style="list-style-type: none"> ▪ Damping of pulse/frequency/switch output → 119 and ▪ Depending on the measured variable assigned to the output. <ul style="list-style-type: none"> ▪ 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 (0469) (→ 123) and a process variable is selected in the Assign frequency output parameter (0478) (→ 128).
Description	Use this function to select the failure mode of the frequency output in the event of a device alarm.
Selection	<ul style="list-style-type: none"> ▪ Actual value ▪ Defined value ▪ 0 Hz
Factory setting	0 Hz
Additional information	<p><i>Options</i></p> <ul style="list-style-type: none"> ▪ Actual value In the event of a device alarm, the frequency output continues on the basis of the current flow measurement. The device alarm is ignored. ▪ Defined value In the event of a device alarm, the frequency output continues on the basis of a predefined value. The Failure frequency (0474) (→ 134) replaces the current measured value, making it possible to bypass the device alarm. The actual measurement is switched off for the duration of the device alarm. ▪ 0 Hz In the event of a device alarm, the frequency output is "switched off". <p>NOTICE! A device alarm indicates a serious fault with the measuring device. The measurement quality may possibly be influenced and may no longer be guaranteed. The Actual value option is only recommended if it is ensured that all possible alarm conditions do not influence the measurement quality.</p>

Failure frequency



Navigation	Expert → Output → PFS output 1 to n → Failure freq. (0474–1 to n)
Prerequisite	In the Operating mode parameter (0469) (→ 123), the Frequency option is selected, in the Assign frequency output parameter (0478) (→ 128) a process variable is selected, and in the Failure mode parameter (0451) (→ 133), the Defined value option is selected.
Description	Enter frequency output value in alarm condition.
User entry	0.0 to 12 500.0 Hz
Factory setting	0.0 Hz

Output frequency

Navigation	Expert → Output → PFS output 1 to n → Output freq. (0471–1 to n)
Prerequisite	In the Operating mode parameter (0469) (→ 123), the Frequency option is selected.
Description	Displays the actual value of the output frequency which is currently measured.
User interface	0.0 to 12 500.0 Hz

Switch output function



Navigation	Expert → Output → PFS output 1 to n → Switch out funct (0481–1 to n)
Prerequisite	The Switch option is selected in the Operating mode parameter (0469) (→ 123).
Description	Use this function to select a function for the switch output.
Selection	<ul style="list-style-type: none">▪ Off▪ On▪ Diagnostic behavior▪ Limit▪ Flow direction check▪ Status
Factory setting	Off

Additional information*Options*

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

Assign diagnostic behavior**Navigation**

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

Prerequisite

- In the **Operating mode** parameter (0469) (→ [123](#)), the **Switch** option is selected.
- In the **Switch output function** parameter (0481) (→ [134](#)), the **Diagnostic behavior** option is selected.

Description

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

Selection

- Alarm
- Alarm or warning
- Warning

Factory setting

Alarm

Additional information*Description*

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 (0469) (→ 123).
- The **Limit** option is selected in the **Switch output function** parameter (0481) (→ 134).

Description

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

Selection

- Off
- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity *
- Temperature *
- Pressure *
- Methane fraction *
- Molar mass *
- Density
- Dynamic viscosity *
- Calorific value *
- Wobbe index *
- Energy flow
- Signal strength *
- Signal to noise ratio *
- Acceptance rate *
- Turbulence *
- Flow asymmetry *
- Electronics temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3

Factory setting

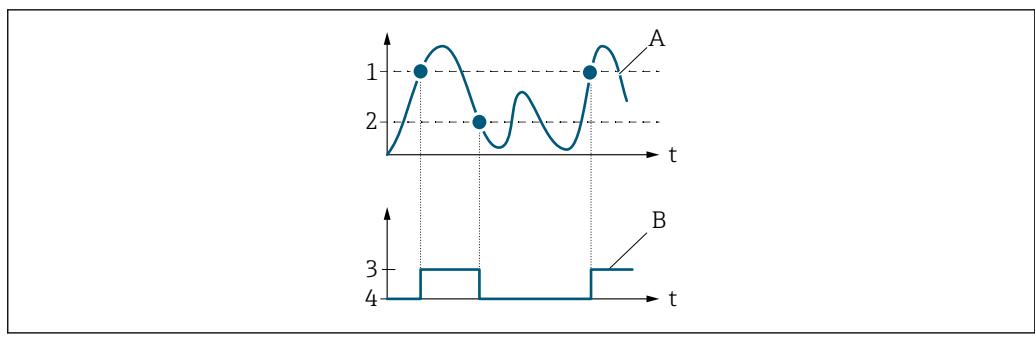
Volume flow

Additional information*Description*

Behavior of status output when Switch-on value (0466) > Switch-off value (0464):

- Process variable > Switch-on value (0466): transistor is conductive
- Process variable < Switch-off value (0464): transistor is non-conductive

* Visibility depends on order options or device settings

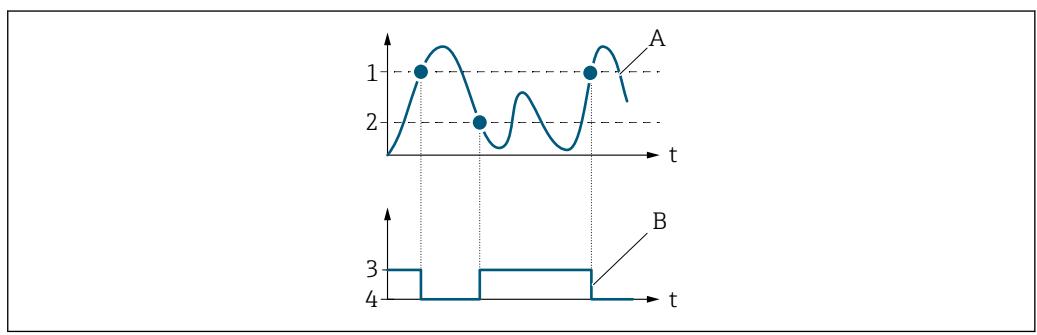


A0026891

- 1 Switch-on value (0466)
- 2 Switch-off value (0464)
- 3 Conductive
- 4 Non-conductive
- A Process variable
- B Status output

Behavior of status output when Switch-on value (0466) < Switch-off value (0464):

- Process variable < Switch-on value (0466): transistor is conductive
- Process variable > Switch-off value (0464): transistor is non-conductive

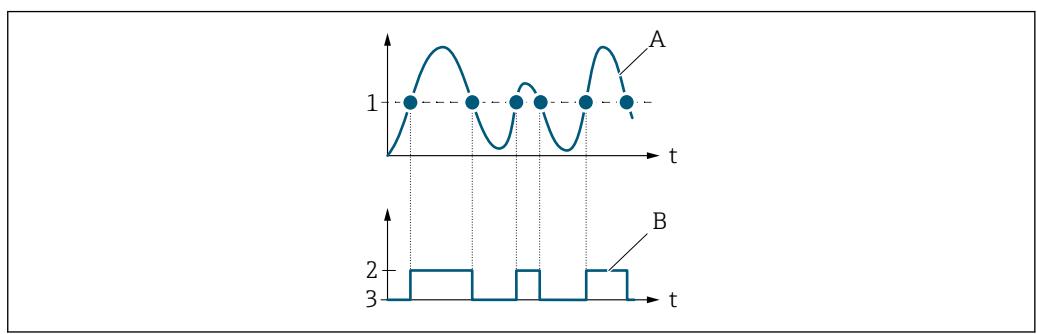


A0026892

- 1 Switch-off value (0464)
- 2 Switch-on value (0466)
- 3 Conductive
- 4 Non-conductive
- A Process variable
- B Status output

Behavior of status output when Switch-on value (0466) = Switch-off value (0464):

- Process variable > Switch-on value (0466): transistor is conductive
- Process variable < Switch-off value (0464): transistor is non-conductive



A0026893

- 1 Switch-on value (0466) = Switch-off value (0464)
- 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 (0469) (→ 123).
- The **Limit** option is selected in the **Switch output function** parameter (0481) (→ 134).

Description

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

User entry

Signed floating-point number

Factory setting

Depends on country

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 (0466) > Switch-off value (0464).

Dependency

The unit depends on the process variable selected in the **Assign limit** parameter (0483) (→ 136).

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 (0469) (→ 123).
- The **Limit** option is selected in the **Switch output function** parameter (0481) (→ 134).

Description

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

User entry

Signed floating-point number

Factory setting

Depends on country

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 (0466) > Switch-off value (0464).

Dependency

The unit depends on the process variable selected in the **Assign limit** parameter (0483) (→ 136).

Assign flow direction check

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

Prerequisite

- The **Switch** option is selected in the **Operating mode** parameter (0469) (→ [123](#)).
- The **Flow direction check** option is selected in the **Switch output function** parameter (0481) (→ [134](#)).

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

Selection

- Off
- Volume flow
- Corrected volume flow
- 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 (0469) (→ [123](#)).
- The **Status** option is selected in the **Switch output function** parameter (0481) (→ [134](#)).

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

Selection

- Off
- Low flow cut off
- Product identification *

Factory setting Low flow cut off

Additional information *Options*

If empty pipe detection or low flow cut off are active, 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 (0469) (→ [123](#)).
- The **Limit** option is selected in the **Switch output function** parameter (0481) (→ [134](#)).

* Visibility depends on order options or device settings

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 (0469) (→ 123).
- The **Limit** option is selected in the **Switch output function** parameter (0481) (→ 134).

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

User entry 0.0 to 100.0 s

Factory setting 0.0 s

Failure mode



Navigation Expert → Output → PFS output 1 to n → Failure mode (0486–1 to n)

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

Selection

- Actual status
- Open
- Closed

Factory setting Open

Additional information *Options*

- Actual status
In the event of a device alarm, faults are ignored and the current behavior of the input value is output by the switch output. The **Actual status** option behaves in the same way as the current input value.
- Open
In the event of a device alarm, the switch output's transistor is set to **non-conductive**.
- Closed
In the event of a device alarm, the switch output's transistor is set to **conductive**.

Switch state

Navigation  Expert → Output → PFS output 1 to n → Switch state (0461–1 to n)

Prerequisite The **Switch** option is selected in the **Operating mode** parameter (0469) (→  123).

Description Displays the current switch status of the status output.

User interface

- Open
- Closed

Additional information

User interface

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

Invert output signal



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

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

Selection

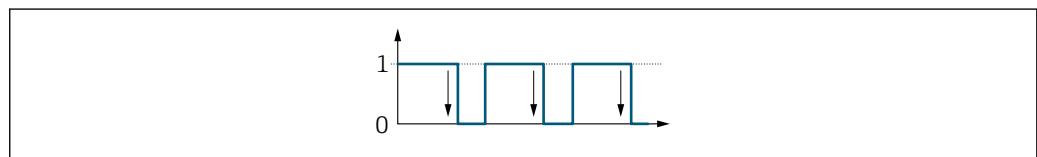
- No
- Yes

Factory setting No

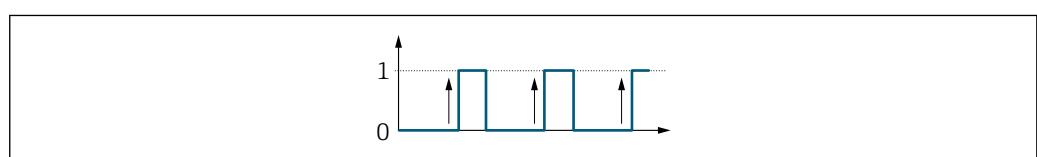
Additional information

Selection

No option (passive - negative)



Yes option (passive - positive)



3.5.3 "Relay output 1 to n" submenu

Navigation

Expert → Output → Relay output 1 to n

► Relay output 1 to n	
Terminal number (0812-1 to n)	→ 142
Relay output function (0804-1 to n)	→ 143
Assign flow direction check (0808-1 to n)	→ 143
Assign limit (0807-1 to n)	→ 144
Assign diagnostic behavior (0806-1 to n)	→ 144
Assign status (0805-1 to n)	→ 145
Switch-off value (0809-1 to n)	→ 145
Switch-off delay (0813-1 to n)	→ 146
Switch-on value (0810-1 to n)	→ 146
Switch-on delay (0814-1 to n)	→ 147
Failure mode (0811-1 to n)	→ 147
Switch state (0801-1 to n)	→ 147
Powerless relay status (0816-1 to n)	→ 148

Terminal number

Navigation

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

Description

Displays the terminal numbers used by the relay output module.

User interface

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

Additional information

"Not used" option

The relay output module does not use any terminal numbers.

Relay output function

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

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

Selection

- Closed
- Open
- Diagnostic behavior
- Limit
- Flow direction check
- Status

Factory setting Closed

Additional information *Selection*

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

Assign flow direction check

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

Prerequisite The **Flow direction check** option is selected in the **Relay output function** parameter (0804) (→ 143).

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

Selection

- Off
- Volume flow
- Corrected volume 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 output function** parameter (0804) (→ 143).

Description

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

Selection

- Off
- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity *
- Temperature *
- Pressure *
- Methane fraction *
- Molar mass *
- Density
- Dynamic viscosity *
- Calorific value *
- Wobbe index *
- Energy flow
- Signal strength *
- Signal to noise ratio *
- Acceptance rate *
- Turbulence *
- Flow asymmetry *
- Electronics temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3

Factory setting

Volume flow

Assign diagnostic behavior**Navigation**

Expert → Output → Relay output 1 to n → Assign diag. beh (0806–1 to n)

Prerequisite

In the **Relay output function** parameter (0804) (→ 143), the **Diagnostic behavior** option is selected.

Description

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

Selection

- Alarm
- Alarm or warning
- Warning

Factory setting

Alarm

* Visibility depends on order options or device settings

Additional information*Description*

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

Selection

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

Assign status**Navigation**

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

Prerequisite

In the **Relay output function** parameter (0804) (→ 143), the **Digital Output** option is selected.

Description

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

Selection

- Off
- Low flow cut off
- Product identification *

Factory setting

Off

Switch-off value**Navigation**

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

Prerequisite

The **Limit** option is selected in the **Relay output function** parameter (0804) (→ 143).

Description

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

User entry

Signed floating-point number

Factory setting

0 m³/h

* Visibility depends on order options or device settings

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 (0466) > Switch-off value (0464).

Dependency

 The unit is dependent on the process variable selected in the **Assign limit** parameter (0807) (→ 144).

Switch-off delay**Navigation**

 Expert → Output → Relay output 1 to n → Switch-off delay (0813-1 to n)

Prerequisite

In the **Relay output function** parameter (0804) (→ 143), 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 output function** parameter (0804) (→ 143).

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 (0466) > Switch-off value (0464).

Dependency

 The unit is dependent on the process variable selected in the **Assign limit** parameter (0807) (→ 144).

Switch-on delay

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

Prerequisite In the **Relay output function** parameter (0804) (→ 143), 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 state

Navigation Expert → Output → Relay output 1 to n → Switch state (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 status**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 output	
Master terminal number (0981)	→ 149
Slave terminal number (0990)	→ 149
Signal mode (0991)	→ 149
Assign pulse output (0982)	→ 150
Value per pulse (0983)	→ 150
Pulse width (0986)	→ 150
Phase shift (0992)	→ 151
Measuring mode (0984)	→ 151

Failure mode (0985)	→ 152
Pulse output (0987)	→ 152
Invert output signal (0993)	→ 152

Master terminal number

Navigation	Expert → Output → Double pulse out → Master term. no. (0981)
Description	Displays the master terminal number for the double pulse output.
User interface	<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 double pulse output does not use any terminal numbers.</p>

Slave terminal number

Navigation	Expert → Output → Double pulse out → Slave term. no. (0990)
Description	Displays the slave terminal number for the double pulse output.
User interface	<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 double pulse output does not use any terminal numbers.</p>

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	<ul style="list-style-type: none"> ■ Passive ■ Active * ■ Passive NE

* Visibility depends on order options or device settings

Factory setting Passive

Assign pulse output



Navigation Expert → Output → Double pulse out → Assign pulse (0982)

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

Selection

- Off
- Volume flow
- Corrected volume 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

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 (0452) (→ 126)

Phase shift

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

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

Selection

- 90°
- 180°

Factory setting 90°

Additional information *Selection*

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

Measuring mode

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

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

Selection

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

Factory setting Forward flow

Additional information *Selection*

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

For a detailed description of the options available, see the **Measuring mode** parameter (0351) (→ 114)

Examples

For a detailed description of the configuration examples, see the **Measuring mode** parameter (0351) (→ 114)

Failure mode**Navigation**

Expert → Output → Double pulse out → Failure mode (0985)

Description

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

Selection

- Actual value
- No pulses

Factory setting

No pulses

Additional information*Description*

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

Options

- 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 case of the double pulse output, if a device alarm occurs one pulse output is stopped and the other pulse output runs at the maximum pulse frequency.

NOTICE! A device alarm indicates a serious fault with the measuring device. The measurement quality may possibly be influenced and may no longer be guaranteed. The **Actual value** option is only recommended if it is ensured that all possible alarm conditions do not influence the measurement quality.

Pulse output**Navigation**

Expert → Output → Double pulse out → Pulse output (0987)

Description

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

User interface

Positive floating-point number

Additional information For a detailed description and example: **Pulse output** parameter (0456–1 to n)
(→ 58)

Invert output signal**Navigation**

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

Description

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

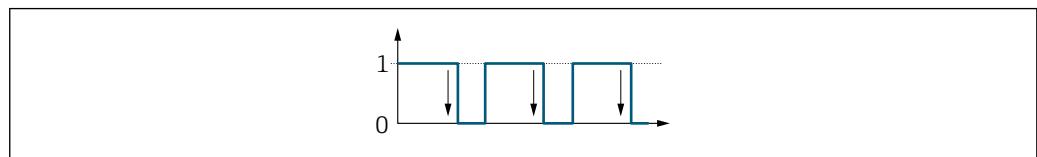
Selection

- No
- Yes

Factory setting No

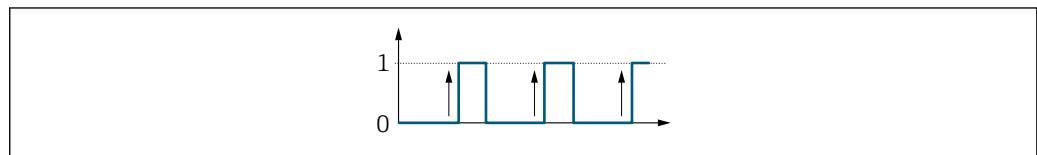
Additional information Selection

No option (passive - negative)



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Yes option (passive - positive)

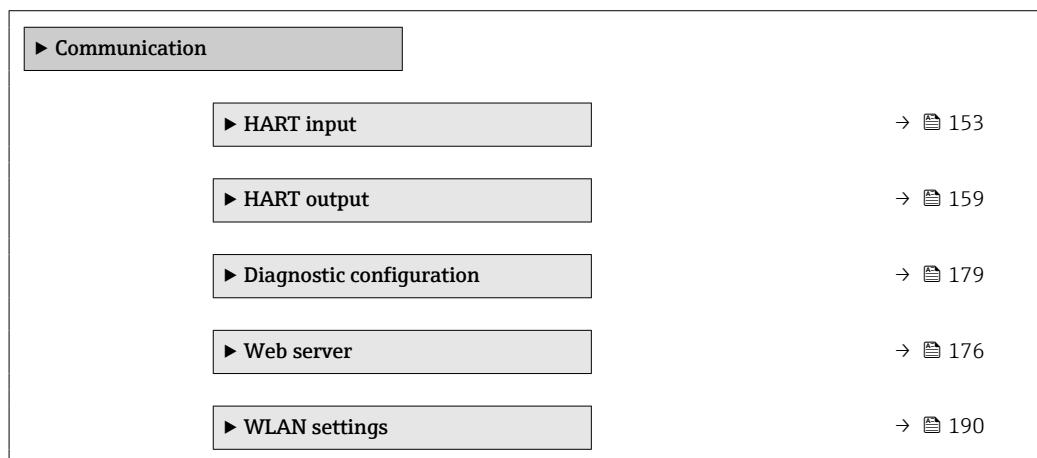


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3.6 "Communication" submenu

Navigation

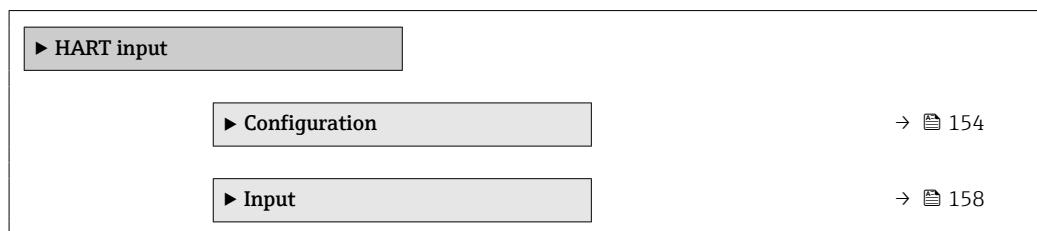
Expert → Communication



3.6.1 "HART input" submenu

Navigation

Expert → Communication → HART input



"Configuration" submenu**Navigation**
 Expert → Communication → HART input → Configuration

▶ Configuration	
Capture mode (7001)	→  154
Device ID (7007)	→  155
Device type (7008)	→  155
Manufacturer ID (7009)	→  155
Burst command (7006)	→  156
Slot number (7010)	→  156
Timeout (7005)	→  157
Failure mode (7011)	→  157
Failure value (7012)	→  158

Capture mode**Navigation**
 Expert → Communication → HART input → Configuration → Capture mode (7001)
Description

Use this function to select the capture mode via burst or master communication.

Selection

- Off
- Burst network
- Master network

Factory setting

Off

Additional information*"Burst network" option*

The device records data transmitted via burst in the network.

 An external pressure sensor must be in the burst mode.

"Master network" option

In this case, the device must be located in a HART network in which a HART master (control) queries the measured values of the up to 64 network participants. The device reacts only to the responses of a specific device in the network. Device ID, device type, manufacturer ID and the HART commands used by the master must be defined.

Device ID

Navigation	Expert → Communication → HART input → Configuration → Device ID (7007)
Prerequisite	The Master network option is selected in the Capture mode parameter (7001) (→ 154).
Description	Use this function to enter the device ID of the HART slave device whose data are to be recorded.
User entry	6-digit value: <ul style="list-style-type: none">■ Via local operation: enter as hexadecimal or decimal number■ Via operating tool: enter as decimal number
Factory setting	0
Additional information	In addition to the device ID and manufacturer ID, the device type is part of the unique ID. Each HART device is uniquely identified by the unique device ID.

Device type

Navigation	Expert → Communication → HART input → Configuration → Device type (7008)
Prerequisite	In the Capture mode parameter (7001) (→ 154), the Master network option is selected.
Description	Use this function to enter the device type of the HART slave device whose data are to be recorded.
User entry	2-digit hexadecimal number
Factory setting	0x00
Additional information	In addition to the device ID and manufacturer ID, the device type is part of the unique ID. Each HART device is uniquely identified by the unique device ID.

Manufacturer ID

Navigation	Expert → Communication → HART input → Configuration → Manufacturer ID (7009)
Prerequisite	The Master network option is selected in the Capture mode parameter (7001) (→ 154).
Description	Use this function to enter the manufacturer ID of the HART slave device whose data are to be recorded.

User entry	2-digit value: ■ Via local operation: enter as hexadecimal or decimal number ■ Via operating tool: enter as decimal number
Factory setting	0
Additional information	 In addition to the device ID and manufacturer ID, the device type is part of the unique ID. Each HART device is uniquely identified by the unique device ID.

Burst command	
Navigation	 Expert → Communication → HART input → Configuration → Burst command (7006)
Prerequisite	The Burst network option or the Master network option are selected in the Capture mode parameter (7001) (→  154).
Description	Use this function to select the burst command to be recorded.
Selection	<ul style="list-style-type: none">■ Command 1■ Command 3■ Command 9■ Command 33
Factory setting	Command 1
Additional information	<i>Selection</i> <ul style="list-style-type: none">■ Command 1 Use this function to capture the primary variable.■ Command 3 Use this function to capture the dynamic HART variables and the current.■ Command 9 Use this function to capture the dynamic HART variables including the associated status.■ Command 33 Use this function to capture the dynamic HART variables including the associated unit.

Slot number	
Navigation	 Expert → Communication → HART input → Configuration → Slot number (7010)
Prerequisite	The Burst network option or the Master network option is selected in the Capture mode parameter (7001) (→  154).
Description	Use this function to enter the position of the process variable to be recorded in the burst command.
User entry	1 to 8
Factory setting	1

Additional information*User entry*

Slot	Command			
	1	3	9	
1	PV	PV	HART variable (slot 1)	HART variable (slot 1)
2	-	SV	HART variable (slot 2)	HART variable (slot 2)
3	-	TV	HART variable (slot 3)	HART variable (slot 3)
4	-	QV	HART variable (slot 4)	HART variable (slot 4)
5	-	-	HART variable (slot 5)	-
6	-	-	HART variable (slot 6)	-
7	-	-	HART variable (slot 7)	-
8	-	-	HART variable (slot 8)	-

Timeout**Navigation**

Expert → Communication → HART input → Configuration → Timeout (7005)

PrerequisiteThe **Burst network** option or the **Master network** option is selected in the **Capture mode** parameter (7001) (→ 154).**Description**

Use this function to enter the maximum permitted interval between two HART frames.

User entry

1 to 120 s

Factory setting

5 s

Additional information*Description*

If the interval is exceeded, the measuring device displays the **F882 Input signal** diagnostic message.

Failure mode**Navigation**

Expert → Communication → HART input → Configuration → Failure mode (7011)

PrerequisiteIn the **Capture mode** parameter (7001) (→ 154), the **Burst network** option or **Master network** option is selected.**Description**

Use this function to select the device behavior if no data are recorded within the maximum permitted interval.

Selection

- Alarm
- Last valid value
- Defined value

Factory setting

Alarm

Additional information*Options*

- **Alarm**
An error message is set.
- **Last valid value**
The last valid measured value is used.
- **Defined value**
A user-defined measured value is used: (**Failure value** parameter (7012) (→ 158)).

Failure value**Navigation**

Expert → Communication → HART input → Configuration → Failure value (7012)

Prerequisite

The following conditions are met:

- In the **Capture mode** parameter (7001) (→ 154), the **Burst network** option or **Master network** option is selected.
- In the **Failure mode** parameter (7011) (→ 157), the **Defined value** option is selected.

Description

Use this function to enter the measured value to be used if no data are recorded within the maximum permitted interval.

User entry

Signed floating-point number

Factory setting

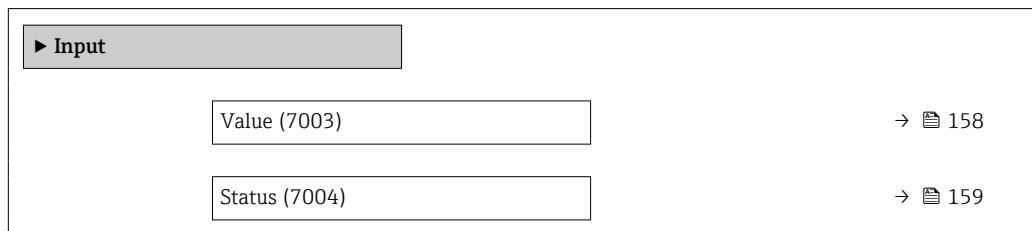
0

Additional information*Dependency*

The unit is taken from the **Pressure unit** parameter (0564) (→ 68)

"Input" submenu**Navigation**

Expert → Communication → HART input → Input

**Value****Navigation**

Expert → Communication → HART input → Input → Value (7003)

Description

Displays the value of the device variable recorded by the HART input.

User interface Signed floating-point number

Status

Navigation Expert → Communication → HART input → Input → Status (7004)

Description Displays the value of the device variable recorded by the HART input in accordance with the HART specification.

User interface

- Manual/Fixed
- Good
- Poor accuracy
- Bad

Additional information *Description*

If the measuring device reads in an invalid pressure measured value, the **F882 Input signal** diagnostic message is output

3.6.2 "HART output" submenu

Navigation Expert → Communication → HART output

► HART output	
► Configuration	→ 159
► Burst configuration	→ 161
► Information	→ 168
► Output	→ 171

"Configuration" submenu

Navigation Expert → Communication → HART output → Configuration

► Configuration	
HART short tag (0220)	→ 160
Device tag (0215)	→ 160
HART address (0219)	→ 160

No. of preambles (0217)	→ 161
Fieldbus writing access (0273)	→ 161

HART short tag



Navigation

Expert → Communication → HART output → Configuration → HART short tag (0220)

Description

Use this function to enter a brief description for the measuring point. This can be edited and displayed via HART protocol or using the local display.

User entry

Max. 8 characters: A to Z, 0 to 9 and certain special characters (e.g. punctuation marks, @, %).

Factory setting

PROSONIC

Device tag



Navigation

Expert → Communication → HART output → Configuration → Device tag (0215)

Description

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

User entry

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

Factory setting

Prosonic Flow

HART address



Navigation

Expert → Communication → HART output → Configuration → HART address (0219)

Description

Use this function to enter the address via which the data exchange takes place via HART protocol.

User entry

0 to 63

Factory setting

0

Additional information

Description

For addressing in a HART Multidrop network, the **Fixed current** option must be set in the **Current span** parameter (0353) (→ 110) (current output 1).

No. of preambles

Navigation	Expert → Communication → HART output → Configuration → No. of preambles (0217)
Description	Use this function to enter the number of preambles in the HART protocol.
User entry	2 to 20
Factory setting	5
Additional information	<p><i>User entry</i></p> <p>As every modem component can "swallow" a byte, 2-byte preambles at least must be defined.</p>

Fieldbus writing access

Navigation	Expert → Communication → HART output → Configuration → Fieldb.writ.acc. (0273)
Description	Use this function to restrict access to the measuring device via fieldbus (HART interface).
Selection	<ul style="list-style-type: none"> ■ Read + write ■ Read only
Factory setting	Read + write
Additional information	<p><i>Description</i></p> <p>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.</p> <p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Read + write The parameters are readable and writable. ■ Read only The parameters are only readable.

"Burst configuration 1 to n" submenu*Navigation*

Expert → Communication → HART output → Burst config.
→ Burst config. 1 to n

► Burst configuration 1 to n	
Burst mode 1 to n (2032-1 to n)	→ 162
Burst command 1 to n (2031-1 to n)	→ 163

Burst variable 0 (2033)	→ 164
Burst variable 1 (2034)	→ 165
Burst variable 2 (2035)	→ 165
Burst variable 3 (2036)	→ 165
Burst variable 4 (2037)	→ 165
Burst variable 5 (2038)	→ 166
Burst variable 6 (2039)	→ 166
Burst variable 7 (2040)	→ 166
Burst trigger mode (2044–1 to n)	→ 166
Burst trigger level (2043–1 to n)	→ 167
Min. update period (2042–1 to n)	→ 167
Max. update period (2041–1 to n)	→ 168

Burst mode 1 to n**Navigation**

Expert → Communication → HART output → Burst config. → Burst config. 1 to n
→ Burst mode 1 to n (2032–1 to n)

Description

Use this function to select whether to activate the HART burst mode for burst message X.

Selection

- Off
- On

Factory setting

Off

Additional information*Options*

- Off
The measuring device transmits data only when requested by the HART master.
- On
The measuring device transmits data regularly without being requested.

Burst command 1 to n

Navigation	Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst command 1 to n (2031–1 to n)
Description	Use this function to select the HART command that is sent to the HART master.
Selection	<ul style="list-style-type: none"> ■ Command 1 ■ Command 2 ■ Command 3 ■ Command 9 ■ Command 33 ■ Command 48
Factory setting	Command 2
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Command 1 Read out the primary variable. ■ Command 2 Read out the current and the main measured value as a percentage. ■ Command 3 Read out the dynamic HART variables and the current. ■ Command 9 Read out the dynamic HART variables including the related status. ■ Command 33 Read out the dynamic HART variables including the related unit. ■ Command 48 Read out the complete device diagnostics.

"Command 33" option

The HART device variables are defined via Command 107.

The following measured variables (HART device variables) can be read out:

- Volume flow
- Mass flow
- Temperature *
- Totalizer 1...3
- Sound velocity
- Flow velocity
- Acceptance rate *
- Turbulence *
- Signal strength *
- Signal to noise ratio *
- Percent of range
- Measured current
- Primary variable (PV)

* Visibility depends on order options or device settings

- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)

Commands



- Information about the defined details of the command: HART specifications
- The measured variables (HART device variables) are assigned to the dynamic variables in the **Output** submenu (→ 107).

Burst variable 0



Navigation

Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 0 (2033)

Description

For HART command 9 and 33: select the HART device variable or the process variable.

Selection

- Not used
- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity *
- Temperature *
- Pressure *
- Methane fraction *
- Molar mass *
- Density
- Dynamic viscosity *
- Calorific value *
- Wobbe index *
- Energy flow
- Electronics temperature *
- Signal strength *
- Signal to noise ratio *
- Acceptance rate *
- Turbulence
- Flow asymmetry *
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- HART input
- Percent of range
- Measured current
- Current input 1 *
- Current input 2 *
- Current input 3 *

Factory setting

Volume flow

* Visibility depends on order options or device settings

Additional information*Options*

If a burst message is not configured, the **Not used** option is set.

Burst variable 1**Navigation**

④⑤ Expert → Communication → HART output → Burst config. → Burst config. 1 to n
→ Burst variable 1 (2034)

Description

For HART command 9 and 33: select the HART device variable or the process variable.

Selection

See the **Burst variable 0** parameter (2033) (→ 164).

Factory setting

Not used

Burst variable 2**Navigation**

④⑤ Expert → Communication → HART output → Burst config. → Burst config. 1 to n
→ Burst variable 2 (2035)

Description

For HART command 9 and 33: select the HART device variable or the process variable.

Selection

See the **Burst variable 0** parameter (2033) (→ 164).

Factory setting

Not used

Burst variable 3**Navigation**

④⑤ Expert → Communication → HART output → Burst config. → Burst config. 1 to n
→ Burst variable 3 (2036)

Description

For HART command 9 and 33: select the HART device variable or the process variable.

Selection

See the **Burst variable 0** parameter (2033) (→ 164).

Factory setting

Not used

Burst variable 4**Navigation**

④⑤ Expert → Communication → HART output → Burst config. → Burst config. 1 to n
→ Burst variable 4 (2037)

Description

For HART command 9: select the HART device variable or the process variable.

Selection See the **Burst variable 0** parameter (2033) (→ 164).

Factory setting Not used

Burst variable 5



Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to n
→ Burst variable 5 (2038)

Description For HART command 9: select the HART device variable or the process variable.

Selection See the **Burst variable 0** parameter (2033) (→ 164).

Factory setting Not used

Burst variable 6



Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to n
→ Burst variable 6 (2039)

Description For HART command 9: select the HART device variable or the process variable.

Selection See the **Burst variable 0** parameter (2033) (→ 164).

Factory setting Not used

Burst variable 7



Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to n
→ Burst variable 7 (2040)

Description For HART command 9: select the HART device variable or the process variable.

Selection See the **Burst variable 0** parameter (2033) (→ 164).

Factory setting Not used

Burst trigger mode



Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to n
→ Trigger mode (2044-1 to n)

Description Use this function to select the event that triggers burst message X.

Selection	<ul style="list-style-type: none"> ■ Continuous ■ Window ■ Rising ■ Falling ■ On change
Factory setting	Continuous
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Continuous The message is sent continuously, at least at intervals corresponding to the time frame specified in the Burst min period parameter (2042) (→ 167). ■ Window The message is sent if the specified measured value has changed by the value in the Burst trigger level parameter (2043) (→ 167). ■ Rising The message is sent if the specified measured value exceeds the value in the Burst trigger level parameter (2043) (→ 167). ■ Falling The message is sent if the specified measured value drops below the value in the Burst trigger level parameter (2043) (→ 167). ■ On change The message is sent if a measured value changes in the burst message.

Burst trigger level

Navigation	Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Trigger level (2043–1 to n)
Description	For entering the burst trigger value.
User entry	Signed floating-point number
Additional information	<p><i>Description</i></p> <p>Together with the option selected in the Burst trigger mode parameter (2044) (→ 166) the burst trigger value determines the time of burst message X.</p>

Min. update period

Navigation	Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Min. upd. per. (2042–1 to n)
Description	Use this function to enter the minimum time span between two burst commands of burst message X.
User entry	Positive integer
Factory setting	1 000 ms

Max. update period**Navigation**

Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Max. upd. per. (2041–1 to n)

Description

Use this function to enter the maximum time span between two burst commands of burst message X.

User entry

Positive integer

Factory setting

2 000 ms

"Information" submenu*Navigation*

Expert → Communication → HART output → Information

▶ Information	
Device revision (0204)	→ 168
Device ID (0221)	→ 169
Device type (0209)	→ 169
Manufacturer ID (0259)	→ 169
HART revision (0205)	→ 170
HART descriptor (0212)	→ 170
HART message (0216)	→ 170
Hardware revision (0206)	→ 170
Software revision (0224)	→ 171
HART date code (0202)	→ 171

Device revision**Navigation**

Expert → Communication → HART output → Information → Device revision (0204)

Description

Displays the device revision with which the device is registered with the HART Communication Foundation.

User interface 2-digit hexadecimal number

Factory setting 0x3B

Additional information *Description*

 The device revision is needed to assign the appropriate device description file (DD) to the device.

Device ID

Navigation   Expert → Communication → HART output → Information → Device ID (0221)

Description Use this function to view the device ID for identifying the measuring device in a HART network.

User interface 6-digit hexadecimal number

Additional information *Description*

 In addition to the device type and manufacturer ID, the device ID is part of the unique ID. Each HART device is uniquely identified by the unique device ID.

Device type

Navigation   Expert → Communication → HART output → Information → Device type (0209)

Description Displays the device type with which the measuring device is registered with the HART Communication Foundation.

User interface 2-digit hexadecimal number

Factory setting 0x3B (for Prosonic Flow G 300/500)

Additional information *Description*

 The device type is specified by the manufacturer. It is needed to assign the appropriate device description file (DD) to the device.

Manufacturer ID

Navigation   Expert → Communication → HART output → Information → Manufacturer ID (0259)

Description Use this function to view the manufacturer ID with which the measuring device is registered with the HART Communication Foundation.

User interface 2-digit hexadecimal number

Factory setting 0x11 (for Endress+Hauser)

HART revision

Navigation  Expert → Communication → HART output → Information → HART revision (0205)

Description Use this function to display the HART protocol revision of the measuring device.

User interface 5 to 7

Factory setting 7

HART descriptor



Navigation  Expert → Communication → HART output → Information → HART descriptor (0212)

Description Use this function to enter a description for the measuring point. This can be edited and displayed via HART protocol or using the local display.

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

Factory setting Pros.Flow300/500

HART message



Navigation  Expert → Communication → HART output → Information → HART message (0216)

Description Use this function to enter a HART message which is sent via the HART protocol when requested by the master.

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

Factory setting Pros.Flow300/500

Hardware revision

Navigation  Expert → Communication → HART output → Information → Hardware rev. (0206)

Description Displays the hardware revision of the measuring device.

User interface 0 to 255

Factory setting 1

Software revision

Navigation	  Expert → Communication → HART output → Information → Software rev. (0224)
Description	Displays the software revision of the measuring device.
User interface	0 to 255
Factory setting	3

HART date code

Navigation	  Expert → Communication → HART output → Information → HART date code (0202)
Description	Use this function to enter the date information for individual use.
User entry	Date entry format: yyyy-mm-dd
Factory setting	2009-07-20
Additional information	<p><i>Example</i></p> <p>Device installation date</p>

"Output" submenu

Navigation   Expert → Communication → HART output → Output

► Output

Assign PV (0234)	→  172
Primary variable (PV) (0201)	→  172
Assign SV (0235)	→  173
Secondary variable (SV) (0226)	→  173
Assign TV (0236)	→  174
Tertiary variable (TV) (0228)	→  175
Assign QV (0237)	→  175
Quaternary variable (QV) (0203)	→  176

Assign PV**Navigation**

Expert → Communication → HART output → Output → Assign PV (0234)

Description

Use this function to select a measured variable (HART device variable) for the primary dynamic variable (PV).

Selection

- Off *
- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity *
- Temperature *
- Pressure *
- Methane fraction *
- Molar mass *
- Density
- Dynamic viscosity *
- Calorific value *
- Wobbe index *
- Energy flow
- Signal strength *
- Signal to noise ratio *
- Acceptance rate *
- Turbulence *
- Flow asymmetry *
- Electronics temperature

Factory setting

Volume flow

Primary variable (PV)**Navigation**

Expert → Communication → HART output → Output → Primary var (PV) (0201)

Description

Displays the current measured value of the primary dynamic variable (PV).

User interface

Signed floating-point number

Additional information*Display*

The measured value displayed depends on the process variable selected in the **Assign PV** parameter (0234) (→ 172).

Dependency

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

* Visibility depends on order options or device settings

Assign SV**Navigation**

Expert → Communication → HART output → Output → Assign SV (0235)

Description

Use this function to select a measured variable (HART device variable) for the secondary dynamic variable (SV).

Selection

- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity *
- Temperature *
- Pressure *
- Methane fraction *
- Molar mass *
- Density
- Dynamic viscosity *
- Calorific value *
- Wobbe index *
- Energy flow
- Signal strength *
- Signal to noise ratio *
- Acceptance rate *
- Turbulence *
- Flow asymmetry *
- Electronics temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Current input 1 *
- Current input 2 *
- Current input 3 *
- HART input

Factory setting

Totalizer 1

Secondary variable (SV)**Navigation**

Expert → Communication → HART output → Output → Second.var(SV) (0226)

Description

Displays the current measured value of the secondary dynamic variable (SV).

User interface

Signed floating-point number

* Visibility depends on order options or device settings

Additional information*Display*

The measured value displayed depends on the process variable selected in the **Assign SV** parameter (0235) (→ 173).

Dependency

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

Assign TV**Navigation**

 Expert → Communication → HART output → Output → Assign TV (0236)

Description

Use this function to select a measured variable (HART device variable) for the tertiary (third) dynamic variable (TV).

Selection

- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity *
- Temperature *
- Pressure *
- Methane fraction *
- Molar mass *
- Density
- Dynamic viscosity *
- Calorific value *
- Wobbe index *
- Energy flow
- Signal strength *
- Signal to noise ratio *
- Acceptance rate *
- Turbulence *
- Flow asymmetry *
- Electronics temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Current input 1 *
- Current input 2 *
- Current input 3 *
- HART input

Factory setting

Totalizer 2

* Visibility depends on order options or device settings

Tertiary variable (TV)

Navigation	  Expert → Communication → HART output → Output → Tertiary var(TV) (0228)
Description	Displays the current measured value of the tertiary dynamic variable (TV).
User interface	Signed floating-point number
Additional information	<p><i>Display</i></p> <p>The measured value displayed depends on the process variable selected in the Assign TV parameter (0236) (→  174).</p> <p><i>Dependency</i></p> <p> The unit of the displayed measured value is taken from the System units submenu (→  61).</p>

Assign QV

Navigation	  Expert → Communication → HART output → Output → Assign QV (0237)
Description	Use this function to select a measured variable (HART device variable) for the quaternary (fourth) dynamic variable (QV).
Selection	<ul style="list-style-type: none"> ▪ Volume flow ▪ Corrected volume flow ▪ Mass flow ▪ Flow velocity ▪ Sound velocity* ▪ Temperature* ▪ Pressure* ▪ Methane fraction* ▪ Molar mass* ▪ Density ▪ Dynamic viscosity* ▪ Calorific value* ▪ Wobbe index* ▪ Energy flow ▪ Signal strength* ▪ Signal to noise ratio* ▪ Acceptance rate* ▪ Turbulence* ▪ Flow asymmetry* ▪ Electronics temperature ▪ Totalizer 1 ▪ Totalizer 2 ▪ Totalizer 3 ▪ Current input 1* ▪ Current input 2* ▪ Current input 3* ▪ HART input

* Visibility depends on order options or device settings

Factory setting Totalizer 3

Quaternary variable (QV)

Navigation  Expert → Communication → HART output → Output → Quaternary.var(QV) (0203)

Description Displays the current measured value of the quaternary dynamic variable (QV).

User interface Signed floating-point number

Additional information *Display*

The measured value displayed depends on the process variable selected in the **Assign QV** parameter (0237) (→  175).

Dependency

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

3.6.3 "Web server" submenu

Navigation  Expert → Communication → Web server

 Web server	
Web server language (7221)	→  177
MAC address (7214)	→  177
DHCP client (7212)	→  177
IP address (7209)	→  178
Subnet mask (7211)	→  178
Default gateway (7210)	→  178
Web server functionality (7222)	→  179
Login page (7273)	→  179

Web server language

Navigation	  Expert → Communication → Web server → Webserv.language (7221)
Description	Use this function to select the language configured for the Web server.
Selection	<ul style="list-style-type: none"> ■ English ■ Deutsch ■ Français ■ Español ■ Italiano ■ Nederlands ■ Portuguesa ■ Polski ■ русский язык (Russian) ■ Svenska ■ Türkçe ■ 中文 (Chinese) ■ 日本語 (Japanese) ■ 한국어 (Korean) ■ tiếng Việt (Vietnamese) ■ čeština (Czech)
Factory setting	English

MAC address

Navigation	  Expert → Communication → Web server → MAC Address (7214)
Description	Displays the MAC ⁶⁾ 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.

6) Media Access Control

Selection	<ul style="list-style-type: none">▪ Off▪ On
Factory setting	On
Additional information	<p><i>Effect</i></p> <p>If the DHCP client functionality of the web server is selected, the IP address (7209) (→ 178), Subnet mask (7211) (→ 178) and Default gateway (7210) (→ 178) are set automatically.</p> <p> ▪ Identification is via the MAC address of the measuring device. ▪ The IP address (7209) (→ 178) in the IP address parameter (7209) (→ 178) is ignored as long as the DHCP client parameter (7212) (→ 177) is active. This is also the case, in particular, if the DHCP server cannot be reached. The IP address (7209) (→ 178) in the parameter of the same name is only used if the DHCP client parameter (7212) (→ 177) is inactive.</p>

IP address	
Navigation	 Expert → Communication → Web server → IP address (7209)
Description	Display or enter the IP address (7209) 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 (7210) (→ 178).
User entry	4 octet: 0 to 255 (in the particular octet)
Factory setting	0.0.0.0

Web server functionality

Navigation Expert → Communication → Web server → Webserver funct. (7222)

Description Use this function to switch the Web server on and off.

- Selection**
- Off
 - HTML Off
 - On

Factory setting On

Additional information *Description*

Once disabled, the Web server functionality (7222) can only be enabled again via the local display, the FieldCare operating tool or the DeviceCare operating tool.

Selection

Option	Description
Off	<ul style="list-style-type: none"> ▪ The Web server is completely disabled. ▪ Port 80 is locked.
HTML Off	The HTML version of the Web server is not available.
On	<ul style="list-style-type: none"> ▪ The complete Web server functionality 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

3.6.4 "Diagnostic configuration" submenu

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

Assign a category to the particular diagnostic event:

Category	Meaning
Failure (F)	A device error has occurred. The measured value is no longer valid.
Function check (C)	The device is in the service mode (e.g. during a simulation).

Category	Meaning
Out of specification (S)	The device is being operated: ▪ Outside its technical specification limits (e.g. outside the process temperature range) ▪ Outside of the configuration carried out by the user (e.g. maximum flow in parameter 20 mA value)
Maintenance required (M)	Maintenance is required. The measured value remains valid.
No effect (N)	Has no effect on the condensed status ¹⁾ .

1) Condensed status according to NAMUR recommendation NE 107

Navigation

Expert → Communication → Diag. config.

► Diagnostic configuration	
Event category 124 (0270)	→ 181
Event category 125 (0271)	→ 181
Event category 160 (0272)	→ 182
Event category 441 (0210)	→ 182
Event category 444 (0211)	→ 183
Event category 442 (0230)	→ 182
Event category 443 (0231)	→ 183
Event category 452 (0265)	→ 184
Event category 543 (0276)	→ 184
Event category 832 (0218)	→ 184
Event category 833 (0225)	→ 185
Event category 834 (0227)	→ 185
Event category 835 (0229)	→ 186
Event category 837 (0266)	→ 186
Event category 841 (0267)	→ 186
Event category 842 (0295)	→ 187
Event category 870 (0250)	→ 187

Event category 930 (0296)	→ 188
Event category 931 (0297)	→ 188
Event category 954 (0293)	→ 189

Event category 124 (Relative signal strength)

Navigation

Expert → Communication → Diag. config. → Event category 124 (0270)

Description

Use this function to select a category for the **124 Relative signal strength** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Maintenance required (M)

Additional information

For a detailed description of the event categories available for selection: → [179](#)

Event category 125 (Relative sound velocity)

Navigation

Expert → Communication → Diag. config. → Event category 125 (0271)

Description

Use this function to select a category for the **125 Relative sound velocity** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Maintenance required (M)

Additional information

For a detailed description of the event categories available for selection: → [179](#)

Event category 160 (Signal path switched off)**Navigation**

Expert → Communication → Diag. config. → Event category 160 (0272)

Description

Use this function to select a category for the **160 Signal path switched off** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Maintenance required (M)

Additional information

For a detailed description of the event categories available for selection: → [179](#)

Event category 441 (Current output 1 to n)**Navigation**

Expert → Communication → Diag. config. → Event category 441 (0210)

Description

Use this function to select a category for the **441 Current output 1 to n** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Out of specification (S)

Additional information

For a detailed description of the event categories available for selection: → [179](#)

Event category 442 (Frequency output 1 to n)**Navigation**

Expert → Communication → Diag. config. → Event category 442 (0230)

Prerequisite

The pulse/frequency/switch output is available.

Description

Use this function to select a category for the **442 Frequency output 1 to n** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting Out of specification (S)

Additional information  For a detailed description of the event categories available for selection: → [179](#)

Event category 443 (Pulse output 1 to n)

Navigation  Expert → Communication → Diag. config. → Event category 443 (0231)

Prerequisite The pulse/frequency/switch output is available.

Description Use this function to select a category for the **443 Pulse output 1 to n** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting Out of specification (S)

Additional information  For a detailed description of the event categories available for selection: → [179](#)

Event category 444 (Current input 1 to n)

Navigation  Expert → Communication → Diag. config. → Event category 444 (0211)

Prerequisite The current input is available.

Description Use this function to select a category for the **444 Current input 1 to n** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting Out of specification (S)

Additional information *Selection*

 For a detailed description of the event categories available for selection: → [179](#)

Event category 452 (Calculation error)**Navigation**

Expert → Communication → Diag. config. → Event category 452 (0265)

Description

Use this function to select a category for the **452 Calculation error** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Out of specification (S)

Additional information

For a detailed description of the event categories available for selection: → [179](#)

Event category 543 (Double pulse output)**Navigation**

Expert → Communication → Diag. config. → Event category 543 (0276)

Description

Use this option to select a category for the **543 Double pulse output** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Out of specification (S)

Additional information

For a detailed description of the event categories available for selection: → [179](#)

Event category 832 (Electronics temperature too high)**Navigation**

Expert → Communication → Diag. config. → Event category 832 (0218)

Description

Use this function to select a category for the **832 Electronics temperature too high** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Out of specification (S)

Additional information*Selection*For a detailed description of the event categories available for selection: → [179](#)**Event category 833 (Electronics temperature too low)****Navigation**

Expert → Communication → Diag. config. → Event category 833 (0225)

DescriptionUse this option to select a category for the **833 Electronics temperature too low** diagnostic message.**Selection**

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Out of specification (S)

Additional information*Selection*For a detailed description of the event categories available for selection: → [179](#)**Event category 834 (Process temperature too high)****Navigation**

Expert → Communication → Diag. config. → Event category 834 (0227)

DescriptionUse this option to select a category for the **834 Process temperature too high** diagnostic message.**Selection**

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Out of specification (S)

Additional information*Selection*For a detailed description of the event categories available for selection: → [179](#)

Event category 835 (Process temperature too low)**Navigation**

Expert → Communication → Diag. config. → Event category 835 (0229)

Description

Use this option to select a category for the **835 Process temperature too low** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Out of specification (S)

Additional information

Selection

For a detailed description of the event categories available for selection: → [179](#)

Event category 837 (Process pressure)**Navigation**

Expert → Communication → Diag. config. → Event category 837 (0266)

Description

Use this function to select a category for the **837 Process pressure** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Out of specification (S)

Additional information

For a detailed description of the event categories available for selection: → [179](#)

Event category 841 (Flow velocity too high)**Navigation**

Expert → Communication → Diag. config. → Event category 841 (0267)

Description

Use this function to assign a category to the **△S841 Flow velocity too high** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting Out of specification (S)

Additional information  For a detailed description of the event categories available for selection: → [179](#)

Event category 842 (Process limit)

Navigation  Expert → Communication → Diag. config. → Event category 842 (0295)

Description Use this function to assign a category to the **842 Process limit** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting Out of specification (S)

Additional information *Selection*

 For a detailed description of the event categories available for selection: → [179](#)

Event category 870 (Measuring inaccuracy increased)

Navigation  Expert → Communication → Diag. config. → Event category 870 (0250)

Description Use this function to select a category for the **870 Measuring inaccuracy increased** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting No effect (N)

Additional information *Selection*

 For a detailed description of the event categories available for selection: → [179](#)

Event category 881 (Sensor signal path 1 to n)**Navigation**

Expert → Communication → Diag. config. → Event category 881 (0268)

Description

Use this function to select a category for the **881 Sensor signal path 1 to n** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Failure (F)

Additional information

For a detailed description of the event categories available for selection: → 179

Event category 930 (Process fluid)**Navigation**

Expert → Communication → Diag. config. → Event category 930 (0296)

Description

Use this function to select a category for the **△S930 Process fluid** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Out of specification (S)

Additional information

Selection

For a detailed description of the event categories available for selection: → 179

Event category 931 (Process fluid)**Navigation**

Expert → Communication → Diag. config. → Event category 931 (0297)

Description

Use this function to select a category for the **△S931 Process fluid** diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Out of specification (S)

Additional information*Selection*For a detailed description of the event categories available for selection: → [179](#)**Event category 953 (Asymmetry noise signal too high path 1 to n)****Navigation**

Expert → Communication → Diag. config. → Event category 953 (0292)

DescriptionUse this function to select a category for the **△M953 Asymmetry noise signal too high path 1 to n** diagnostic message.**Selection**

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Failure (F)

Additional information*Selection*For a detailed description of the event categories available for selection: → [179](#)**Event category 954 (Sound velocity deviation too high)****Navigation**

Expert → Communication → Diag. config. → Event category 954 (0293)

DescriptionUse this function to select a category for the **△S954 Sound velocity deviation too high** diagnostic message.**Selection**

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting

Out of specification (S)

Additional information*Selection*For a detailed description of the event categories available for selection: → [179](#)

3.6.5 "WLAN settings" wizard

Navigation

Expert → Communication → WLAN settings

► WLAN settings	
WLAN (2702)	→ 191
WLAN mode (2717)	→ 191
SSID name (2714)	→ 191
Network security (2705)	→ 191
Security identification (2718)	→ 192
User name (2715)	→ 192
WLAN password (2716)	→ 193
WLAN IP address (2711)	→ 193
WLAN MAC address (2703)	→ 193
WLAN subnet mask (2709)	→ 193
WLAN MAC address (2703)	→ 193
WLAN passphrase (2706)	→ 194
WLAN MAC address (2703)	→ 193
Assign SSID name (2708)	→ 194
SSID name (2707)	→ 194
2.4 GHz WLAN channel (2704)	→ 195
Select antenna (2713)	→ 195
Connection state (2722)	→ 195
Received signal strength (2721)	→ 196
WLAN IP address (2711)	→ 193
Gateway IP address (2719)	→ 196
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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

- WLAN access point
- WLAN Client

Factory setting

WLAN 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	<ul style="list-style-type: none"> ■ Unsecured ■ WPA2-PSK ■ EAP-PEAP with MSCHAPv2 * ■ EAP-PEAP MSCHAPv2 no server authentic. * ■ EAP-TLS *
Factory setting	WPA2-PSK
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Unsecured Access the WLAN connection without identification. ■ WPA2-PSK Access the WLAN connection with a network key. ■ EAP-PEAP with MSCHAPv2 Access the WLAN connection with a password-based authentication protocol. ■ EAP-PEAP MSCHAPv2 no server authentic. Access the WLAN connection with a password-based protocol without server authentication. ■ EAP-TLS Access the WLAN connection with a certificate-based, two-way authentication of the client and network.

Security identification

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	<ul style="list-style-type: none"> ■ Trusted issuer certificate ■ Device certificate ■ Device private key

User name	
Navigation	  Expert → Communication → WLAN settings → User name (2715)
Description	Use this function to enter the username of the WLAN network.
User entry	–
Factory setting	–

* Visibility depends on order options or device settings

WLAN password

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

Description Use this function to enter the WLAN password for the WLAN network.

User entry –

Factory setting –

WLAN IP address

Navigation Expert → Communication → WLAN settings → WLAN IP address (2711)

Description Use this function to enter the IP address of the measuring device's WLAN connection.

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

Factory setting 192.168.1.212

WLAN MAC address

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

Description Displays the MAC⁷⁾ 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)

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)

7) Media Access Control

Factory setting 255.255.255.0

WLAN passphrase



Navigation Expert → Communication → WLAN settings → WLAN passphrase (2706)

Prerequisite The **WPA2-PSK** option is selected in the **Security type** parameter (2705) (→ [191](#)).

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)

Assign SSID name



Navigation Expert → Communication → WLAN settings → Assign SSID name (2708)

Description Use this function to select which name is used for the SSID⁸⁾.

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 (2708) (→ [194](#)).
- The **WLAN access point** option is selected in the **WLAN mode** parameter (2717) (→ [191](#)).

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

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

8) Service Set Identifier

Factory setting	EH_device designation_last 7 digits of the serial number (e.g. EH_Prosonic_Flow_500_A802000)
------------------------	-------------------------------------------------------------------------------------------------

2.4 GHz WLAN channel



Navigation Expert → Communication → WLAN settings → WLAN channel (2704)

Description Use this function to enter the 2.4 GHz WLAN channel (2704).

User entry 1 to 11

Factory setting 6

Additional information *Description*



- It is only necessary to enter a 2.4 GHz WLAN channel (2704) if multiple WLAN devices are in use.
- If just one measuring device is in use, it is recommended to keep the factory setting.

Select antenna



Navigation Expert → Communication → WLAN settings → Select antenna (2713)

Description Use this function to select whether the external or internal antenna is used for reception.

Selection

- External antenna
- Internal antenna

Factory setting Internal antenna

Connection state

Navigation Expert → Communication → WLAN settings → Connection state (2722)

Description The connection status is displayed.

User interface

- Connected
- Not connected

Factory setting Not connected

Received signal strength

Navigation	  Expert → Communication → WLAN settings → Rec.sig.strength (2721)
Description	Displays the signal strength received.
User interface	<ul style="list-style-type: none">■ Low■ Medium■ High
Factory setting	High

Gateway IP address

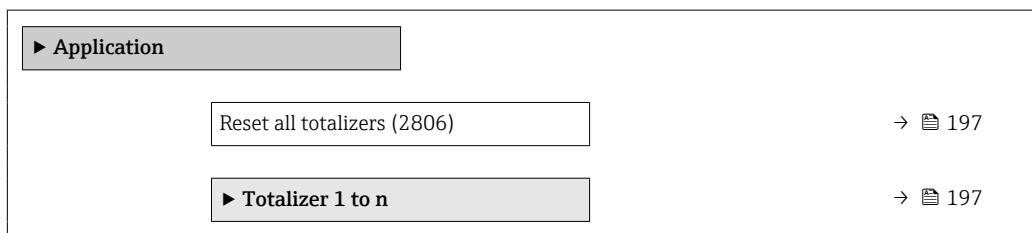
Navigation	  Expert → Communication → WLAN settings → Gateway IP addr. (2719)
Description	Use this function to enter the IP address of the gateway.
User interface	Character string comprising numbers, letters and special characters
Factory setting	192.168.1.212

IP address domain name server

Navigation	  Expert → Communication → WLAN settings → IP address DNS (2720)
Description	Use this function to enter the IP address of the domain name server.
User interface	Character string comprising numbers, letters and special characters
Factory setting	192.168.1.212

3.7 "Application" submenu

Navigation   Expert → Application



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

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

Selection

- Cancel
- Reset + totalize

Factory setting

Cancel

Additional information*Selection*

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

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

► Totalizer 1 to n

Assign process variable 1 to n (0914-1 to n)	→  197
Process variable unit 1 to n (0915-1 to n)	→  198
Totalizer 1 to n operation mode (0908-1 to n)	→  199
Control Totalizer 1 to n (0912-1 to n)	→  200
Preset value 1 to n (0913-1 to n)	→  201
Totalizer 1 to n failure behavior (0901-1 to n)	→  201

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

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

Selection

- Off
- Volume flow
- Corrected volume flow
- Mass flow
- Energy flow

Factory setting

Volume flow

Additional information*Description*

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

Options

If the **Off** option is selected, only the **Assign process variable** parameter (0914) (→ 197) is still displayed in the **Totalizer 1 to n** submenu. All other parameters in the submenu are hidden.

Process variable unit 1 to n**Navigation**

 Expert → Application → Totalizer 1 to n → VariableUnit 1 to n (0915–1 to n)

Prerequisite

A process variable is selected in the **Assign process variable** parameter (0914) (→ 197) of the **Totalizer 1 to n** submenu.

Description

Use this function to select the process variable unit for the Totalizer 1 to n (→ 197).

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 *
- 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

<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
■ Nl [*]	■ Sft ³ [*]	Sgal (imp) [*]
■ Nhl [*]	■ MSft ³ [*]	
■ Nm ³ [*]	■ MMSft ³ [*]	
■ Sl [*]	■ Sgal (us) [*]	
■ Sm ³ [*]	■ Sbbl (us;liq.) [*]	
	■ Sbbl (us;oil) [*]	

* Visibility depends on order options or device settings

or

<i>SI units</i>	<i>Imperial units</i>
■ kWh [*]	■ Btu [*]
■ MWh [*]	■ MBtu [*]
■ GWh [*]	■ MMBtu [*]
■ kJ [*]	
■ MJ [*]	
■ GJ [*]	
■ kcal [*]	
■ Mcal [*]	
■ Gcal [*]	

* Visibility depends on order options or device settings

or

Other units
None^{*}

* Visibility depends on order options or device settings

Factory setting

Depends on country:

- 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 (→ 61).

Options

The selection is dependent on the process variable selected in the **Assign process variable** parameter (0914) (→ 197).

Totalizer 1 to n operation mode



Navigation

Expert → Application → Totalizer 1 to n → Operat. mode 1 to n (0908–1 to n)

Prerequisite

A process variable is selected in the **Assign process variable** parameter (0914) (→ 197) of the **Totalizer 1 to n** submenu.

Description

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

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

Control Totalizer 1 to n

Navigation	 Expert → Application → Totalizer 1 to n → Control Tot. 1 to n (0912–1 to n)														
Prerequisite	A process variable is selected in the Assign process variable parameter (0914) (→  197) of the Totalizer 1 to n submenu.														
Description	Use this function to select the control of totalizer value 1-3.														
Selection	<ul style="list-style-type: none"> ■ Totalize ■ Reset + hold ■ Preset + hold ■ Reset + totalize ■ Preset + totalize ■ Hold 														
Factory setting	Totalize														
Additional information	<p><i>Selection</i></p> <table border="1" data-bbox="404 1477 1429 1830"> <thead> <tr> <th>Options</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Totalize</td> <td>The totalizer is started or continues running.</td> </tr> <tr> <td>Reset + hold</td> <td>The totaling process is stopped and the totalizer is reset to 0.</td> </tr> <tr> <td>Preset + hold¹⁾</td> <td>The totaling process is stopped and the totalizer is set to its defined start value from the Preset value parameter.</td> </tr> <tr> <td>Reset + totalize</td> <td>The totalizer is reset to 0 and the totaling process is restarted.</td> </tr> <tr> <td>Preset + totalize¹⁾</td> <td>The totalizer is set to the defined start value in the Preset value parameter and the totaling process is restarted.</td> </tr> <tr> <td>Hold</td> <td>Totalizing is stopped.</td> </tr> </tbody> </table>	Options	Description	Totalize	The totalizer is started or continues running.	Reset + hold	The totaling process is stopped and the totalizer is reset to 0.	Preset + hold ¹⁾	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 ¹⁾	The totalizer is set to the defined start value in the Preset value parameter and the totaling process is restarted.	Hold	Totalizing is stopped.
Options	Description														
Totalize	The totalizer is started or continues running.														
Reset + hold	The totaling process is stopped and the totalizer is reset to 0.														
Preset + hold ¹⁾	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 ¹⁾	The totalizer is set to the defined start value in the Preset value parameter and the totaling process is restarted.														
Hold	Totalizing is stopped.														

1) Visible depending on the order options or device settings

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 process variable parameter (0914) (→  197) 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	Depends on country: ■ 0 m ³ ■ 0 ft ³
Additional information	<i>User entry</i>  The unit of the selected process variable is defined in the Unit totalizer parameter (0915) (→  198) for the totalizer.
	<i>Example</i> This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.

Totalizer 1 to n failure behavior

Navigation	  Expert → Application → Totalizer 1 to n → FailureBehav. 1 to n (0901-1 to n)
Prerequisite	A process variable is selected in the Assign process variable parameter (0914) (→  197) 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">■ Hold■ Continue■ Last valid value + continue
Factory setting	Hold

Additional information**Description**

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

Selection

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

3.8 "Diagnostics" submenu

Navigation

Expert → Diagnostics

► Diagnostics	
Actual diagnostics (0691)	→ 203
Previous diagnostics (0690)	→ 204
Operating time from restart (0653)	→ 204
Operating time (0652)	→ 205
 ► Diagnostic list	→ 205
 ► Event logbook	→ 209
 ► Device information	→ 211
 ► Main electronic module + I/O module 1	→ 215
 ► Sensor electronic module (ISEM)	→ 216
 ► I/O module 2	→ 217
 ► I/O module 3	→ 218
 ► I/O module 4	→ 219
 ► Display module	→ 221

▶ Data logging	→ 222
▶ Heartbeat Technology	→ 230
▶ Simulation	→ 240

Actual diagnostics

Navigation

Expert → Diagnostics → Actual diagnos. (0691)

Prerequisite

A diagnostic event has occurred.

Description

Displays the current diagnostic message. If two or more messages occur simultaneously, the message with the highest priority is shown on the display.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

- Additional pending diagnostic messages can be viewed in the **Diagnostic list** submenu (→ 205).
- Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

Example

For the display format:

F271 Main electronic failure

Timestamp

Navigation

Expert → Diagnostics → Timestamp (0667)

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 diagnostics** parameter (0691) (→ 203).

Example

For the display format:

24d12h13m00s

Previous diagnostics

Navigation	  Expert → Diagnostics → Prev.diagnostics (0690)
Prerequisite	Two diagnostic events have already occurred.
Description	Displays the diagnostic message that occurred before the current message.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	<i>Display</i>  Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key. <i>Example</i> For the display format:  F271 Main electronic failure

Timestamp

Navigation	  Expert → Diagnostics → Timestamp (0672)
Description	Displays the operating time when the last diagnostic message before the current message occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<i>Display</i>  The diagnostic message can be viewed via the Previous diagnostics parameter (0690) (→  204). <i>Example</i> For the display format: 24d12h13m00s

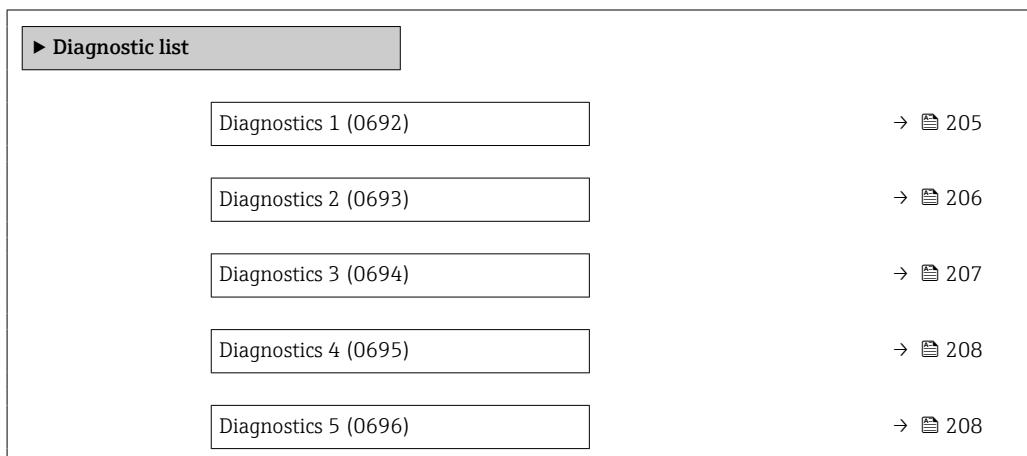
Operating time from restart

Navigation	  Expert → Diagnostics → Time fr. restart (0653)
Description	Use this function to display the time the device has been in operation since the last device restart.
User interface	Days (d), hours (h), minutes (m) and seconds (s)

Operating time

Navigation	  Expert → Diagnostics → Operating time (0652)
Description	Displays the length of time the device has been in operation.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<p><i>Indication</i></p> <p>Maximum number of days: 9 999 (corresponds to approx. 27 years and 5 months)</p>

3.8.1 "Diagnostic list" submenu

Navigation  Expert → Diagnostics → Diagnostic list

Diagnostics 1

Navigation	  Expert → Diagnostics → Diagnostic list → Diagnostics 1 (0692)
Description	Displays the current diagnostics message with the highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	<p><i>Display</i></p> <p> Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.</p>
<i>Examples</i>	<p>For the display format:</p> <ul style="list-style-type: none"> ▪  F271 Main electronic failure ▪  F276 I/O module failure

Timestamp 1

Navigation	  Expert → Diagnostics → Diagnostic list → Timestamp (0683)
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 (0692) (→  205). <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	<i>Display</i>  Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key. <i>Examples</i> For the display format: ■  F271 Main electronic failure ■  F276 I/O module failure

Timestamp 2

Navigation	  Expert → Diagnostics → Diagnostic list → Timestamp (0684)
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 (0693) (→ 206).

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 **Esc** key.

Examples

For the display format:

- **X**F271 Main electronic failure
- **X**F276 I/O module failure

Timestamp 3**Navigation**

Expert → Diagnostics → Diagnostic list → Timestamp (0685)

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 (0694) (→ 207).

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 electronic failure
-  F276 I/O module failure

Timestamp 4

Navigation

  Expert → Diagnostics → Diagnostic list → Timestamp (0686)

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 (0695) (→  208).

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 electronic failure
-  F276 I/O module failure

Timestamp 5**Navigation**

 Expert → Diagnostics → Diagnostic list → Timestamp (0687)

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 (0696) (→  208).

Example

For the display format:

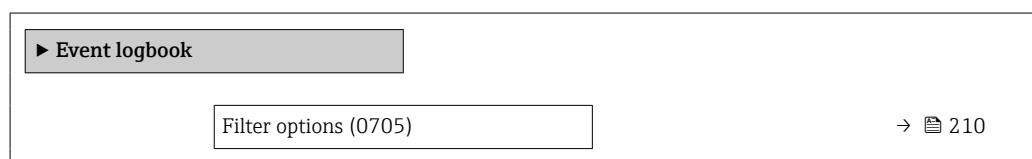
24d12h13m00s

3.8.2 "Event logbook" submenu**Viewing event messages**

Event messages are displayed in chronological order. The event history includes both diagnostic events and information events. The symbol in front of the timestamp indicates whether the event has started or ended.

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)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- Information (I)

Factory setting

All

Additional information*Description*

- The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:
- F = Failure
 - C = Function Check
 - S = Out of Specification
 - M = Maintenance Required

"Event list" submenu

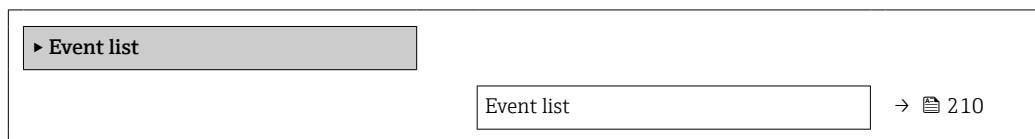
The **Event list** submenu is only displayed if operating via the local display.

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

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

Navigation

Expert → Diagnostics → Event logbook → Event list

**Event list****Navigation**

Expert → Diagnostics → Event logbook → Event list

Description

Displays the history of event messages of the category selected in the **Filter options** parameter (0705) (→ 210).

- 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	<i>Description</i>
	A maximum of 20 event messages are displayed in chronological order.
	If the Extended HistoROM application package (order option) is enabled in the device, the event list can contain up to 100 entries .
	The following symbols indicate whether an event has occurred or has ended:

- ⊖: Occurrence of the event
- ⊕: End of the event

Examples

For the display format:

- I1091 Configuration modified
⊖ 24d12h13m00s
- ✗F271 Main electronic failure
⊖ 01d04h12min30s

HistoROM

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

3.8.3 "Device information" submenu

Navigation

◀ ▶ Expert → Diagnostics → Device info

► Device information	
Device tag (0011)	→ 212
Serial number (0009)	→ 212
Firmware version (0010)	→ 213
Device name (0020)	→ 213
Order code (0008)	→ 213
Extended order code 1 (0023)	→ 214
Extended order code 2 (0021)	→ 214
Extended order code 3 (0022)	→ 214

Configuration counter (0233)	→ 214
ENP version (0012)	→ 215

Device tag

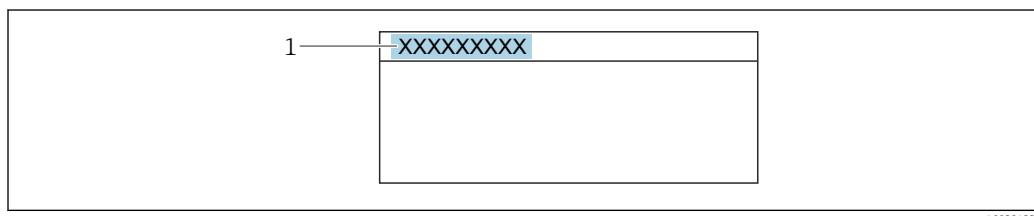
Navigation Expert → Diagnostics → Device info → Device tag (0011)

Description Displays a unique name for the measuring point so it can be identified quickly within the plant. It 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*



A0029422

1 Position of the header text on the display

The number of characters displayed depends on the characters used.

Serial number

Navigation Expert → Diagnostics → Device info → Serial number (0009)

Description Displays the serial number of the measuring device.

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

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

Additional information *Description*

Uses of the serial number

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

Firmware version

Navigation	  Expert → Diagnostics → Device info → Firmware version (0010)
Description	Displays the device firmware version installed.
User interface	Character string in the format xx.yy.zz
Additional information	<p><i>Display</i></p>  The Firmware version (0010) is also located: <ul style="list-style-type: none"> ▪ 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 500

Order code



Navigation	  Expert → Diagnostics → Device info → Order code (0008)
Description	Displays the device order code.
User interface	Character string composed of letters, numbers and certain punctuation marks (e.g. /).
Additional information	<p><i>Description</i></p>  The order code can be found on the nameplate of the sensor and transmitter in the "Order code" field.

The order code is generated from the extended order code through a process of reversible transformation. The extended order code indicates the attributes for all the device features in the product structure. The device features are not directly readable from the order code.

 **Uses of the order code**

- To order an identical spare device.
- To identify the device quickly and easily, e.g. when contacting Endress+Hauser.

Extended order code 1**Navigation**

Expert → Diagnostics → Device info → Ext. order cd. 1 (0023)

Description

Displays the first part of the extended order code.

On account of length restrictions, the extended order code is split into a maximum of 3 parameters.

User interface

Character string

Additional information**Description**

The extended order code indicates the version of all the features of the product structure for the measuring device and thus uniquely identifies the measuring device.

The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.

Extended order code 2**Navigation**

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

Description

Displays the second part of the extended order code.

User interface

Character string

Additional information

For additional information, see **Extended order code 1** parameter (0023) (→ 214)

Extended order code 3**Navigation**

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

Description

Displays the third part of the extended order code.

User interface

Character string

Additional information

For additional information, see **Extended order code 1** parameter (0023) (→ 214)

Configuration counter**Navigation**

Expert → Diagnostics → Device info → Config. counter (0233)

Description

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

User interface

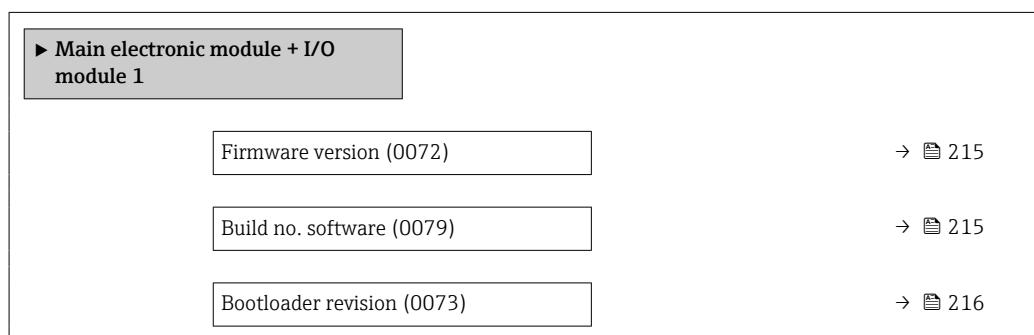
0 to 65 535

ENP version

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

3.8.4 "Main electronic module + I/O module 1" submenu

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

**Firmware version**

Navigation	  Expert → Diagnostics → Main elec.+I/O1 → Firmware version (0072)
Description	Use this function to display the software revision of the module.
User interface	Positive integer

Build no. software

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 revision

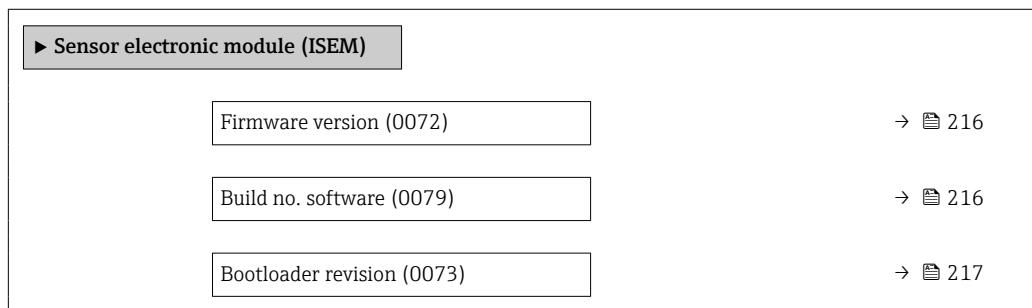
Navigation  Expert → Diagnostics → Main elec.+I/O1 → Bootloader rev. (0073)

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

User interface Positive integer

3.8.5 "Sensor electronic module (ISEM)" submenu

Navigation  Expert → Diagnostics → Sens. electronic



Firmware version

Navigation  Expert → Diagnostics → Sens. electronic → Firmware version (0072)

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

User interface Positive integer

Build no. software

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 revision

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

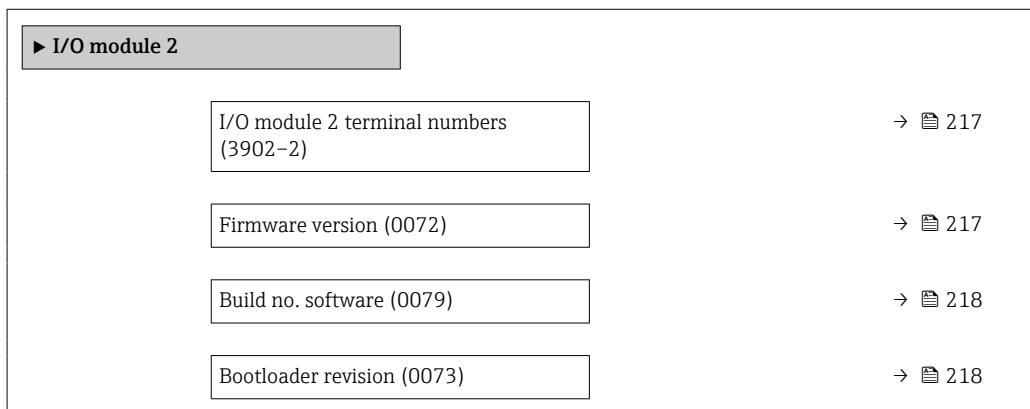
Description Use this function to display the bootloader revision of the software.

User interface Positive integer

3.8.6 "I/O module 2" submenu

Navigation

 Expert → Diagnostics → I/O module 2



I/O module 2 terminal numbers

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)
- 20-21 (I/O 4) *

Firmware version

Navigation  Expert → Diagnostics → I/O module 2 → Firmware version (0072)

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

* Visibility depends on order options or device settings

User interface Positive integer

Build no. software

Navigation  Expert → Diagnostics → I/O module 2 → Build no. softw. (0079)

Description Use this function to display the software build number of the module.

User interface Positive integer

Bootloader revision

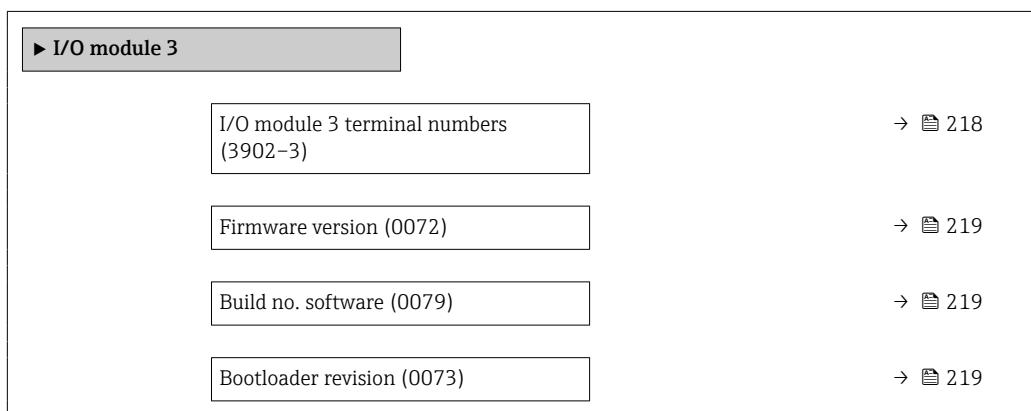
Navigation  Expert → Diagnostics → I/O module 2 → Bootloader rev. (0073)

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

User interface Positive integer

3.8.7 "I/O module 3" submenu

Navigation  Expert → Diagnostics → I/O module 3



I/O module 3 terminal numbers

Navigation  Expert → Diagnostics → I/O module 3 → I/O 3 terminals (3902-3)

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

User interface	<ul style="list-style-type: none"> ■ Not used ■ 26-27 (I/O 1) ■ 24-25 (I/O 2) ■ 22-23 (I/O 3) ■ 20-21 (I/O 4) *
-----------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------

Firmware version

Navigation	  Expert → Diagnostics → I/O module 3 → Firmware version (0072)
Description	Use this function to display the software revision of the module.
User interface	Positive integer

Build no. software

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

Bootloader revision

Navigation	  Expert → Diagnostics → I/O module 3 → 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 4" submenu

Navigation   Expert → Diagnostics → I/O module 4

▶ I/O module 4	I/O module 4 terminal numbers (3902-4)	→  220
----------------	-------------------------------------------	---------------------------------------------------------------------------------------------

* Visibility depends on order options or device settings

Firmware version (0072)	→ 220
Build no. software (0079)	→ 220
Bootloader revision (0073)	→ 220

I/O module 4 terminal numbers

Navigation Expert → Diagnostics → I/O module 4 → I/O 4 terminals (3902-4)

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

User interface

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

Firmware version

Navigation Expert → Diagnostics → I/O module 4 → Firmware version (0072)

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

User interface

Positive integer

Build no. software

Navigation Expert → Diagnostics → I/O module 4 → Build no. softw. (0079)

Description Use this function to display the software build number of the module.

User interface

Positive integer

Bootloader revision

Navigation Expert → Diagnostics → I/O module 4 → Bootloader rev. (0073)

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

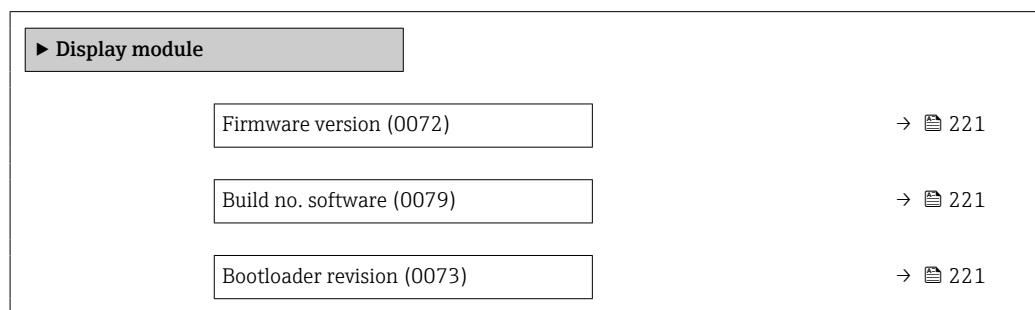
* Visibility depends on order options or device settings

User interface	Positive integer
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3.8.9 "Display module" submenu

Navigation

Expert → Diagnostics → Display module



Firmware version

Navigation

Expert → Diagnostics → Display module → Firmware version (0072)

Description

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

User interface

Positive integer

Build no. software

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 revision

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 channel 1 (0851)	→  222
Assign channel 2 (0852)	→  223
Assign channel 3 (0853)	→  224
Assign channel 4 (0854)	→  224
Logging interval (0856)	→  224
Clear logging data (0855)	→  225
Data logging (0860)	→  225
Logging delay (0859)	→  226
Data logging control (0857)	→  226
Data logging status (0858)	→  227
Entire logging duration (0861)	→  227

Assign channel 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 **Software option overview** parameter (0015) (→  43).

Description

Use this function to assign a process variable to the logging channel.

Selection

- Off
- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity*
- Temperature*
- Pressure*

* Visibility depends on order options or device settings

- Methane fraction *
- Molar mass *
- Density
- Current output 2 *
- Current output 3 *
- Current output 4 *
- Dynamic viscosity *
- Calorific value *
- Wobbe index *
- Energy flow
- Signal strength *
- Signal to noise ratio *
- Acceptance rate *
- Turbulence *
- Flow asymmetry *
- Electronics temperature
- Current output 1

Factory setting Off

Additional information *Description*

A total of 1000 measured values can be logged. This means:

- 1000 data points if 1 logging channel is used
- 500 data points if 2 logging channels are used
- 333 data points if 3 logging channels are used
- 250 data points if 4 logging channels are used

Once the maximum number of data points is reached, the oldest data points in the data log are cyclically overwritten in such a way that the last 1000, 500, 333 or 250 measured values are always in the log (ring memory principle).

 The log contents are cleared if the option selected is changed.

Assign channel 2



Navigation  Expert → Diagnostics → Data logging → Assign chan. 2 (0852)

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

 The software options currently enabled are displayed in the **Software option overview** parameter (0015) (→  43).

Description Use this function to select a process variable for the data logging channel.

Selection For the picklist, see **Assign channel 1** parameter (0851) (→  222)

Factory setting Off

* Visibility depends on order options or device settings

Assign channel 3



Navigation

Expert → Diagnostics → Data logging → Assign chan. 3 (0853)

Prerequisite

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

The software options currently enabled are displayed in the **Software option overview** parameter (0015) (→ 43).

Description

Use this function to select a process variable for the data logging channel.

Selection

For the picklist, see **Assign channel 1** parameter (0851) (→ 222)

Factory setting

Off

Assign channel 4



Navigation

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

Prerequisite

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

The software options currently enabled are displayed in the **Software option overview** parameter (0015) (→ 43).

Description

Use this function to select a process variable for the data logging channel.

Selection

For the picklist, see **Assign channel 1** parameter (0851) (→ 222)

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 **Software option overview** parameter (0015) (→ 43).

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:

- $T_{\log} = 1000 \times 1 \text{ s} = 1000 \text{ s} \approx 15 \text{ min}$
- $T_{\log} = 1000 \times 10 \text{ s} = 10000 \text{ s} \approx 3 \text{ h}$
- $T_{\log} = 1000 \times 80 \text{ s} = 80000 \text{ s} \approx 1 \text{ d}$
- $T_{\log} = 1000 \times 3600 \text{ s} = 3600000 \text{ s} \approx 41 \text{ d}$

Clear logging data**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 **Software option overview** parameter (0015) (→  43).

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	<i>Selection</i> <ul style="list-style-type: none">▪ 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 (0860) (→ 225), 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	<i>Description</i> Once data logging has been started with the Data logging control parameter (0857) (→ 226), the device does not save any data for the duration of the delay time entered.

Data logging control



Navigation	Expert → Diagnostics → Data logging → Data log.control (0857)
Prerequisite	In the Data logging parameter (0860) (→ 225), the Not overwriting option is selected.
Description	Use this function to start and stop measured value logging.
Selection	<ul style="list-style-type: none">▪ None▪ Delete + start▪ Stop
Factory setting	None
Additional information	<i>Selection</i> <ul style="list-style-type: none">▪ None Initial measured value logging status.▪ Delete + start All the measured values recorded for all the channels are deleted and measured value logging starts again.▪ Stop Measured value logging is stopped.

Data logging status

Navigation	 Expert → Diagnostics → Data logging → Data log. status (0858)
Prerequisite	In the Data logging parameter (0860) (→ 225), the Not overwriting option is selected.
Description	Displays the measured value logging status.
User interface	<ul style="list-style-type: none"> ■ Done ■ Delay active ■ Active ■ Stopped
Factory setting	Done
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Done Measured value logging has been performed and completed successfully. ■ Delay active Measured value logging has been started but the logging interval has not yet elapsed. ■ Active The logging interval has elapsed and measured value logging is active. ■ Stopped Measured value logging is stopped.

Entire logging duration

Navigation	 Expert → Diagnostics → Data logging → Logging duration (0861)
Prerequisite	In the Data logging parameter (0860) (→ 225), the Not overwriting option is selected.
Description	Displays the total logging duration.
User interface	Positive floating-point number
Factory setting	0 s

"Display channel 1" submenu

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



Display channel 1

Navigation

  Expert → Diagnostics → Data logging → Displ.channel 1

Prerequisite

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

 The software options currently enabled are displayed in the **Software option overview** parameter (0015) (→  43).

One of the following options is selected in the **Assign channel 1** parameter (0851) (→  222):

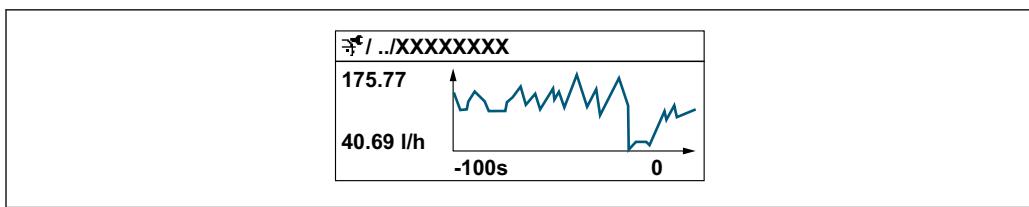
- Off
- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity*
- Temperature*
- Pressure*
- Density
- Current output 2*
- Current output 3*
- Energy flow
- Signal strength*
- Signal to noise ratio*
- Acceptance rate*
- Turbulence*
- Electronics temperature
- Current output 1

Description

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

Additional information

Description



A0034352

 10 Chart of a measured value trend

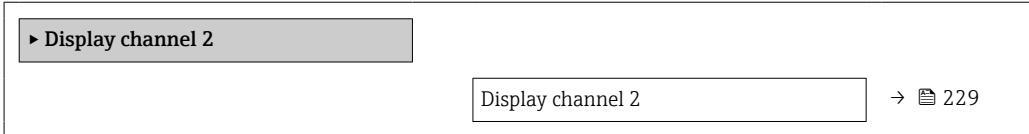
- x-axis: depending on the number of channels selected displays 250 to 1000 measured values of a process variable.
- y-axis: displays the approximate measured value span and constantly adapts this to the ongoing measurement.

* Visibility depends on order options or device settings

"Display 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 specified in the **Assign channel 2** parameter (0851).

Description

See the **Display channel 1** parameter → 228

"Display 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 specified in the **Assign channel 3** parameter (0851).

Description

See the **Display channel 1** parameter → 228

"Display channel 4" submenu

Navigation

Expert → Diagnostics → Data logging → Displ.channel 4



Display channel 4

Navigation

Expert → Diagnostics → Data logging → Displ.channel 4

Prerequisite

A process variable is specified in the **Assign channel 4** parameter (0851).

Description

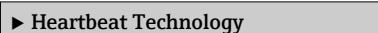
See the **Display channel 1** parameter → 228

3.8.11 "Heartbeat Technology" submenu

 For detailed information on the parameter descriptions for the **Heartbeat Verification+Monitoring**: Special Documentation for the device → 7

Navigation

Expert → Diagnostics → Heartbeat Techn.



▶ Heartbeat Technology

"Heartbeat base settings" submenu

Navigation

Expert → Diagnostics → Heartbeat Techn. → Base settings



▶ Heartbeat base settings

Plant operator (2754)

→ 230

Location (2755)

→ 230

Plant operator

**Navigation**

Expert → Diagnostics → Heartbeat Techn. → Base settings → Plant operator (2754)

Description

Use this function to enter the plant operator.

User entry

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

Location

**Navigation**

Expert → Diagnostics → Heartbeat Techn. → Base settings → Location (2755)

Description

Use this function to enter the location.

User entry

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

"Performing verification" wizard*Navigation*
 Expert → Diagnostics → Heartbeat Techn. → Perform.verific.

► Performing verification	
Year (2846)	→  231
Month (2845)	→  232
Day (2842)	→  232
Hour (2843)	→  232
AM/PM (2813)	→  233
Minute (2844)	→  233
Verification mode (12105)	→  233
External device information (12101)	→  234
Start verification (12127)	→  234
Progress (2808)	→  235
Measured values (12102)	→  235
Output values (12103)	→  236
Status (12153)	→  236
Verification result (12149)	→  236

Year**Navigation**
 Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → Year (2846)
Prerequisite
 Can be edited if Heartbeat Verification is not active.
Description

Use this function to enter the year of recalibration.

User entry 9 to 99

Factory setting 21

Month



Navigation Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → Month (2845)

Prerequisite Can be edited if Heartbeat Verification is not active.

Description Use this function to select the month of recalibration.

Selection

- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Factory setting January

Day



Navigation Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → Day (2842)

Prerequisite Can be edited if Heartbeat Verification is not active.

Description Use this function to enter the day of the month of recalibration.

User entry 1 to 31 d

Factory setting 1 d

Hour



Navigation Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → Hour (2843)

Prerequisite Can be edited if Heartbeat Verification is not active.

Description Use this function to enter the hour of recalibration.

User entry 0 to 23 h

Factory setting 12 h

AM/PM



Navigation Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → AM/PM (2813)

Prerequisite Can be edited if Heartbeat Verification is not active.

The **dd.mm.yy hh:mm am/pm** option or the **mm/dd/yy hh:mm am/pm** option is selected in the **Date/time format** parameter (2812) (→ 71).

Description Use this function to select the time entry in the morning (**AM** option) or afternoon (**PM** option) in the case of 12-hour notation.

Selection

- AM
- PM

Factory setting AM

Minute



Navigation Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → Minute (2844)

Prerequisite Can be edited if Heartbeat Verification is not active.

Description Use this function to enter the minutes of recalibration.

User entry 0 to 59 min

Factory setting 0 min

Verification mode



Navigation Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → Verificat. mode (12105)

Prerequisite Can be edited if verification status is not active.

Description Select verification mode.

Standard verification: Verification is performed automatically by the device and without manual checking of external measured variables.

Extended verification: Similar to internal verification but with the entry of external measured variables (see also "Measured values" parameter).

Selection

- Standard verification
- Extended verification

Factory setting

Standard verification

External device information**Navigation**

Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → Ext. device info (12101)

Prerequisite

With the following conditions:

- The **Extended verification** option is selected in the **Verification mode** parameter (12105) (→ 233).
- Can be edited if Heartbeat Verification is not active.

Description

Record measuring equipment for extended verification.

User entry

Free text entry

Factory setting

-

Start verification**Navigation**

Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → Start verificat. (12127)

Description

Start the verification.

To carry out a complete verification, select the selection parameters individually. Once the external measured values have been recorded, verification is started using the **Start** option.

Selection

- Cancel
- Output 1 low value *
- Output 1 high value *
- Output 2 low value *
- Output 2 high value *
- Output 3 low value *
- Output 3 high value *
- Output 4 low value *
- Output 4 high value *
- Frequency output 1 *
- Pulse output 1 *
- Frequency output 2 *
- Pulse output 2 *

* Visibility depends on order options or device settings

- Frequency output 3 *
- Double pulse output *
- Start

Factory setting Cancel

Progress

Navigation	  Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → Progress (2808)
Description	The progress of the process is indicated.
User interface	0 to 100 %

Measured values



Navigation	  Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → Measured val. (12102)
Prerequisite	<p>One of the following options is selected in the Start verification parameter (12127) (→  234):</p> <ul style="list-style-type: none"> ■ Output 1 low value ■ Output 1 high value ■ Output 2 low value ■ Output 2 high value ■ Output 3 low value ■ Output 3 high value ■ Output 4 low value ■ Output 4 high value ■ Frequency output 1 ■ Pulse output 1 ■ Frequency output 2 ■ Pulse output 2 ■ Frequency output 3 ■ Double pulse output
Description	<p>Use this function to enter the measured values (actual values) for the external measured variables:</p> <ul style="list-style-type: none"> ■ Current output: Output current in [mA] ■ Pulse/frequency output: Output frequency in [Hz] ■ Double pulse output: Output frequency in [Hz]
User entry	Signed floating-point number
Factory setting	0

* Visibility depends on order options or device settings

Output values

Navigation	 Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → Output values (12103)
Description	Displays the simulated output values (target values) for the external measured variables: <ul style="list-style-type: none">▪ Current output: Output current in [mA].▪ Pulse/frequency output: Output frequency in [Hz].
User interface	Signed floating-point number
Factory setting	-

Status

Navigation	 Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → Status (12153)
Description	Displays the current status of the verification.
User interface	<ul style="list-style-type: none">▪ Done▪ Busy▪ Failed▪ Not done

Verification result

Navigation	 Expert → Diagnostics → Heartbeat Techn. → Perform.verific. → Verific. result (12149)
Description	Displays the overall result of the verification.  Detailed description of results classification:
User interface	<ul style="list-style-type: none">▪ Not supported▪ Passed▪ Not done▪ Failed

"Verification results" submenu

Navigation  Expert → Diagnostics → Heartbeat Techn. → Verific. results

 **Verification results**

Date/time (manually entered) (12142)	→ 237
Verification ID (12141)	→ 237
Operating time (12126)	→ 238
Verification result (12149)	→ 238
Sensor (12152)	→ 238
Sensor electronic module (ISEM) (12151)	→ 239
I/O module (12145)	→ 239
System status (12109)	→ 239

Date/time (manually entered)

Navigation	Expert → Diagnostics → Heartbeat Techn. → Verific. results → Date/time (12142)
Prerequisite	The verification has been performed.
Description	Date and time.
User interface	dd.mmmm.yyyy; hh:mm
Factory setting	1 January 2010; 12:00

Verification ID

Navigation	Expert → Diagnostics → Heartbeat Techn. → Verific. results → Verification ID (12141)
Prerequisite	The verification has been performed.
Description	Displays consecutive numbering of the verification results in the measuring device.
User interface	0 to 65 535
Factory setting	0

Operating time

Navigation	  Expert → Diagnostics → Heartbeat Techn. → Verific. results → Operating time (12126)
Prerequisite	The verification has been performed.
Description	Indicates how long the device has been in operation up to the verification.
User interface	Days (d), hours (h), minutes (m), seconds (s)
Factory setting	–

Verification result

Navigation	  Expert → Diagnostics → Heartbeat Techn. → Verific. results → Verific. result (12149)
Description	Displays the overall result of the verification.  Detailed description of results classification:
User interface	<ul style="list-style-type: none">■ Not supported■ Passed■ Not done■ Failed

Sensor

Navigation	  Expert → Diagnostics → Heartbeat Techn. → Verific. results → Sensor (12152)
Prerequisite	The Failed option is shown in the Overall result parameter (12149) (→  236).
Description	Displays the result for the sensor.  Detailed description of results classification:
User interface	<ul style="list-style-type: none">■ Not supported■ Passed■ Not done■ Failed
Factory setting	Not done

Sensor electronic module (ISEM)

Navigation	  Expert → Diagnostics → Heartbeat Techn. → Verific. results → Sens. electronic (12151)
Prerequisite	The Failed option is shown in the Overall result parameter (12149) (→ 236).
Description	Displays the result for the sensor electronics module (ISEM).  Detailed description of results classification:
User interface	<ul style="list-style-type: none">■ Not supported■ Passed■ Not done■ Failed
Factory setting	Not done

I/O module

Navigation	  Expert → Diagnostics → Heartbeat Techn. → Verific. results → I/O module (12145)
Prerequisite	The Failed option is shown in the Overall result parameter (12149) (→ 236).
Description	Displays the result for I/O module monitoring of the I/O module. <ul style="list-style-type: none">■ For current output: Accuracy of the current■ For pulse output: Accuracy of pulses■ For frequency output: Accuracy of frequency■ Current input: Accuracy of the current■ Double pulse output: Accuracy of the pulses■ Relay output: Number of switching cycles  Detailed description of results classification:
User interface	<ul style="list-style-type: none">■ Not supported■ Passed■ Not done■ Not plugged■ Failed
Factory setting	Not done

System status

Navigation	  Expert → Diagnostics → Heartbeat Techn. → Verific. results → System status (12109)
Prerequisite	The Failed option is shown in the Overall result parameter (12149) (→ 236).

Description Displays the system condition. Tests the measuring device for active errors.

 Detailed description of results classification:

User interface

- Not supported
- Passed
- Not done
- Failed

Factory setting Not done

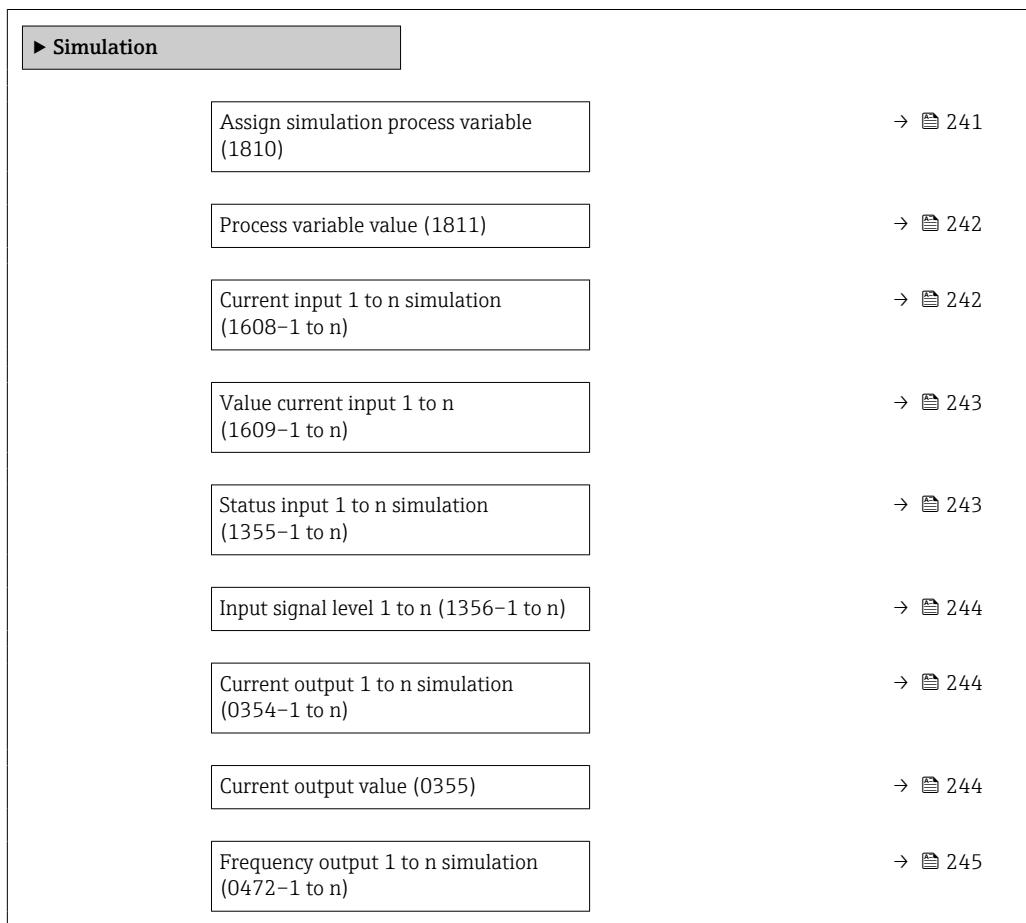
"Monitoring results" submenu

Navigation  Expert → Diagnostics → Heartbeat Techn. → Monitor, results



3.8.12 "Simulation" submenu

Navigation  Expert → Diagnostics → Simulation



Frequency output 1 to n value (0473-1 to n)	→ 245
Pulse output simulation 1 to n (0458-1 to n)	→ 246
Pulse value 1 to n (0459-1 to n)	→ 246
Switch output simulation 1 to n (0462-1 to n)	→ 246
Switch state 1 to n (0463-1 to n)	→ 247
Relay output 1 to n simulation (0802-1 to n)	→ 247
Switch state 1 to n (0803-1 to n)	→ 248
Pulse output simulation (0988)	→ 248
Pulse value (0989)	→ 249
Device alarm simulation (0654)	→ 249
Diagnostic event category (0738)	→ 250
Diagnostic event simulation (0737)	→ 250

Assign simulation process variable



Navigation

Expert → Diagnostics → Simulation → Assign proc.var. (1810)

Description

Use this function to select a process variable for the simulation process that is activated. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- Volume flow
- Corrected volume flow
- Mass flow
- Flow velocity
- Sound velocity *
- Temperature *
- Pressure *
- Methane fraction *
- Molar mass *
- Density
- Dynamic viscosity *

* Visibility depends on order options or device settings

- Calorific value *
- Wobbe index *
- Energy flow

Factory setting Off

Additional information *Description*

-  The simulation value of the process variable selected is defined in the **Process variable value** parameter (1811) (→ 242).

Process variable value



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

Prerequisite A process variable is selected in the **Assign simulation process variable** parameter (1810) (→ 241).

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

User entry Depends on the process variable selected

Factory setting 0

Additional information *User entry*

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

Current input 1 to n simulation



Navigation  Expert → Diagnostics → Simulation → Curr.inp 1 to n sim. (1608-1 to n)

Description Option for switching simulation of the current input on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

-  The desired simulation value is defined in the **Value current input 1 to n** parameter (1609-1 to n).

Selection

- Off
- On

Factory setting Off

* Visibility depends on order options or device settings

Additional information*Selection*

■ Off

Current simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.

■ On

Current simulation is active.

Value current input 1 to n**Navigation**

Expert → Diagnostics → Simulation → Value curr.inp 1 to n (1609–1 to n)

Prerequisite

In the **Current input 1 to n simulation** parameter (1608–1 to n), 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

Status input 1 to n simulation**Navigation**

Expert → Diagnostics → Simulation → Status inp 1 to n sim (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.

Selection

■ Off

■ On

Factory setting

Off

Additional information*Description*

The desired simulation value is defined in the **Input signal level** parameter (1356) (→ 244).

Selection

■ Off

Simulation for the status input is switched off. The device is in normal measuring mode or another process variable is being simulated.

■ On

Simulation for the status input is active.

Input signal level 1 to n**Navigation**

Expert → Diagnostics → Simulation → Signal level 1 to n (1356–1 to n)

Prerequisite

In the **Status input simulation** parameter (1355) (→ 243), the **On** option is selected.

Description

Use this function to select the signal level for the simulation of the status input. In this way, users can verify the correct configuration of the status input and the correct function of upstream feed-in units.

Selection

- High
- Low

Current output 1 to n simulation**Navigation**

Expert → Diagnostics → Simulation → Curr.outp 1 to n sim. (0354–1 to n)

Description

Use this function to switch simulation of the current output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting

Off

Additional information**Description**

The desired simulation value is defined in the **Value current output 1 to n** parameter (0355–1 to n).

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.

Current output value**Navigation**

Expert → Diagnostics → Simulation → Curr.outp val. (0355)

Prerequisite

In the **Current output 1 to n simulation** parameter (0354–1 to n), 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 (0353) (→ 110).

Frequency output 1 to n simulation



Navigation Expert → Diagnostics → Simulation → Freq.outp 1 to n sim. (0472-1 to n)

Prerequisite In the **Operating mode** parameter (0469) (→ 123), the **Frequency** option is selected.

Description Use this function to switch simulation of the frequency output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting Off

Additional information *Description*

The desired simulation value is defined in the **Frequency value 1 to n** parameter (0473-1 to n).

Selection

- Off
Frequency simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
Frequency simulation is active.

Frequency output 1 to n value



Navigation Expert → Diagnostics → Simulation → Freq.outp 1 to n val. (0473-1 to n)

Prerequisite In the **Frequency simulation 1 to n** parameter (0472-1 to n), the **On** option is selected.

Description Use this function to enter a frequency value for the simulation. In this way, users can verify the correct adjustment of the frequency output and the correct function of downstream switching units.

User entry 0.0 to 12 500.0 Hz

Pulse output simulation 1 to n**Navigation**

Expert → Diagnostics → Simulation → Puls.outp.sim. 1 to n (0458–1 to n)

Prerequisite

In the **Operating mode** parameter (0469) (→ 123), the **Pulse** option is selected.

Description

Use this function to switch simulation of the pulse output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- Fixed value
- Down-counting value

Factory setting

Off

Additional information*Description*

The desired simulation value is defined in the **Pulse value 1 to n** parameter (0459–1 to n).

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 (0452) (→ 126).
- Down-counting value
The pulses specified in the **Pulse value** parameter (0459) (→ 246) are output.

Pulse value 1 to n**Navigation**

Expert → Diagnostics → Simulation → Pulse value 1 to n (0459–1 to n)

Prerequisite

In the **Pulse output simulation 1 to n** parameter (0458–1 to n), the **Down-counting value** option is selected.

Description

Use this function to enter a pulse value for the simulation. In this way, users can verify the correct adjustment of the pulse output and the correct function of downstream switching units.

User entry

0 to 65 535

Switch output simulation 1 to n**Navigation**

Expert → Diagnostics → Simulation → Switch sim. 1 to n (0462–1 to n)

Prerequisite

In the **Operating mode** parameter (0469) (→ 123), 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	<ul style="list-style-type: none"> ▪ Off ▪ On
Factory setting	Off
Additional information	<p><i>Description</i></p> <p> The desired simulation value is defined in the Switch state 1 to n parameter (0463–1 to n).</p> <p><i>Selection</i></p> <ul style="list-style-type: none"> ▪ 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 state 1 to n



Navigation	 Expert → Diagnostics → Simulation → Switch state 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	<ul style="list-style-type: none"> ▪ Open ▪ Closed
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ▪ Open Switch simulation is switched off. The device is in normal measuring mode or another process variable is being simulated. ▪ Closed Switch simulation is active.

Relay output 1 to n simulation



Navigation	 Expert → Diagnostics → Simulation → Relay out. 1 to n sim (0802–1 to n)
Description	Use this function to switch simulation of the relay output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.
Selection	<ul style="list-style-type: none"> ▪ Off ▪ On

Factory setting Off

Additional information *Description*

 The desired simulation value is defined in the **Switch state 1 to n** parameter (0803-1 to n).

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 state 1 to n



Navigation

  Expert → Diagnostics → Simulation → Switch state 1 to n (0803-1 to n)

Prerequisite

The **On** option is selected in the **Switch output simulation 1 to n** parameter (0802-1 to n) 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.

Pulse output simulation



Navigation

  Expert → Diagnostics → Simulation → Puls.outp.sim. (0988)

Description

Use this function to switch simulation of the double pulse output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- Fixed value
- Down-counting value

Factory setting Off

Additional information*Description*

The desired simulation value is defined in the **Pulse value** parameter (0989) (→ 249).

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 (0986) (→ 150).

- Down-counting value

The pulses specified in the **Pulse value** parameter (0989) (→ 249) are output.

Pulse value**Navigation**

Expert → Diagnostics → Simulation → Pulse value (0989)

Prerequisite

In the **Pulse output simulation** parameter (0988) (→ 248), the **Down-counting value** option is selected.

Description

Use this function to enter a pulse value for simulation of the double pulse output. In this way, users can verify the correct adjustment of the double pulse output and the correct function of downstream switching units.

User entry

0 to 65 535

Device alarm simulation**Navigation**

Expert → Diagnostics → Simulation → Dev. alarm sim. (0654)

Description

Use this function to switch the device alarm on and off.

Selection

- Off
- On

Factory setting

Off

Additional information*Description*

The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Diagnostic event category**Navigation**

Expert → Diagnostics → Simulation → Event category (0738)

Description

Use this function to select the category of the diagnostic events that are displayed for the simulation in the **Diagnostic event simulation** parameter (0737) (→ 250).

Selection

- Sensor
- Electronics
- Configuration
- Process

Factory setting

Process

Diagnostic event simulation**Navigation**

Expert → Diagnostics → Simulation → Diagnostic event (0737)

Description

Use this function to select a diagnostic event for the simulation process that is activated.

Selection

- Off
- Diagnostic event picklist (depends on the category selected)

Factory setting

Off

Additional information**Description**

For the simulation, you can choose from the diagnostic events of the category selected in the **Diagnostic event category** parameter (0738) (→ 250).

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	bar

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

Output	Current range
Current output 1...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

4.2.2 Full scale values

 The factory settings apply to the following parameters:

- 20 mA value (full scale value of the current output)
- 100% bar graph value 1

Nominal diameter [in]	[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

Output	Current range
Current output 1...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

 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)

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