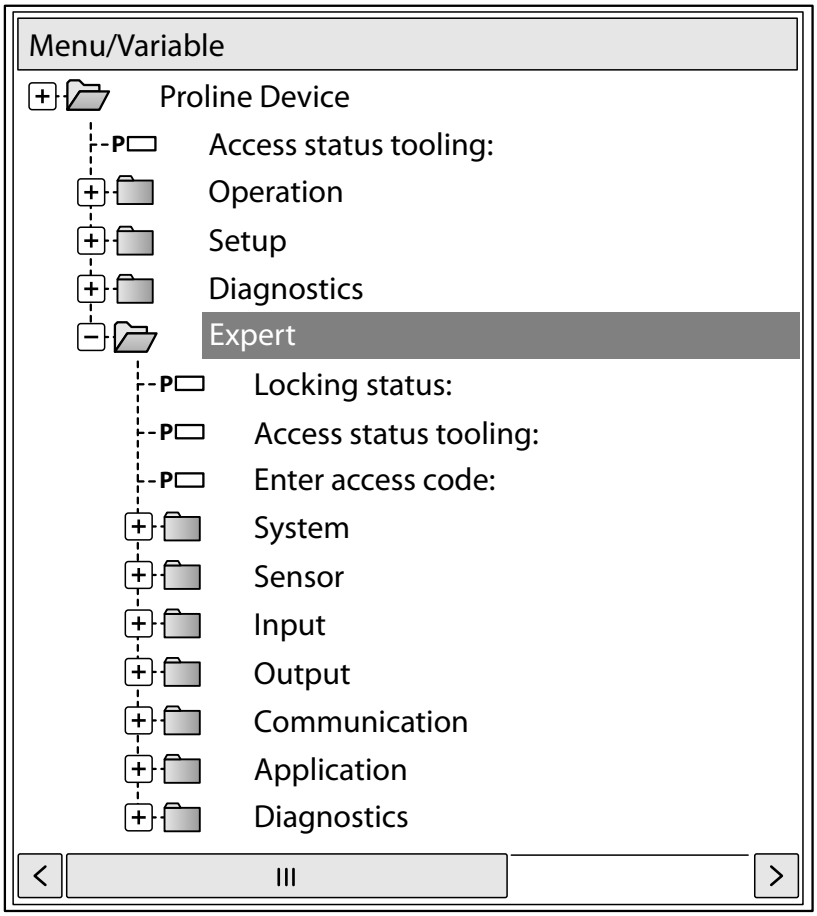
GP01012D/06/EN/03.15
71280334

Valid as of version
01.02.zz (Device firmware)

Description of Device Parameters
Proline Prosonic Flow 200
HART

Ultrasonic time-of-flight flowmeter



Endress+Hauser
People for Process Automation

Table of contents

1 Document information

1.1 Document function

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

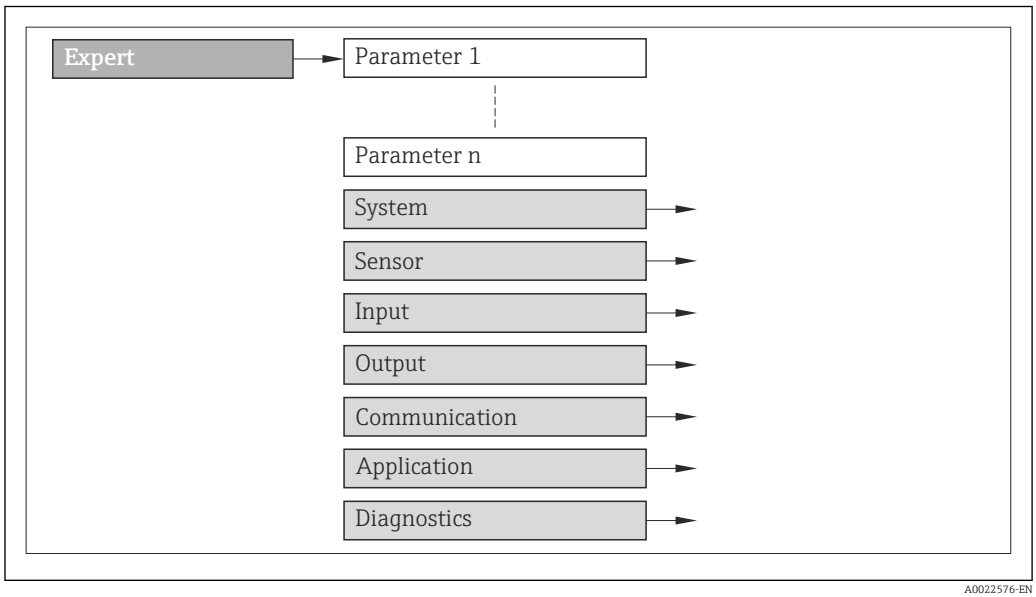
1.2 Target group

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

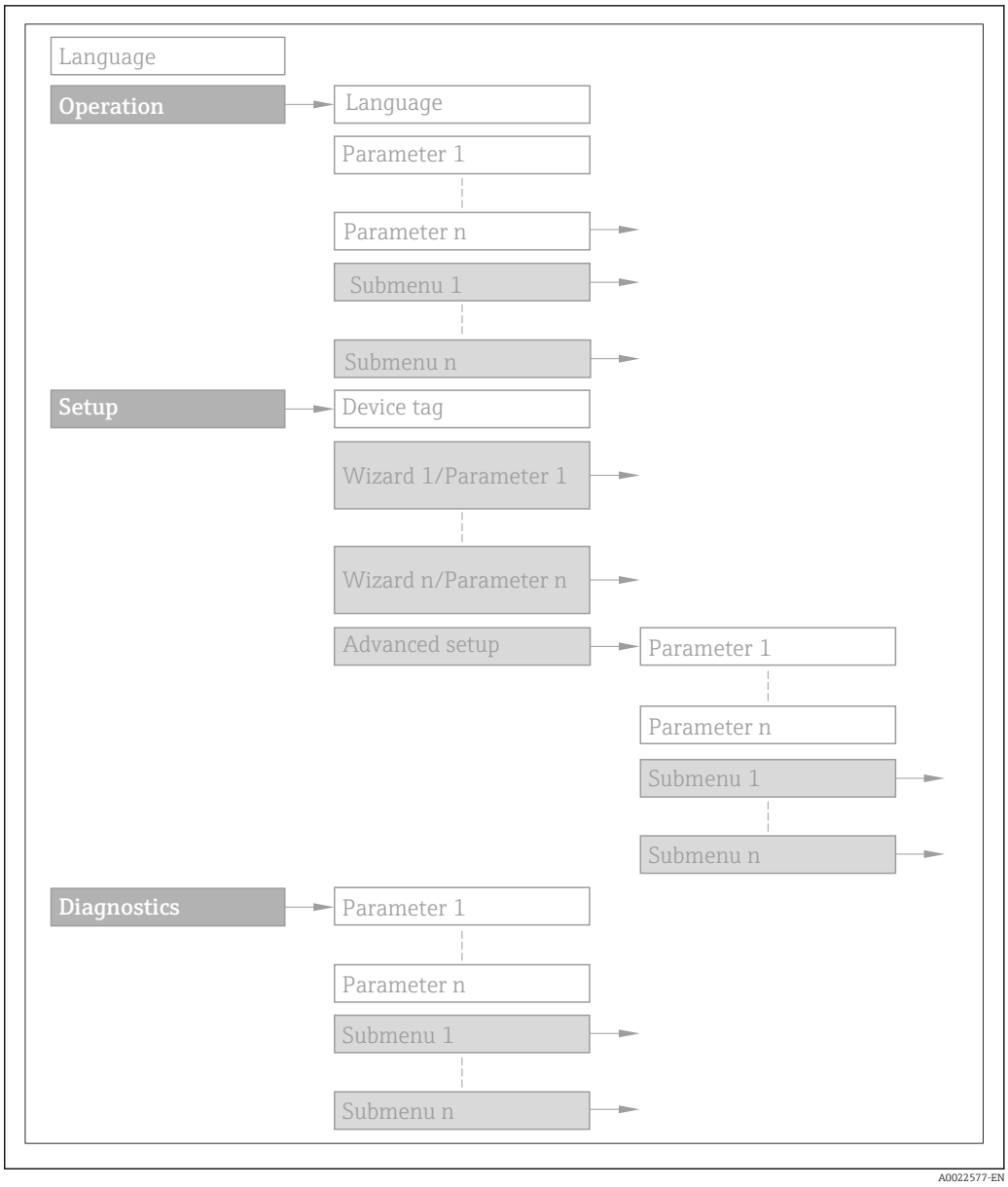
1.3.1 Information on the document structure

The document lists the submenus and their parameters according to the structure from the **Expert** menu (→ 8).



1 Sample graphic

For information on the arrangement of the parameters according to the structure of the **Operation** menu, **Setup** menu, **Diagnostics** menu (→ 162), along with a brief description, see the Operating Instructions for the device.



2 *Sample graphic*

For information about the operating philosophy, see the "Operating philosophy" chapter in the device's Operating Instructions

1.3.2 Structure of a parameter description

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

Complete parameter name	Write-protected parameter =

Navigation
Navigation path to the parameter via the local display (direct access code)
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
- Option 1
- Option 2

User entry
Input range for the parameter

User interface
User interface value/data for parameter

Factory setting
Default setting ex works

Additional information
Additional explanations (e.g. in examples):
- On individual options
- On display values/data
- On the input range
- On the factory setting
- On the parameter function

1.4 Symbols used

1.4.1 Symbols for certain types of information

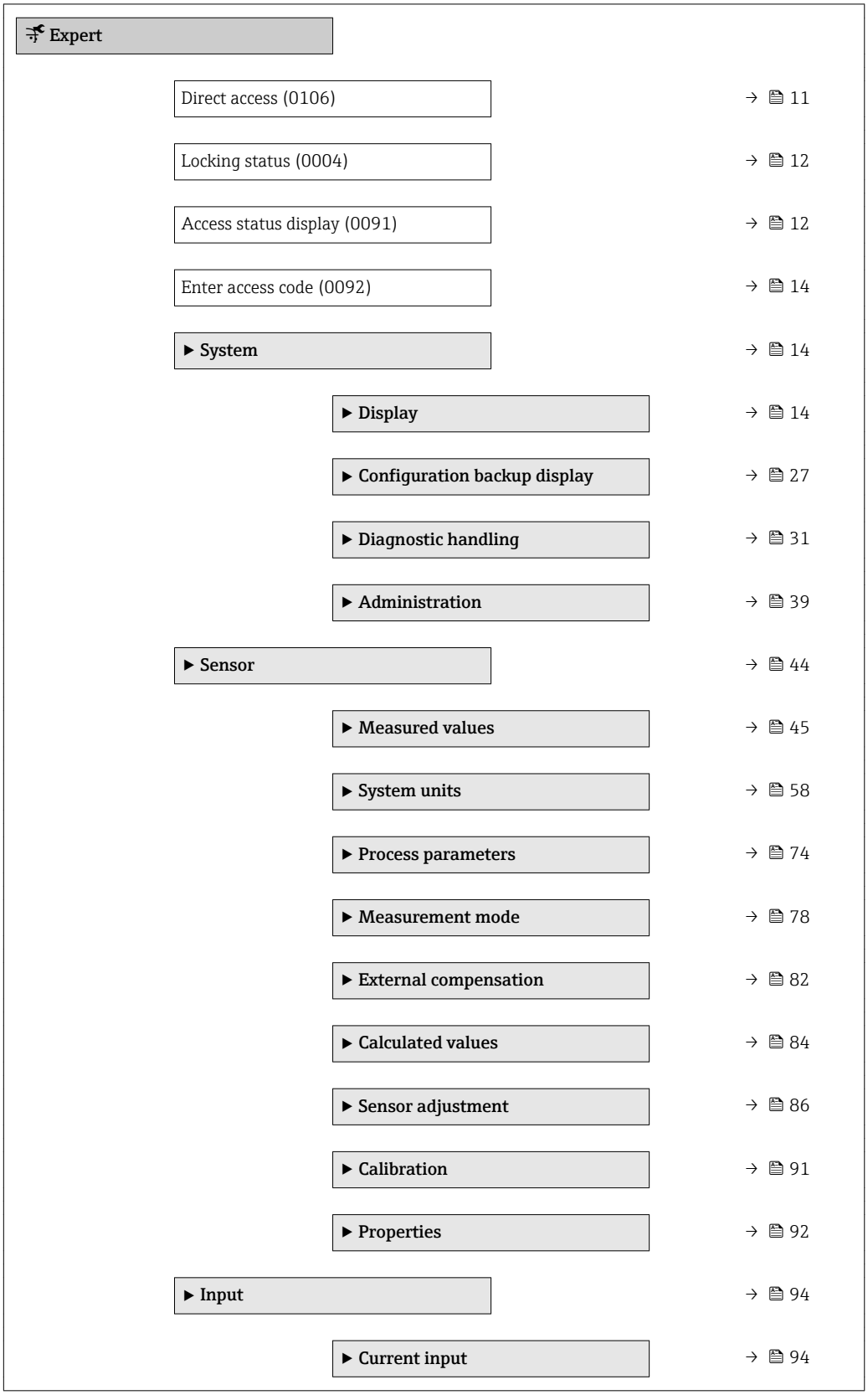
Symbol	Meaning
	Tip Indicates additional information.
	Reference to documentation
	Reference to page
	Reference to graphic
	Operation via local display
	Operation via operating tool
	Write-protected parameter

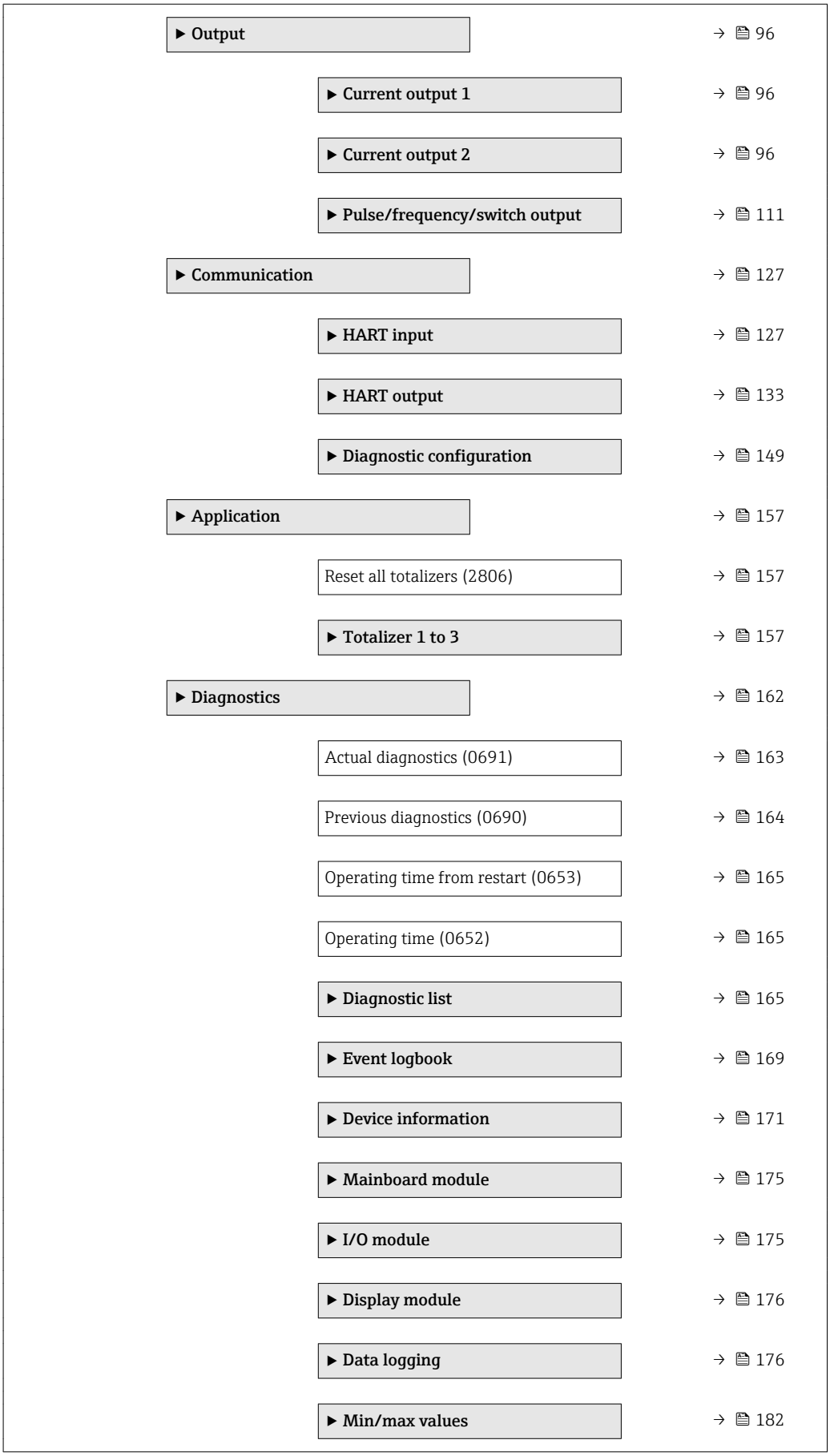
1.4.2 Symbols in graphics

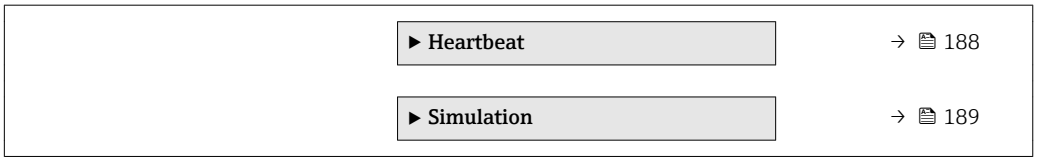
Symbol	Meaning	Symbol	Meaning
1, 2, 3 ...	Item numbers	A, B, C, ...	Views
A-A, B-B, C-C, ...	Sections		

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.




▶ Output → 96
▶ Current output 1 → 96
▶ Current output 2 → 96
▶ Pulse/frequency/switch output → 111
▶ Communication → 127
▶ HART input → 127
▶ HART output → 133
▶ Diagnostic configuration → 149
▶ Application → 157
Reset all totalizers (2806) → 157
▶ Totalizer 1 to 3 → 157
▶ Diagnostics → 162
Actual diagnostics (0691) → 163
Previous diagnostics (0690) → 164
Operating time from restart (0653) → 165
Operating time (0652) → 165
▶ Diagnostic list → 165
▶ Event logbook → 169
▶ Device information → 171
▶ Mainboard module → 175
▶ I/O module → 175
▶ Display module → 176
▶ Data logging → 176
▶ Min/max values → 182


▶ Heartbeat
→ 188
▶ Simulation
→ 189

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.

Direct access

Navigation Expert → Direct access (0106)

Description Input of the access code to enable direct access to the desired parameter via the local display. For this reason, each parameter is assigned a parameter number that appears on the right in the header of the selected parameter in the navigation view.

User entry 0 to 65 535

Additional information *User entry*

The direct access code consists of a 4-digit number and the channel number, which identifies the channel of a process variable: e.g. 0914-1

- The leading zeros in the direct access code do not have to be entered.
  Example: Input of **"914"** instead of **"0914"**
- If no channel number is entered, channel 1 is jumped to automatically.
  Example: Input of **0914** → **Assign process variable** parameter
- If a different channel is jumped to: Enter the direct access code with the corresponding channel number.
  Example: Input of **0914-3** → **Assign process variable** parameter

Locking status

Navigation Expert → Locking status (0004)

Description Use this function to view the active write protection.

User interface
- Hardware locked
- Temporarily locked

Additional information *User interface*

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

The -symbol appears in front of parameters that cannot be modified due to write protection.

"Hardware locked" option (priority 1)

The DIP switch for hardware locking is activated on the main electronics module. This locks write access to the parameters (e.g. via local display or operating tool).

Information on disabling hardware write protection is provided in the "Write protection via the locking DIP switch" section of the Operations Instructions for the device.

"Temporarily locked" option (priority 3)

Write access to the parameters is temporarily lock due to device-internal processing (e.g. data upload/download, reset). Once the internal processing has been completed, the parameters can be changed once again.

Access status display

Navigation Expert → Access stat.disp (0091)

Prerequsite A local display is provided.

Description Use this function to view the access authorization to the parameters via the local display.

User interface
- Operator
- Maintenance

Factory setting
Operator

Additional information
Description

If the -symbol appears in front of a parameter, it cannot be modified via the local display with the current access authorization.

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

For information on the **Enter access code** parameter (→ 14), see the "Disabling write protection via access code" section of the Operating Instructions for the device

If additional write protection is active, this restricts the current access authorization even further. The write protection status can be viewed via the **Locking status** parameter (→ 12).

User interface

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.

Access status tooling

Navigation
Expert → Access stat.tool (0005)

Description
Use this function to view the access authorization to the parameters via the operating tool.

User interface
- Operator
- Maintenance

Factory setting
Maintenance

Additional information
Description

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

If additional write protection is active, this restricts the current access authorization even further. The write protection status can be viewed via the **Locking status** parameter (→ 12).

User interface

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.

Enter access code

Navigation Expert → Ent. access code (0092)

Description Use this function to enter the user-specific release code to remove parameter write protection on the local display.

User entry 0 to 9 999

Enter access code

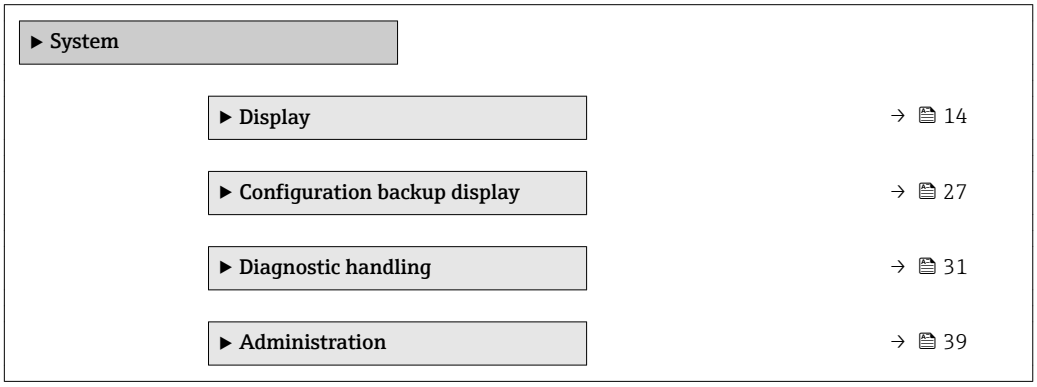
Navigation Expert → Ent. access code (0003)

Description Use this function to enter the user-specific release code to remove parameter write protection in the operating tool.

User entry 0 to 9 999

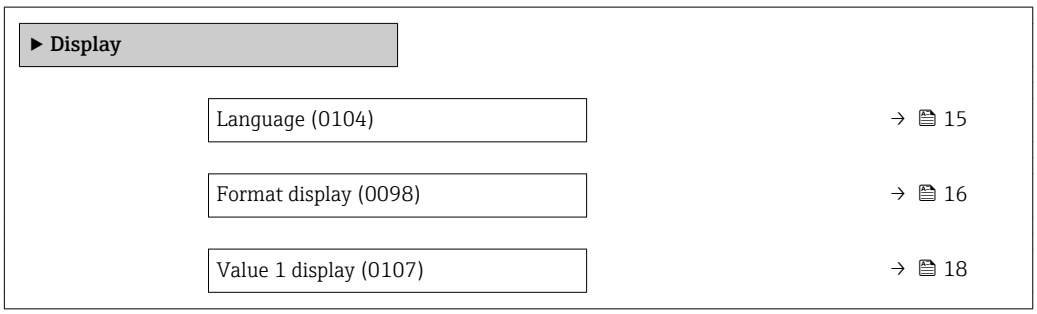
3.1 "System" submenu

Navigation Expert → System



3.1.1 "Display" submenu

Navigation Expert → System → Display



Language

Navigation Expert → System → Display → Language (0104)

Prerequsite 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) *
- العَرَبيّة (Arabic) *
- Bahasa Indonesia *
- ภาษาไทย (Thai) *
- 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)

Prerequsite

A local display is provided.

Description

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

Selection

- 1 value, max. size
- 1 bargraph + 1 value
- 2 values
- 1 value large + 2 values
- 4 values

Factory setting

1 value, max. size

Additional information

Description

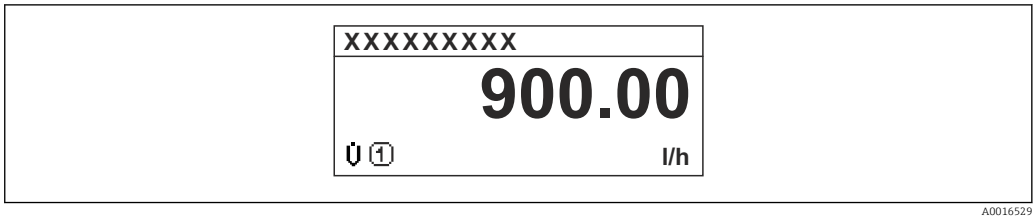
The display format (size, bar graph etc.) and number of measured values displayed simultaneously (1 to 4) can be configured. This setting only applies to normal operation.

- The **Value 1 display** parameter (→ 18)...**Value 4 display** parameter (→ 23) parameters are used to specify which measured values are shown on the display and in which 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 (→ 24) parameter.

Possible measured values shown on the local display:

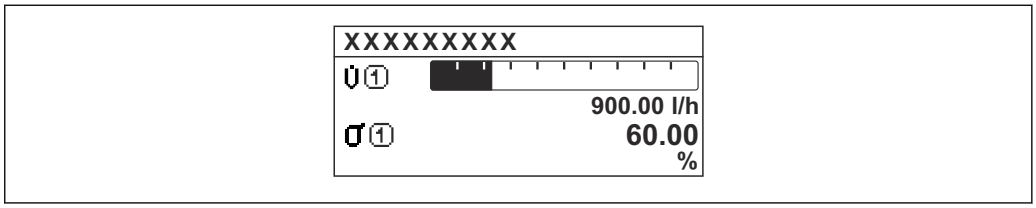
* Visibility depends on order options or device settings

"1 value, max. size" option



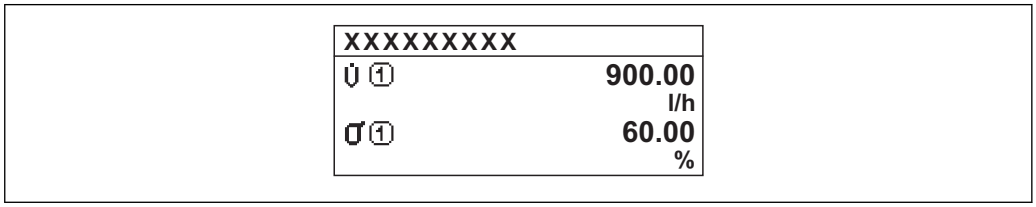
A0016529

"1 bargraph + 1 value" option



A0016530

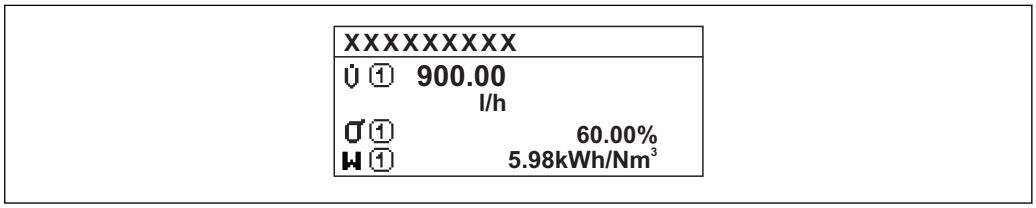
"2 values" option



A0016531

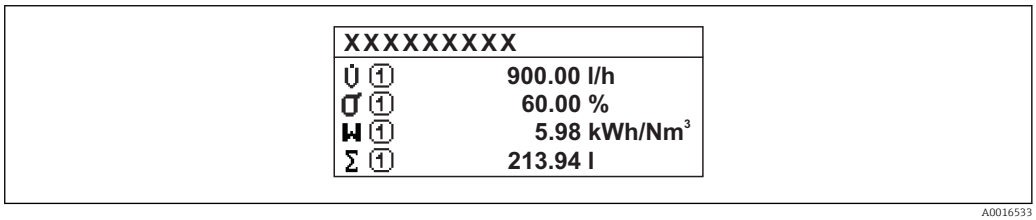
3

"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 one of the measured values to be shown on the local display.

Selection
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Methane fraction *
- Calorific value *
- Wobbe index *
- Temperature *
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Current output 1
- Current output 2 *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

Factory setting Volume flow

Additional information

Description

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

The **Format display** parameter (→ 16) 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 (→ 58).

0% bargraph value 1

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

Prerequisite A local display is provided.

* Visibility depends on order options or device settings

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

User entry Signed floating-point number

Factory setting Country-specific:
- 0 m^3/h
- 0 ft^3/h

Additional information *Description*

The **Format display** parameter (→ 16) is used to specify that the measured value is to be displayed as a bar graph.

User entry

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

100% bargraph value 1

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

Prerequsite 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 → 197

Additional information *Description*

The **Format display** parameter (→ 16) is used to specify that the measured value is to be displayed as a bar graph.

Options

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

Decimal places 1

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

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

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

Selection
- x
- x.x
- x.xx
- x.xxx
- x.xxxx

Factory setting x.xx

Additional information *Description*

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

Value 2 display

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

Prerequisite A local display is provided.

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

Selection Picklist see **Value 1 display** parameter (→ 18)

Factory setting None

Additional information *Description*

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

The **Format display** parameter (→ 16) is used to specify how many measured values are displayed simultaneously and how.

Selection

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

Decimal places 2

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

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

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

Selection
- x
- x.x
- x.xx
- x.xxx
- x.xxxx

Factory setting x.xx

Additional information *Description*

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

Value 3 display

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

Prerequsite A local display is provided.

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

Selection Picklist see **Value 1 display** parameter (→ 18)

Factory setting None

Additional information *Description*

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

The **Format display** parameter (→ 16) is used to specify how many measured values are displayed simultaneously and how.

Selection

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

0% bargraph value 3

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

Prerequsite A selection has been made in the **Value 3 display** parameter (→ 21).

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

User entry Signed floating-point number

Factory setting Country-specific:
- 0 m^3/h
- 0 ft^3/h

Additional information *Description*

The **Format display** parameter (→ 16) is used to specify that the measured value is to be displayed as a bar graph.

User entry

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

100% bargraph value 3

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

Prerequisite An option was selected in the **Value 3 display** parameter (→ 21).

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

User entry Signed floating-point number

Factory setting Depends on country and nominal diameter → 197

Additional information

Description

The **Format display** parameter (→ 16) is used to specify that the measured value is to be displayed as a bar graph.

Options

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

Decimal places 3

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

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

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

Selection

- x
- x.x
- x.xx
- x.xxx
- x.xxxx

Factory setting x.xx

Additional information

Description

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

Value 4 display

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

Prerequisite A local display is provided.

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

Selection Picklist see **Value 1 display** parameter (→ 18)

Factory setting None

Additional information

Description

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

The **Format display** parameter (→ 16) is used to specify how many measured values are displayed simultaneously and how.

Selection

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

Decimal places 4

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

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

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

Selection

- x
- x.x
- x.xx
- x.xxx
- x.xxxx

Factory setting x.xx

Additional information

Description

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

Display interval

Navigation Expert → System → Display → Display interval (0096)

Prerequisite A local display is provided.

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

User entry 1 to 10 s

Factory setting 5 s

Additional information *Description*

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

- The **Value 1 display** parameter (→ 18)...**Value 4 display** parameter (→ 23) are used to specify which measured values are shown on the display.
- The display format of the displayed measured values is specified using the **Format display** parameter (→ 16).

Display damping

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

Prerequisite A local display is provided.

Description Use this function to enter 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 3.0 s

Additional information *User entry*

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

Header

Navigation Expert → System → Display → Header (0097)

Prerequisite A local display is provided.

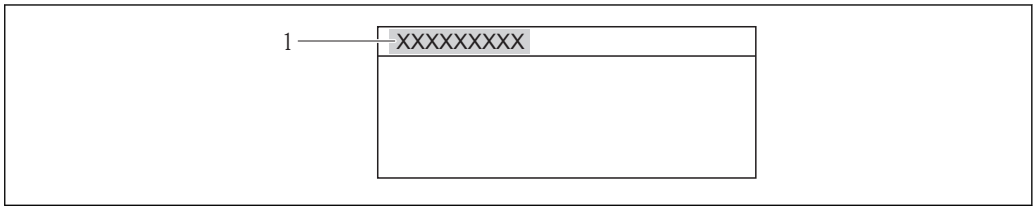
Description Use this function to select the contents of the header of the local display.

Selection
- Device tag
- Free text

Factory setting Device tag

Additional information *Description*

The header text only appears during normal operation.



1 Position of the header text on the display

Selection
- Device tag
  Is defined in the **Device tag** parameter (→ 171).
- Free text
  Is defined in the **Header text** parameter (→ 25).

Header text

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

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

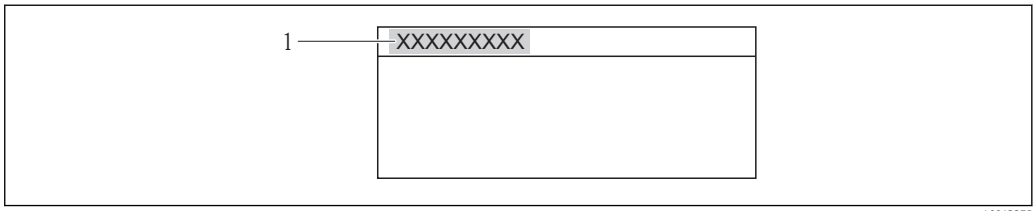
Description Use this function to enter a customer-specific text for the header of the local display.

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.



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)

Prerequsite 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)

Prerequsite 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

Additional information *Set the contrast via the push-buttons:*
- Brighter: Press and hold down the ⊟ Ⓔ keys simultaneously.
- Darker: Press and hold down the ⊞ Ⓔ keys simultaneously.

Backlight

Navigation Expert → System → Display → Backlight (0111)

Prerequsite Order code for "Display; operation", option E "SD03 4-line, illum.; touch control + data backup function"

Description Option for switching the backlight of the local display on and off.

Selection
- Disable
- Enable

Factory setting Disable

Access status display

Navigation Expert → System → Display → Access stat.disp (0091)

Prerequisite A local display is provided.

Description Use this function to view the access authorization to the parameters via the local display.

User interface
- Operator
- Maintenance

Factory setting Operator

Additional information

Description

If the -symbol appears in front of a parameter, it cannot be modified via the local display with the current access authorization.

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

For information on the **Enter access code** parameter (→ 14), see the "Disabling write protection via access code" section of the Operating Instructions for the device

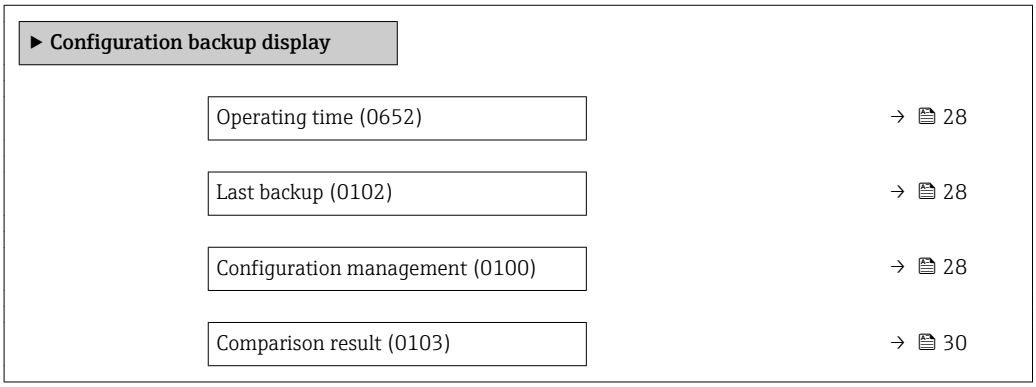
If additional write protection is active, this restricts the current access authorization even further. The write protection status can be viewed via the **Locking status** parameter (→ 12).

User interface

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.

3.1.2 "Configuration backup display" submenu

Navigation Expert → System → Conf.backup disp



Operating time

Navigation Expert → System → Conf.backup disp → Operating time (0652)

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

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

Additional information *User interface*

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

Last backup

Navigation Expert → System → Conf.backup disp → Last backup (0102)

Prerequisite A local display is provided.

Description Use this function to display the time since a backup copy of the data was last saved to the display module.

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

Configuration management

Navigation Expert → System → Conf.backup disp → Config. managem. (0100)

Prerequisite A local display is provided.

Description Use this function to select an action to save the data to the display module.

Selection
- Cancel
- Execute backup
- Restore
- Duplicate
- Compare
- Clear backup data

Factory setting Cancel

Additional information *Description*

Configuration via the local display is disabled while the action is performed.

For information on the status message in the operating tool, see the **Backup state** parameter (→ 29)

Selection

- Cancel
  No action is executed and the user exits the parameter.
- Execute backup
  - A backup copy of the current device configuration in the HistoROM is saved to the display module 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 copied from the display module to the HistoROM of the device. The backup copy comprises the transmitter data of the device.
  - The following message appears on local display: Restore active! Do not interrupt power supply!
- Duplicate
  - The transmitter configuration from another device is duplicated to the device using the display module.
  - The following message appears on local display: Copy active! Do not interrupt power supply!
- Compare
  - The device configuration saved in the display module is compared to the current device configuration of the HistoROM.
  - The following message appears on local display: Comparing files
  - The result can be viewed in the **Comparison result** parameter (→ 30).
- Clear backup data
  - The backup copy of the device configuration is deleted from the display module 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 → Conf.backup disp → Backup state (0121)

Prerequsite A local display is provided.

Description Use this function to view the status of the data backup process.

User interface
- None
- Store in progress
- Restore in progress
- Import in progress
- Delete in progress
- Compare in progress

Factory setting None

Comparison result

Navigation Expert → System → Conf.backup disp → Compar. result (0103)

Prerequsite A local display is provided.

Description Use this function to view the last result of comparing the current device configuration to the backup copy in the display module.

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 (→ 28).

Selection

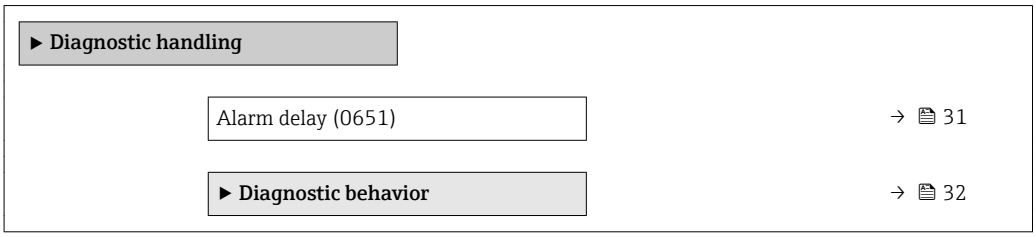
- Settings identical
  - The current device configuration of the HistoROM is identical to the backup copy in the display module.
  - If the transmitter configuration of another device has been copied to the device via the display module and the **Duplicate** option in the **Configuration management** parameter (→ 28), the current device configuration of the HistoROM only partly matches the backup copy in the display module: 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 display module.
- No backup available
  There is no backup copy of the device configuration of the HistoROM in the display module.
- Backup settings corrupt
  The current device configuration of the HistoROM is corrupt or not compatible with the backup copy in the display module.
- Check not done
  The device configuration of the HistoROM has not yet been compared to the backup copy in the display module.
- Dataset incompatible
  The backup copy in the display module 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.

User entry 0 to 60 s

Factory setting 0 s

Additional information *Description*

This setting affects the following diagnostic messages:
- 452 Calculation error
- 832 Electronic temperature too high
- 833 Electronic temperature too low
- 834 Process temperature too high
- 835 Process temperature too low
- 836 Process pressure
- 837 Process pressure
- 841 Sensor range
- 930 Process fluid
- 931 Process fluid

"Diagnostic behavior" submenu

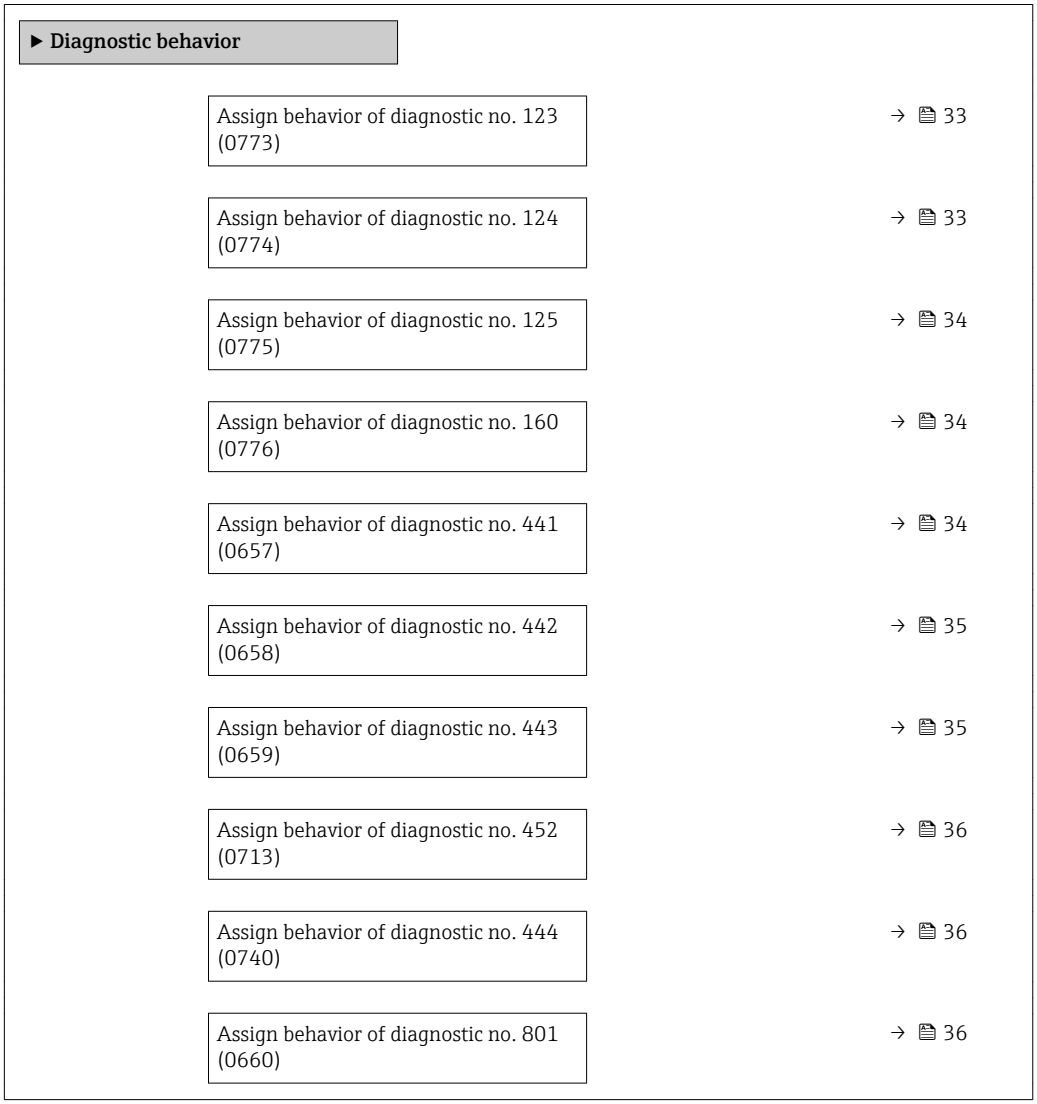
For a list of all the diagnostic events, see the Operating Instructions for the device.

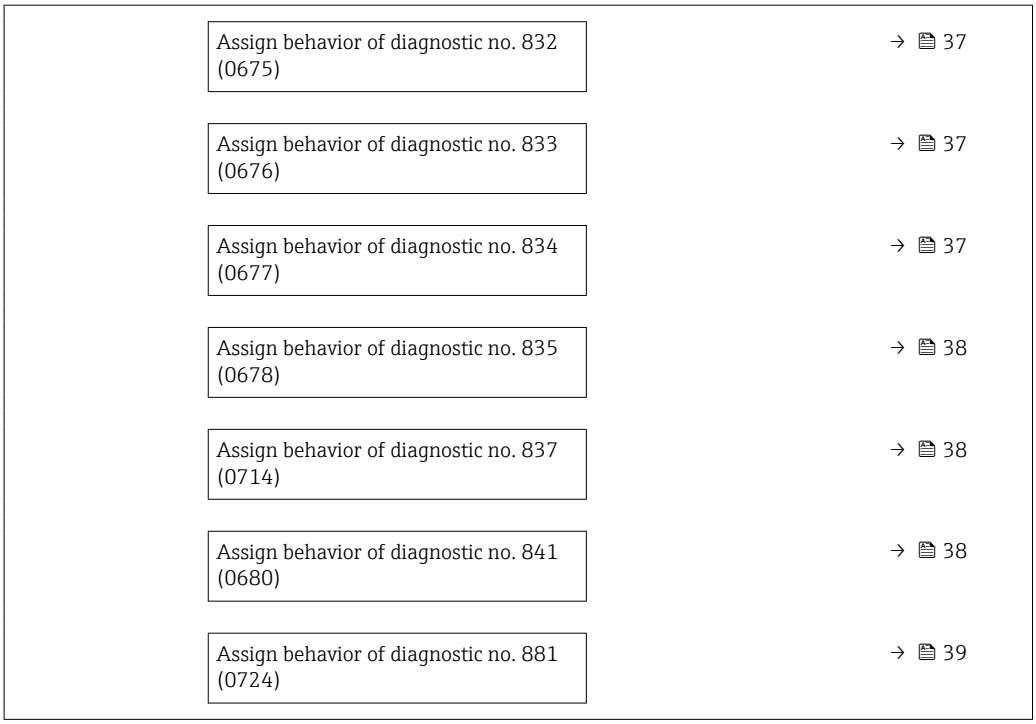
Modifying the diagnostic behavior of a diagnostic event. Each diagnostic event is assigned a certain diagnostic behavior at the factory. The user can change this assignment for certain diagnostics events.

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

- **Off** option
  The diagnostic event is ignored; it is neither entered into the Event logbook, nor is a diagnostic message generated.
- **Alarm** option
  The device continues to measure. The signal outputs assume the defined alarm condition. A diagnostic message is generated.
- **Warning** option
  The device continues to measure. A diagnostic message is generated.
- **Logbook entry only** option
  The device continues to measure. The diagnostic message is entered in the **Event logbook** submenu (→ 169) (**Event list** submenu (→ 170)) only and is not displayed in alternation with the measured value display.

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





Assign behavior of diagnostic no. 123 (Predicted signal strength)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 123 (0773)

Description Use this function to change the diagnostic behavior of the diagnostic message **123 Predicted signal strength**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

Assign behavior of diagnostic no. 124 (Relative signal strength)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 124 (0774)

Description Use this function to change the diagnostic behavior of the diagnostic message **124 Relative signal strength**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

Assign behavior of diagnostic no. 125 (Relative sound velocity)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 125 (0775)

Description Use this function to change the diagnostic behavior of the diagnostic message **125 Relative sound velocity**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

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 diagnostic message **160 Signal path switched off**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

Assign behavior of diagnostic no. 441 (Current output 1 to 2)

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

Description Use this function to change the diagnostic behavior of the diagnostic message **441 Current output 1 to 2**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

Assign behavior of diagnostic no. 442 (Frequency output)

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

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

Description Use this function to change the diagnostic behavior of the diagnostic message **442 Frequency output**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

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 diagnostic message **443 Pulse output**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

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 diagnostic message **452 Calculation error**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

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

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

Prerequsite The device has one current input (I/O module 218).

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

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

Assign behavior of diagnostic no. 801 (Supply voltage too low)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 801 (0660)

Description Use this function to change the diagnostic behavior of the diagnostic message **801 Supply voltage too low**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

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

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

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

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

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 diagnostic message **834 Process temperature too high**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

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 diagnostic message **835 Process temperature too low**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

Assign behavior of diagnostic no. 837 (Process pressure)

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

Description Use this function to change the diagnostic behavior of the diagnostic message **837 Process pressure**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

Assign behavior of diagnostic no. 841 (Sensor range)

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

Description Use this function to change the diagnostic behavior of the diagnostic message **841 Sensor range**.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

Assign behavior of diagnostic no. 881 (Sensor signal path 1 to 2)

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

Description Use this function to change the diagnostic behavior of the diagnostic message **881 Sensor signal path 1 to 2**.

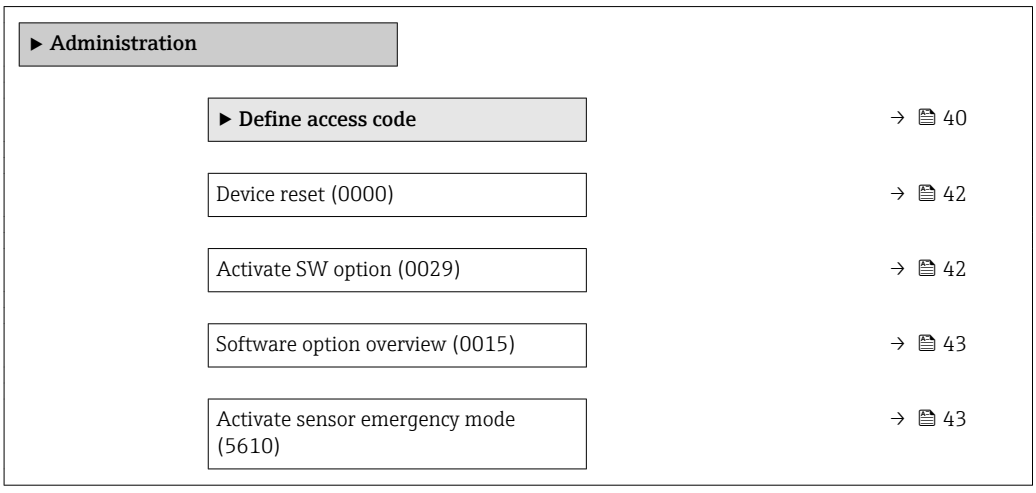
Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

Additional information For a detailed description of the options available for selection: → 32

3.1.4 "Administration" submenu

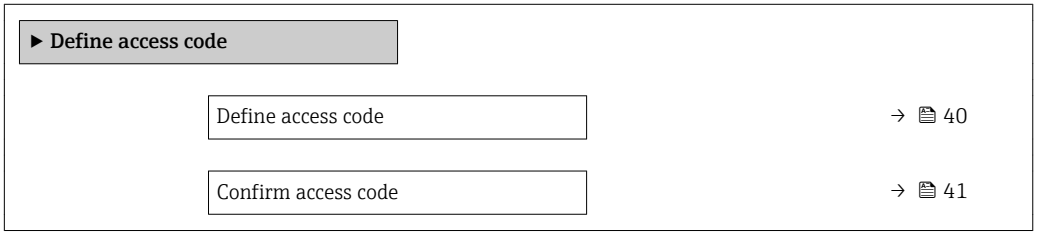
Navigation Expert → System → Administration



"Define access code" wizard

The **Define access code** wizard is only available if you are operating via the local display. If you are operating via the operating tool, the **Define access code** parameter (→ 41) is directly in the **Administration** submenu. The **Confirm access code** parameter is not available if you are operating via the operating tool.

Navigation Expert → System → Administration → Def. access code



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 configuration of the device against any inadvertent changes via the local display.

User entry 0 to 9 999

Factory setting 0

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.

Once the access code has been defined, write-protected parameters can only be modified if the access code is entered in the **Enter access code** parameter (→ 14).

Please contact your Endress+Hauser Sales Center if you lose your access code.

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 0 to 9 999

Factory setting 0

Additional parameters in the "Administration" submenu

Define access code

Navigation Expert → System → Administration → Def. access code (0093)

Description Use this function to enter a user-specific release code to restrict write-access to the parameters. This protects the configuration of the device against any inadvertent changes via the operating tool.

User entry 0 to 9 999

Factory setting 0

Additional information

Description

The write protection affects all parameters in the document marked with the symbol.

Once the access code has been defined, write-protected parameters can only be modified if the access code is entered in the **Enter access code** parameter (→ 14).

Please contact your Endress+Hauser Sales Center if you lose your access code.

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.

Device reset

Navigation Expert → System → Administration → Device reset (0000)

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

Selection
- Cancel
- To factory defaults
- To delivery settings
- Restart device

Factory setting Cancel

Additional information

"Cancel" option

No action is executed and the user exits the parameter.

"To factory defaults" option

Every parameter is reset to its factory setting.

"To delivery settings" option

Every parameter for which a customer-specific default setting was ordered is reset to this customer-specific value. All other parameters are reset to the factory setting.

This option is not visible if no customer-specific settings have been ordered.

"Restart device" option

The restart resets every parameter whose data are in the volatile memory (RAM) to the factory setting (e.g. measured value data). The device configuration remains unchanged.

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 Positive integer

Factory setting 0

Additional information

User entry

Endress+Hauser provides the corresponding activation code for the software option with the order.

Example

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

Software option overview

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

Description Use this function to display all the software options that are enabled in the device.

User interface
- Extended HistoROM
- Heartbeat Verification
- Heartbeat Monitoring

Additional information

Description

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

"Extended HistoROM" option

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

"Heartbeat Verification" option and "Heartbeat Monitoring" option

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

Activate sensor emergency mode

Navigation Expert → System → Administration → Sens. emerg.mode (5610)

Prerequsite The device has identified an error during verification of the characteristics in the sensor data storage or electronics module. A diagnostic message of status type ⊗**F** is output.

Description Use this function to switch on the emergency mode of the sensor to use the backup of the sensor characteristics or main electronics characteristics stored in the HistoROM.

Selection
- Cancel
- Ok

Factory setting Cancel

Additional information

Description

The status signal of the output diagnostic message changes from **F** (failure) to **M** (maintenance required), the diagnostic behavior changes from Alarm to Warning: ⚠**M**. The diagnostic message is output until the characteristics in the sensor data storage are again correct.

Information on what is causing the diagnostic message, and remedy measures, can be viewed by pressing the E-button.

Information on status signals and diagnostic behavior: Operating Instructions about the device, "Diagnostic message" chapter

Reset write protection

Navigation Expert → System → Administration → Res. write prot. (0019)

Prerequisite The SIL mode has been enabled.

Description Use this function to enter the SIL locking code to disable write protection in the SIL mode.

User entry 0 to 65 535

Factory setting 0

Additional information *Prerequisite*

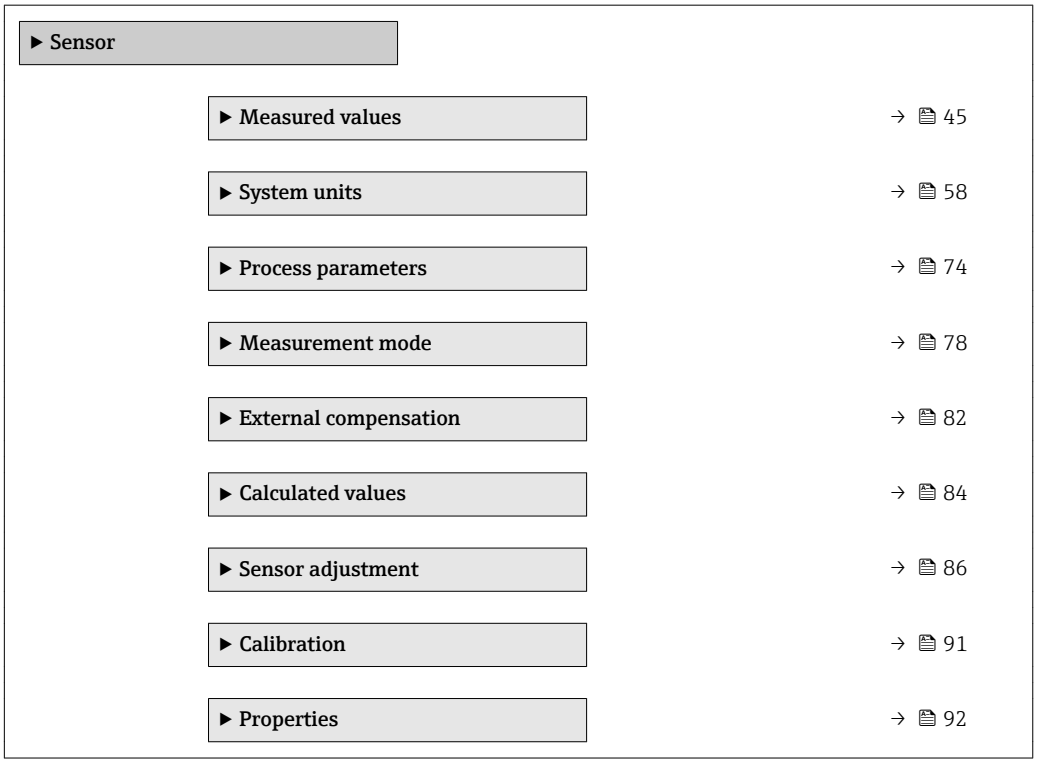
For detailed information about enabling and disabling the SIL mode, see the Special Documentation for the device

Description

Once the SIL mode has been activated, the process-related parameters are write protected, and thereby locked, for security reasons. It is still possible to read the parameters. When SIL locking is enabled, restrictions apply on all communication options, such as the service interface, the HART protocol and the onsite display.

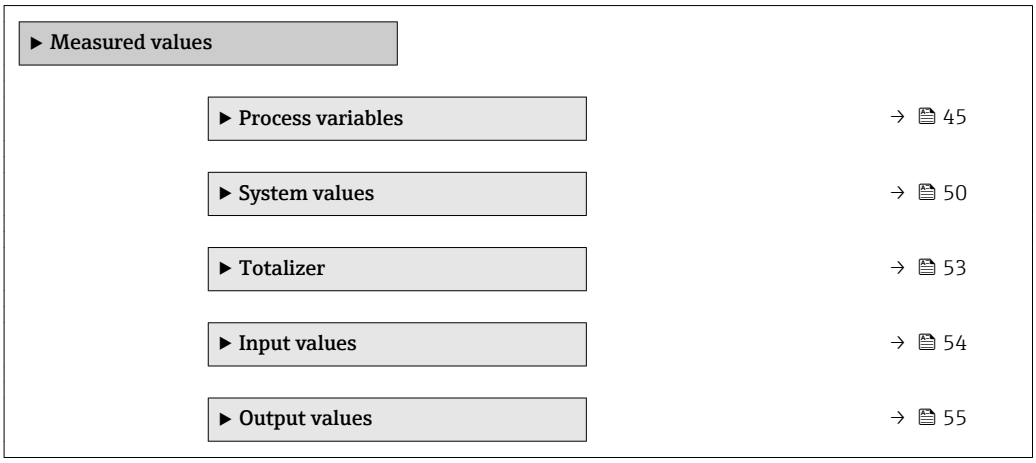
3.2 "Sensor" submenu

Navigation Expert → Sensor



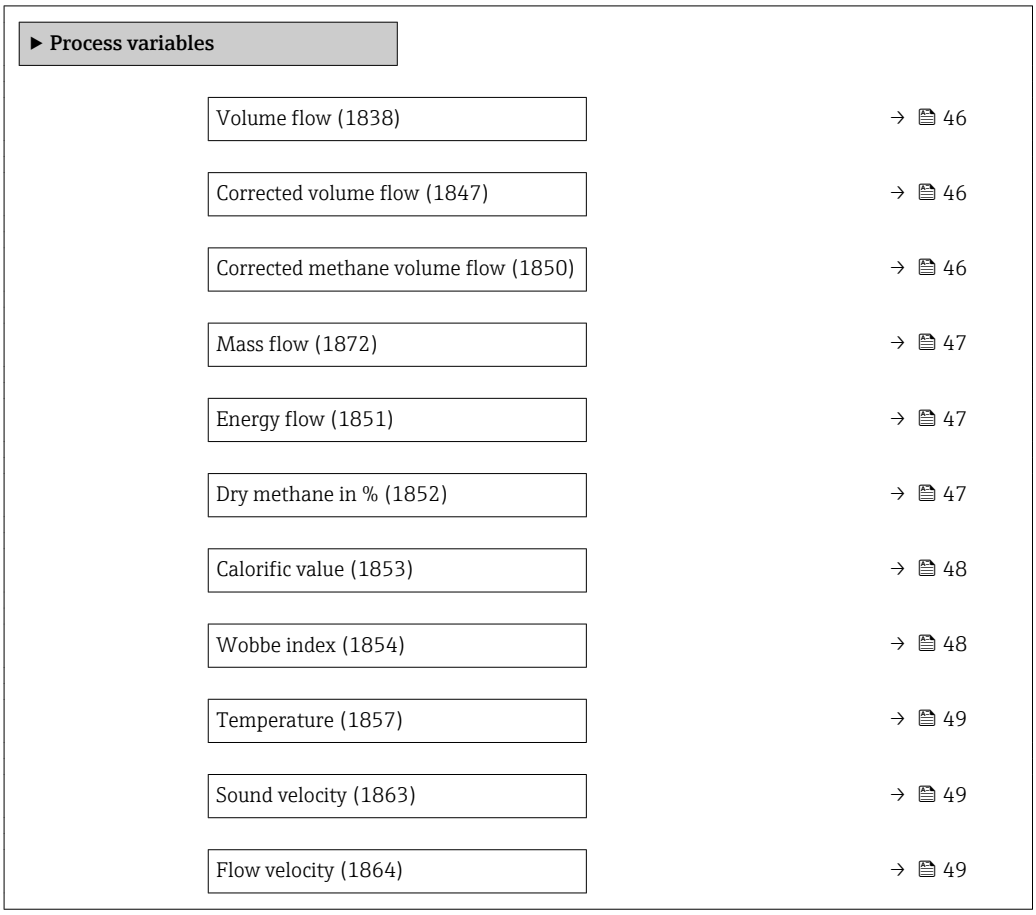
3.2.1 "Measured values" submenu

Navigation Expert → Sensor → Measured val.



"Process variables" submenu

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



Volume flow

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

Description Use this function to view the volume flow currently measured.

User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Volume flow unit** parameter (→ 58)

Corrected volume flow

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

Description Displays the corrected volume flow currently calculated.

User interface Signed floating-point number

Additional information *Description*

The corrected volume flow is derived from the measured volume flow corrected to the selected reference conditions.

Dependency

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

Corrected methane volume flow

Navigation Expert → Sensor → Measured val. → Process variab. → Corr CH4 volflow (1850)

Prerequsite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description Displays the methane corrected volume flow currently calculated.

User interface Signed floating-point number

Additional information *Description*

The methane corrected volume flow is calculated from the measured methane volume flow corrected to the selected reference conditions.

Dependency

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

Mass flow

Navigation Expert → Sensor → Measured val. → Process variab. → Mass flow (1872)

Description Displays the mass flow currently calculated.

User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Mass flow unit** parameter (→ 61)

Energy flow

Navigation Expert → Sensor → Measured val. → Process variab. → Energy flow (1851)

Prerequsite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description Displays the energy flow currently calculated.

User interface Signed floating-point number

Additional information *Description*

It is derived from the measured corrected methane volume flow and the quantity of heat that is released when the methane is burned under reference combustion conditions. This value 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 **Energy flow unit** parameter (→ 62)

Dry methane in %

Navigation Expert → Sensor → Measured val. → Process variab. → Dry CH4 in % (1852)

Prerequsite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description Displays the methane fraction of the dry gas currently measured.

User interface Signed floating-point number

Calorific value

Navigation Expert → Sensor → Measured val. → Process variab. → Calorific value (1853)

Prerequisite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description Displays the calorific value currently calculated.

User interface Signed floating-point number

Additional information

Description

The calorific value is equivalent to the quantity of heat that is released when the methane fraction is burned under predefined reference combustion conditions. This value 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 (→ 64)

Wobbe index

Navigation Expert → Sensor → Measured val. → Process variab. → Wobbe index (1854)

Prerequisite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description Displays the Wobbe index 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 (→ 64)

Temperature

Navigation Expert → Sensor → Measured val. → Process variab. → Temperature (1857)

Prerequsite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description Displays the temperature currently calculated.

User interface Signed floating-point number

Additional information *Dependency*

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

Sound velocity

Navigation Expert → Sensor → Measured val. → Process variab. → Sound velocity (1863)

Description Displays the sound velocity currently measured.

User interface Signed floating-point number

Additional information *Limit value*

The value should be between 250 to 500 m/s (820 to 1 640 ft/s). In the two-path version, this value corresponds to the average of the individual sound velocity values measured.

Dependency

The unit is taken from the **Velocity unit** parameter (→ 66)

Flow velocity

Navigation Expert → Sensor → Measured val. → Process variab. → Flow velocity (1864)

Description Displays the flow velocity currently calculated.

User interface Signed floating-point number

Additional information *Limit value*

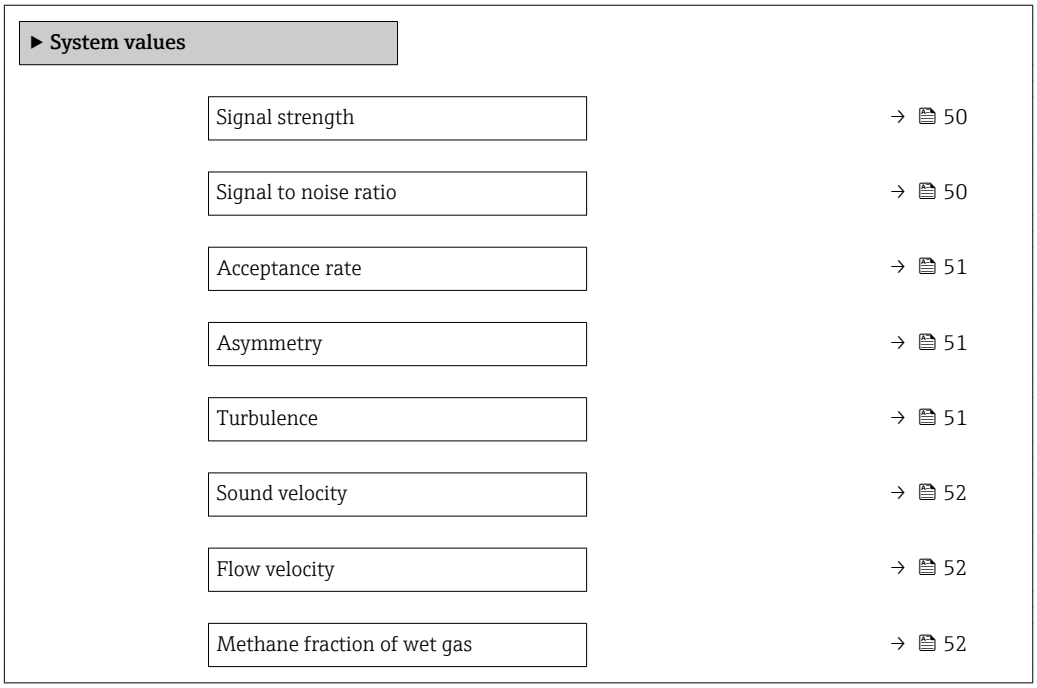
The value should be between −1 to +30 m/s (−3.3 to +98 ft/s).

Dependency

The unit is taken from the **Velocity unit** parameter (→ 66)

"System values" submenu

Navigation Expert → Sensor → Measured val. → System values



Signal strength

Navigation Expert → Sensor → Measured val. → System values → Signal strength (5650)

Description Use this function to display the current signal strength.

User interface Signed floating-point number

Additional information *Description*

A drop in the signal strength over time can be an indicator of deposit buildup on the converter or high ultrasonic damping in the gas. A very fast drop is an indication of a high concentration of CO_2.

Signal to noise ratio

Navigation Expert → Sensor → Measured val. → System values → SNR (5656)

Description Displays the current signal to noise ratio.

User interface Signed floating-point number

Additional information *Description*

A low value or a drop in the signal to noise ratio over time is an indicator of poor signal quality. A rapid drop indicates a high concentration of CO_2.

Acceptance rate

Navigation Expert → Sensor → Measured val. → System values → Acceptance rate (5601)

Description Displays the acceptance rate currently measured.

User interface 0 to 100 %

Additional information *Limit values*

The acceptance rate under ideal operating conditions is from 80 to 100 %.

An acceptance rate from 50 to 80 % is still within the specified range of the measuring device. However, the operating conditions are only close to ideal, or else a fault is present.

If the acceptance rate is below 50 %, the operating conditions are significantly below the ideal values. This indicates that faults are present or that the operating conditions are not ideal.

Asymmetry

Navigation Expert → Sensor → Measured val. → System values → Asymmetry (5605)

Prerequsite The **Dual path sensor** option is selected in the **Path configuration** parameter (→ 93).

Description Displays the assymety of the measured values between signal path 1 and signal path 2.

User interface Signed floating-point number

Factory setting 0 %

Additional information *Limit values*

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

Turbulence

Navigation Expert → Sensor → Measured val. → System values → Turbulence (5661)

Description Displays the current turbulence.

User interface Signed floating-point number

Sound velocity

Navigation Expert → Sensor → Measured val. → System values → Sound velocity (5658)

Description Use this function to view the sound velocity currently measured.

User interface Signed floating-point number

Additional information

Limit value

The value should be between 250 and 500 m/s (820 to 1640 ft/s). In the two-path version, this value corresponds to the average of the individual sound velocity values measured.

Dependency

The unit is taken from the **Velocity unit** parameter (→ 66)

Flow velocity

Navigation Expert → Sensor → Measured val. → System values → Flow velocity (5622)

Description Use this function to view the flow velocity currently calculated.

User interface Signed floating-point number

Additional information

Limit value

The value should be between −1 and +30 m/s (−3.3 to +98 ft/s).

Dependency

The unit is taken from the **Velocity unit** parameter (→ 66)

Methane fraction of wet gas

Navigation Expert → Sensor → Measured val. → System values → Meth. fract. wet (5633)

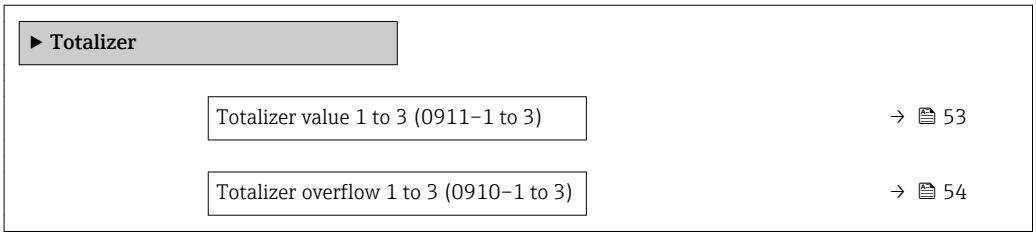
Prerequsite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description Displays the methane fraction of the wet gas currently calculated.

User interface 0 to 100 %

Totalizer

Navigation Expert → Sensor → Measured val. → Totalizer → Totalizer val. 1 to 3 (0911–1 to 3)



Totalizer value 1 to 3

Navigation Expert → Sensor → Measured val. → Totalizer → Totalizer val. 1 to 3 (0911–1 to 3)

Prerequsite One of the following options is selected in the **Assign process variable** parameter (→ 158) of the **Totalizer 1 to 3** submenu:
- Volume flow
- Corrected volume flow
- Corrected methane 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, the current counter value is the sum of the totalizer value and the overflow value from the **Totalizer overflow 1 to 3** parameterif the display range is exceeded.

In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→ 162).

User interface

The value of the process variable totalized since measuring began can be positive or negative. This depends on the settings in the **Totalizer operation mode** parameter (→ 160).

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 158).

Example

Calculation of the current totalizer reading when the value exceeds the 7-digit display range:
- Value in the **Totalizer value 1** parameter: 196 845.7 m^3
- Value in the **Totalizer overflow 1** parameter: 1 10^7 (1 overflow) = 10 000 000 [m^3]
- Current totalizer reading: 10 196 845.7 m^3

* Visibility depends on order options or device settings

Totalizer overflow 1 to 3

Navigation Expert → Sensor → Measured val. → Totalizer → Tot. overflow 1 to 3 (0910–1 to 3)

Prerequisite One of the following options is selected in the **Assign process variable** parameter (→ 158) of the **Totalizer 1 to 3** submenu:
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *

Description Displays the current totalizer overflow.

User interface Integer with sign

Additional information

Description

If the current reading has more than 7 digits, which is the maximum value range that can be displayed, the value above this range is given 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 3** parameter

User interface

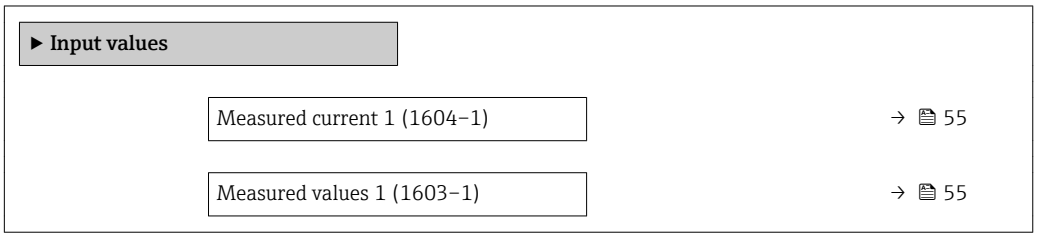
The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 158).

Example

Calculation of the current totalizer reading when the value exceeds the 7-digit display range:
- Value in the **Totalizer value 1** parameter: 196 845.7 m^3
- Value in the **Totalizer overflow 1** parameter: 2 10^7 (2 overflows) = 20 000 000 [m^3]
- Current totalizer reading: 20 196 845.7 m^3

"Input values" submenu

Navigation Expert → Sensor → Measured val. → Input values



* Visibility depends on order options or device settings

Measured current 1

Navigation Expert → Sensor → Measured val. → Input values → Measur. curr. 1 (1604–1)

Description Displays the current value of the current input.

User interface 3.59 to 22.5 mA

Measured values 1

Navigation Expert → Sensor → Measured val. → Input values → Measured val. 1 (1603–1)

Description Displays the current input value.

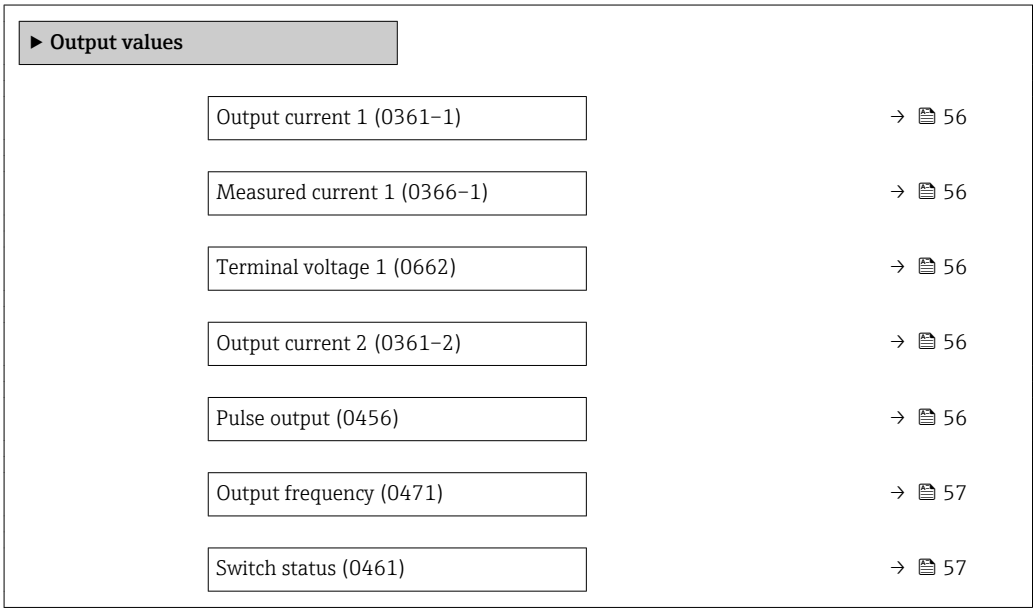
User interface Signed floating-point number

Additional information *Dependency*

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

"Output values" submenu

Navigation Expert → Sensor → Measured val. → Output values



Output current 1 to 2

Navigation Expert → Sensor → Measured val. → Output values → Output curr. 1 to 2 (0361–1 to 2)

Description Displays the actual calculated value of the output current.

User interface 3.59 to 22.5 mA

Measured current 1

Navigation Expert → Sensor → Measured val. → Output values → Measur. curr. 1 (0366–1)

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

User interface 0 to 30 mA

Terminal voltage 1

Navigation Expert → Sensor → Measured val. → Output values → Terminal volt. 1 (0662)

Description Use this function to view the actual terminal voltage that is present at the current output.

User interface 0.0 to 50.0 V

Pulse output

Navigation Expert → Sensor → Measured val. → Output values → Pulse output (0456)

Prerequsite The **Pulse** option is selected in the **Operating mode** parameter (→ 112).

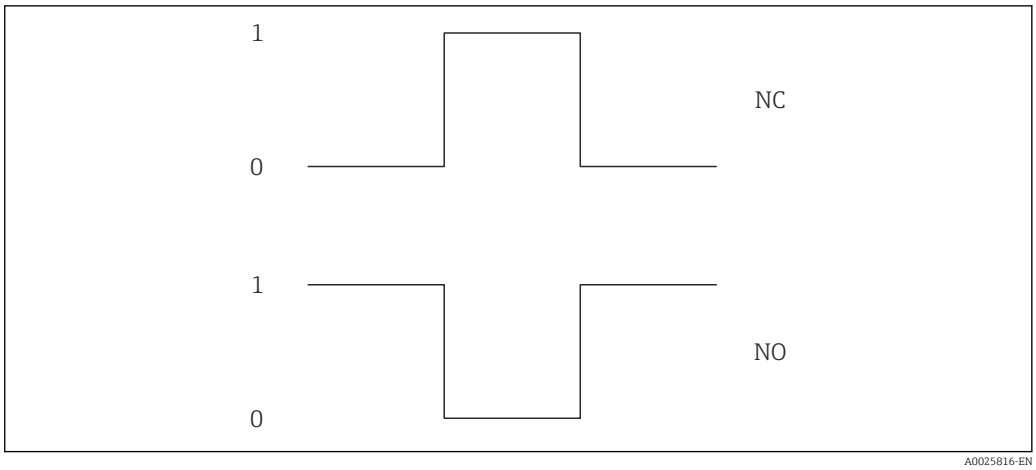
Description Displays the pulse frequency currently output.

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.

The value (i.e. the amount of the measured value) that a pulse corresponds to and the duration of the pulse can be defined using the **Value per pulse** parameter (→ 113) and the **Pulse width** parameter (→ 114).



0 Non-conductive
1 Conductive
NC Normally closed
NO Normally opened

The output behavior can be reversed using the **Invert output signal** parameter (→ 127), i.e. the transistor is not conductive for the duration of the pulse.

In addition, the behavior of the output can be configured in the event of an error (**Failure mode** parameter (→ 115)).

Output frequency

Navigation Expert → Sensor → Measured val. → Output values → Output freq. (0471)

Prerequsite The **Frequency** option is selected in the **Operating mode** parameter (→ 112).

Description Use this function to view the actual value of the output frequency which is currently measured.

User interface 0 to 1 250 Hz

Switch status

Navigation Expert → Sensor → Measured val. → Output values → Switch status (0461)

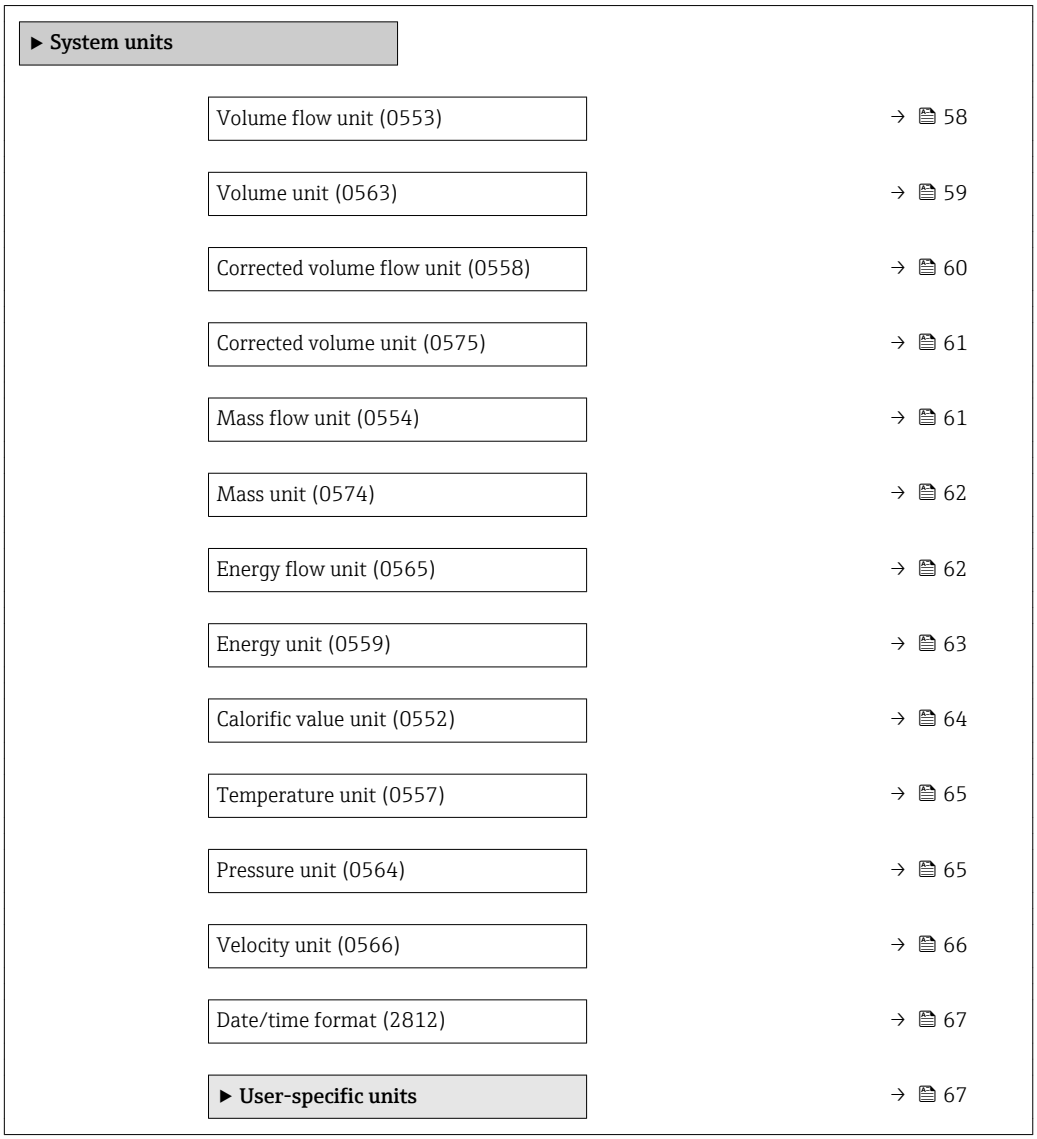
Prerequsite The **Switch** option is selected in the **Operating mode** parameter (→ 112).

Description Use this function to view the current switch status of the status output.

User interface
- Open
- Closed

3.2.2 "System units" submenu

Navigation Expert → Sensor → System units



Volume flow unit

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

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

Selection

SI units
- dm^3/s
- dm^3/min
- dm^3/h
- dm^3/d
- m^3/s
- m^3/min
- m^3/h
- m^3/d
- l/s
- l/min
- l/h
- l/d

US units
- ft^3/s
- ft^3/min
- ft^3/h
- ft^3/d

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

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

Factory setting

Country-specific:
- m^3/h
- ft^3/min

Additional information

Result

The selected unit applies for:
Volume flow parameter (→ 46)

Options

For an explanation of the abbreviated units: → 200

Customer-specific units

The unit for the customer-specific volume is specified in the **User volume text** parameter (→ 68).

Volume unit

Navigation

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

Description

Use this function to select the unit for the volume.

Selection

SI units
- dm^3
- m^3
- l

US units
ft^3

Imperial units
bbl (imp;beer)

Custom-specific units
User vol.

Factory setting

Country-specific:
- m^3
- ft^3

Additional information

Selection

For an explanation of the abbreviated units: → 200

Customer-specific units

The unit for the customer-specific volume is specified in the **User volume text** parameter (→ 68).

Corrected volume flow unit

Navigation

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

Description

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

Selection

SI units
- Nl/s
- Nl/min
- Nl/h
- Nl/d
- Nm^3/s
- Nm^3/min
- Nm^3/h
- Nm^3/d
- Sm^3/s
- Sm^3/min
- Sm^3/h
- Sm^3/d

US units
- Sft^3/s
- Sft^3/min
- Sft^3/h
- Sft^3/d

Custom-specific units
- UserCrVol./s
- UserCrVol./min
- UserCrVol./h
- UserCrVol./d

Factory setting

Country-specific:
- Nm^3/h
- Sft^3/h

Additional information

Result

The selected unit applies for:
- **Corrected volume flow** parameter (→ 46)
- **Corrected methane volume flow** parameter (→ 46)

Options

For an explanation of the abbreviated units: → 200

Customer-specific units

The unit for the customer-specific corrected volume is defined in the **User corrected volume text** parameter (→ 70).

Corrected volume unit

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

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

Selection

SI units
- Nl
- Nm^3
- Sm^3

US units
- Sft^3

Custom-specific units
UserCrVol.

Factory setting Country-specific:
- Nm^3
- Sft^3

Additional information

Options

For an explanation of the abbreviated units: → 200

Customer-specific units

The unit for the customer-specific corrected volume is defined in the **User corrected volume text** parameter (→ 70).

Mass flow unit

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

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

Selection

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

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

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

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

Additional information

Result

The selected unit applies for:
Mass flow parameter (→ 47)

Options

For an explanation of the abbreviated units: → 200

Customer-specific units

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

Mass unit

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

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

Selection

SI units
- g
- kg
- t

US units
- oz
- lb
- STon

Custom-specific units
User mass

Factory setting

Country-specific:
- kg
- lb

Additional information

Selection

For an explanation of the abbreviated units: → 200

Customer-specific units

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

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
- Mcal/h
- Mcal/d

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

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

Factory setting

Country-specific:
- kW
- Btu/h

Additional information

Options

For an explanation of the abbreviated units: → 200

Customer-specific units

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

Energy unit

Navigation

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

Description

Use this function to select the unit for energy.

Selection

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

Imperial units
- Btu
- MBtu
- MMBtu

Custom-specific units

User en.

Factory setting

Country-specific:
- kWh
- Btu

Additional information

Options

For an explanation of the abbreviated units: → 200

Customer-specific units

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

Calorific value unit

Navigation

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

Prerequisite

For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description

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

Selection

SI units
- kJ/Nm³
- kWh/Nm³
- kWh/Sm³
- kJ/Sm³

Imperial units
- Btu/Sm³
- MBtu/Sm³
- Btu/Sft³
- MBtu/Sft³

Custom-specific units
User cval.

Factory setting

Country-specific:
- kWh/Nm³
- Btu/Sft³

Additional information

Result

The selected unit applies for:
- **Calorific value** parameter (→ 48)
- **Wobbe index** parameter (→ 48)

Options

For an explanation of the abbreviated units: → 200

Customer-specific units

The unit for the customer-specific calorific value is specified in the **User calorific value text** parameter (→ 72).

Temperature unit

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

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

Selection

SI units
- °C
- K

US units
- °F
- °R

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

Additional information

Result

The selected unit applies for:
- **Temperature** parameter (→ 49)
- **Maximum value** parameter (→ 185)
- **Minimum value** parameter (→ 184)
- **Average value** parameter (→ 185)
- **Maximum value** parameter (→ 186)
- **Minimum value** parameter (→ 185)
- **Process temperature** parameter (→ 83)
- **Maximum value** parameter (→ 186)
- **Minimum value** parameter (→ 187)

Options

For an explanation of the abbreviated units: → 200

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
- Pa a
- bar a
- mbar a
- kPa a
- MPa a

US units
psi a

Custom-specific units
User pres.

Factory setting Country-specific:
- mbar a
- psi a

Additional information

Result

The unit is taken from:
- **Failure value** parameter (→ 132)
- **Measured values** parameter (→ 55)
- **4 mA value** parameter (→ 95)
- **20 mA value** parameter (→ 95)
- **Failure value** parameter (→ 96)
- **Maximum value** parameter (→ 188)
- **Atmospheric pressure** parameter (→ 83)
- **Pressure value** parameter
- **Process pressure** parameter (5640)

Options

For an explanation of the abbreviated units: → 200

Customer-specific units

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

Velocity unit

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

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

Selection

SI units	*US units*
m/s	ft/s

Factory setting

Country-specific:
- m/s
- ft/s

Additional information

Result

The selected unit applies for:
- Flow velocity (→ 49)
- Sound velocity (→ 49)
- Flow velocity (→ 52)
- Sound velocity (→ 52)
- Maximum value (→ 187)
- Minimum value (→ 187)

Options

For an explanation of the abbreviated units: → 200

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

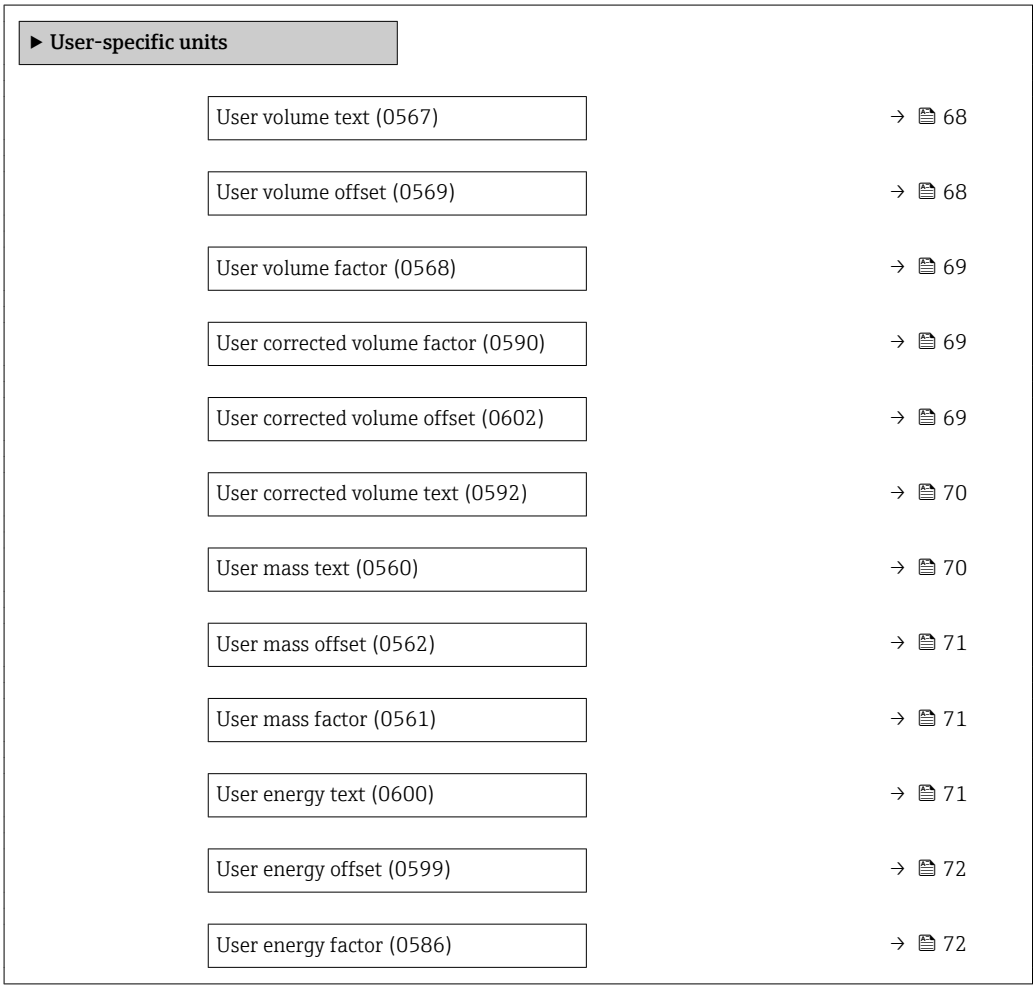
Factory setting dd.mm.yy hh:mm

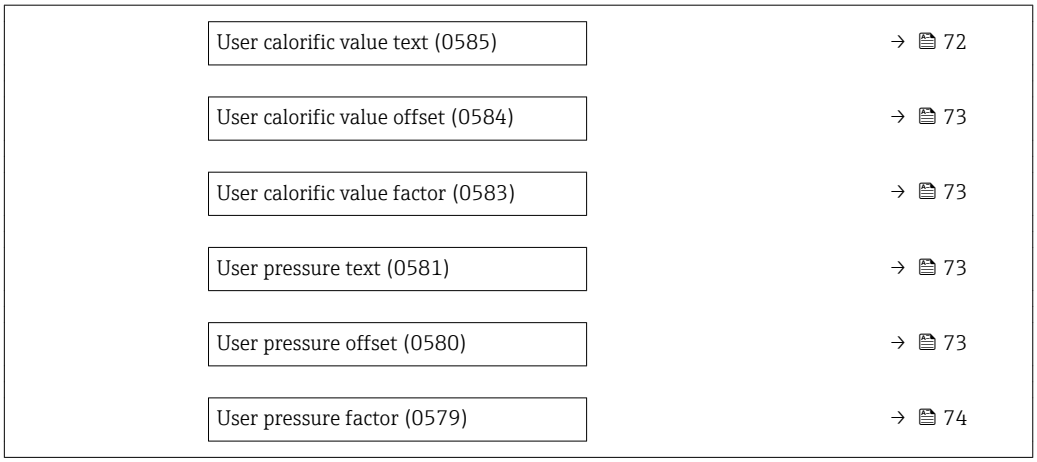
Additional information *Selection*

For an explanation of the abbreviated units: → 200

"User-specific units" submenu

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





User volume text

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

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

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

Factory setting User vol.

Additional information *Result*

The defined unit is shown as an option in the choose list of the following parameters:
- **Volume flow unit** parameter (→ 58)
- **Volume unit** parameter (→ 59)

Example

If the text GLAS is entered, the choose list of the **Volume flow unit** parameter (→ 58) shows the following options:
- GLAS/s
- GLAS/min
- GLAS/h
- GLAS/d

User volume offset

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

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

User entry Signed floating-point number

Factory setting 0

Additional information *Description*

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

User volume factor

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

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

User entry Signed floating-point number

Factory setting 1.0

User corrected volume factor

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

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

User entry Signed floating-point number

Factory setting 1.0

User corrected volume offset

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

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

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

User entry Signed floating-point number

Factory setting 0

User corrected volume text

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

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

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

Factory setting UserCrVol.

Additional information *Result*

The defined unit is shown as an option in the choose list of the following parameters:
- **Corrected volume flow unit** parameter (→ 60)
- **Corrected volume unit** parameter (→ 61)

Example

If the text GLAS is entered, the choose list of the **Corrected volume flow unit** parameter (→ 60) shows the following options:
- GLAS/s
- GLAS/min
- GLAS/h
- GLAS/d

User mass text

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

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

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

Factory setting User mass

Additional information *Description*

The defined unit is shown as an option in the choose list of the following parameters:
- **Mass flow unit** parameter (→ 61)
- **Mass unit** parameter (→ 62)

Example

If the text GLAS is entered, the choose list of the **Mass flow unit** parameter (→ 61) shows the following options:
- GLAS/s
- GLAS/min
- GLAS/h
- GLAS/d

User mass offset

Navigation Expert → Sensor → System units → User-spec. units → Mass offset (0562)

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

User entry Signed floating-point number

Factory setting 0

Additional information *Description*

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

User mass factor

Navigation Expert → Sensor → System units → User-spec. units → Mass factor (0561)

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

User entry Signed floating-point number

Factory setting 1.0

User energy text

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

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

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

Factory setting User en.

Additional information *Result*

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

Example

If the text W is entered, the choose list of the **Energy flow unit** parameter (→ 62) shows the following options:
- W/s
- W/min
- W/h
- W/d

User energy offset

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

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

User entry Signed floating-point number

Factory setting 0

User energy factor

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

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

User entry Signed floating-point number

Factory setting 1.0

User calorific value text

Navigation Expert → Sensor → System units → User-spec. units → Cal. value text (0585)

Description Use this function to enter a text for the user-specific calorific value unit. The corresponding volume units (Nm^3, m^3, ft^3, Sft^3) for the calorific value are generated automatically.

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

Factory setting User cval.

Additional information *Result*

The defined unit is shown as an option in the choose list of the **Calorific value unit** parameter (→ 64).

Example

If the text CAL is entered, the choose list of the **Calorific value unit** parameter (→ 64) shows the following options:
- CAL/Nm3
- CAL/m3
- CAL/ft3
- CAL/Sft3

User calorific value offset

Navigation Expert → Sensor → System units → User-spec. units → Cal. val. offset (0584)

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

User entry Signed floating-point number

Factory setting 0

User calorific value factor

Navigation Expert → Sensor → System units → User-spec. units → Cal. val. factor (0583)

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

User entry Signed floating-point number

Factory setting 1.0

Additional information *Example*

1 W × min = 60 J → 0.166 W × min = 1 J → user entry: 0.0166

User pressure text

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

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

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

Factory setting User pres.

Additional information *Result*

The defined unit is shown as an option in the choose list of the **Pressure unit** parameter (→ 65).

User pressure offset

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

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

User entry Signed floating-point number

Factory setting 0

User pressure factor

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

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

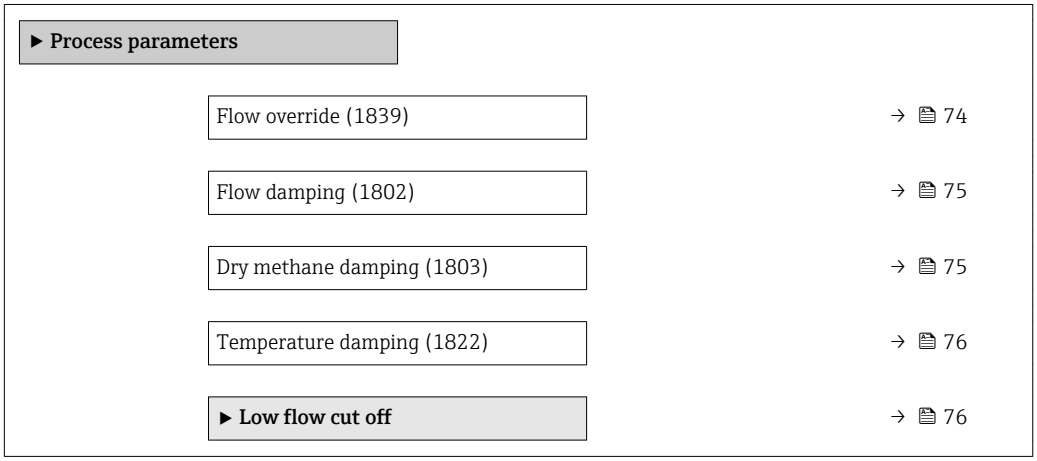
User entry Signed floating-point number

Factory setting 1.0

Additional information *Example*
1 Dyn/cm² = 0.1 Pa → 10 Dyn/cm² = 1 Pa → user entry: 10

3.2.3 "Process parameters" submenu

Navigation Expert → Sensor → Process param.



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 process of a pipeline, for example.

Selection
- Off
- On

Factory setting Off

Additional information *Result*

This setting affects all the functions and outputs of the measuring device.

Description

Flow override is active
- The diagnostic message diagnostic message ⚠**C453 Flow override** is displayed.
- Output values
  - Output: Value at zero flow
  - Temperature: Proceeding output
  - Totalizers 1-3: Stop being totalized

Flow damping

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

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

User entry 0 to 999.9 s

Factory setting 1 s

Additional information *Result*

The damping has an effect on the following variables of the device:
- Outputs → 96
- Low flow cut off → 76
- Totalizer → 157

User entry

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

Dry methane damping

Navigation Expert → Sensor → Process param. → Dry CH4 damping (1803)

Prerequsite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description Use this function to enter a damping time for dry methane in seconds.

User entry 0 to 999.9 s

Factory setting 10 s

Additional information *Result*

The damping, in addition to the dry methane, affects the following methane-dependent process variables:
- Corrected methane volume flow (→ 46)
- Energy flow (→ 47)
- Calorific value (→ 48)
- Wobbe index (→ 48)

Temperature damping

Navigation Expert → Sensor → Process param. → Temp. damping (1822)

Prerequisite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description Use this function to enter a temperature damping time in seconds.

User entry 0 to 999.9 s

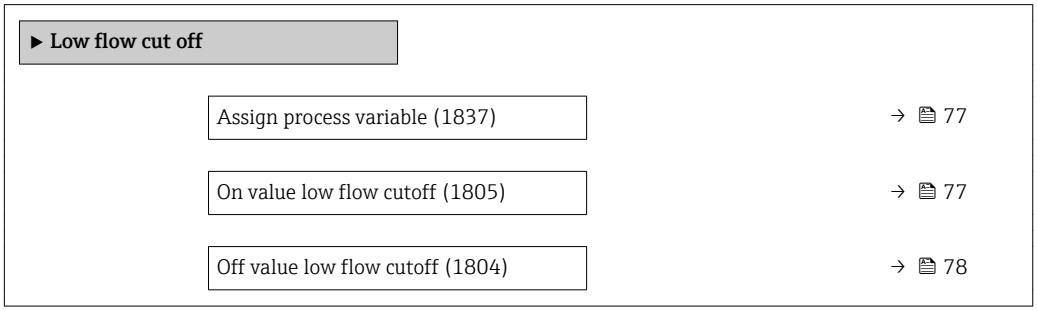
Factory setting 10 s

Additional information *Result*

The damping, in addition to the dry methane, affects the following methane-dependent process variables:
- Corrected volume flow (→ 46)
- Corrected methane volume flow (→ 46)
- Mass flow (→ 47)
- Energy flow (→ 47)

"Low flow cut off" submenu

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



Assign process variable

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

Description Use this function to select a process variable for low flow cut off.

Selection
- Off
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Flow velocity

Factory setting Off

On value low flow cutoff

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

Prerequsite One of the following options is selected in the **Assign process variable** parameter (→ 77):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Flow velocity

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 → 78.

User entry Positive floating-point number

Factory setting Depends on country and nominal diameter → 197

Additional information *Dependency*

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

* Visibility depends on order options or device settings

Off value low flow cutoff

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

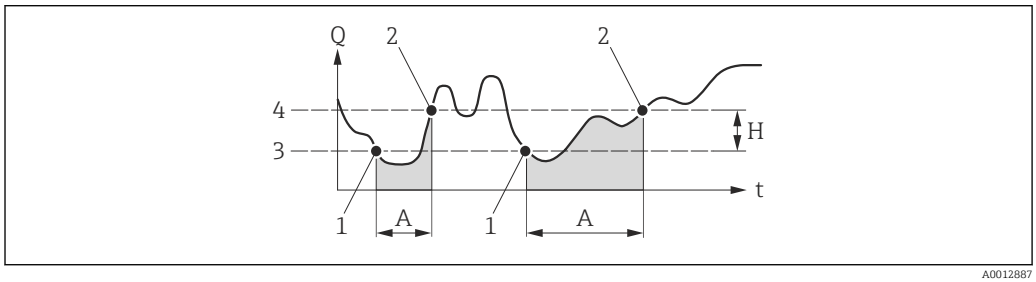
Prerequisite One of the following options is selected in the **Assign process variable** parameter (→ 77):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Flow velocity

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

User entry 0 to 100.0 %

Factory setting 50 %

Additional information *Example*

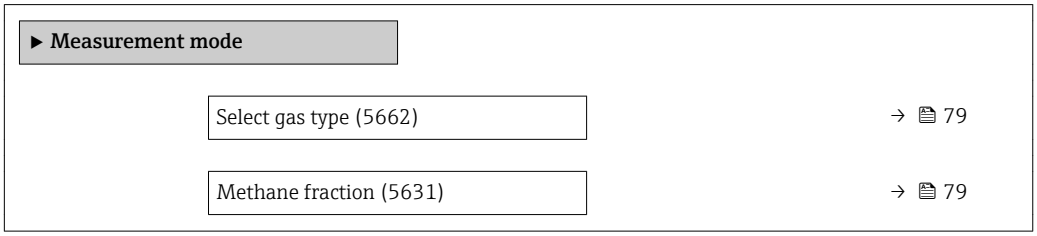


A0012887

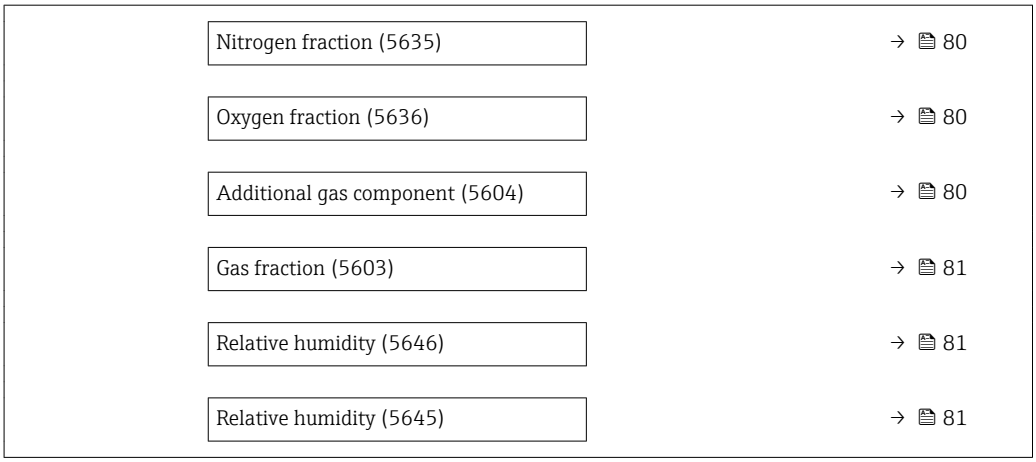
Q Flow
t Time
H Hysteresis
A Low flow cut off active
1 Low flow cut off is activated
2 Low flow cut off is deactivated
3 On value entered
4 Off value entered

3.2.4 "Measurement mode" submenu

Navigation Expert → Sensor → Measurement mode



* Visibility depends on order options or device settings



Select gas type

Navigation Expert → Sensor → Measurement mode → Select gas type (5662)

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

Selection
- Biogas
- Coal seam gas
- Air
- Nitrogen N2
- Natural gas
- User-specific biogas

Factory setting Biogas

Additional information *"Biogas" option*

The **Biogas** option is made up of 60 % methane and 40 % carbon dioxide.

Methane fraction

Navigation Expert → Sensor → Measurement mode → Methane fraction (5631)

Prerequsite The following conditions are met:
- Order code for "Sensor version", option 1 "Volume flow"
- In the **Select gas type** parameter (→ 79), the **User-specific biogas** option is selected.

Description Use this function to enter the methane fraction of the gas.

User entry Positive floating-point number

Factory setting 55 %

Additional information *Description*

Only necessary for measuring devices that do not have a methane analysis function.

Nitrogen fraction

Navigation Expert → Sensor → Measurement mode → Nitrogen fract. (5635)

Prerequsite In the **Select gas type** parameter (→ 79), the **User-specific biogas** option is selected.

Description Use this function to enter the N_2 fraction of the biogas to reduce the measuring uncertainty of the methane analysis.

User entry Positive floating-point number

Factory setting 0 %

Oxygen fraction

Navigation Expert → Sensor → Measurement mode → Oxygen fraction (5636)

Prerequsite In the **Select gas type** parameter (→ 79), the **User-specific biogas** option is selected.

Description Use this function to enter the O_2 fraction of the biogas to reduce the measuring uncertainty of the methane analysis.

User entry Positive floating-point number

Factory setting 0 %

Additional gas component

Navigation Expert → Sensor → Measurement mode → Add. gas compon. (5604)

Prerequsite In the **Select gas type** parameter (→ 79), the **User-specific biogas** option is selected.

Description Use this function to enter an additional gas component of the biogas to reduce the measuring uncertainty of the methane analysis.

Selection
- None
- Hydrogen H2
- Ammonia NH3
- Hydrogen sulfide H2S

Factory setting None

Gas fraction

Navigation Expert → Sensor → Measurement mode → Gas fraction (5603)

Prerequsite In the **Additional gas component** parameter (→ 80), one of the following options is selected:
- Hydrogen H2
- Ammonia NH3
- Hydrogen sulfide H2S

Description Use this function to enter the gas fraction to reduce the measuring uncertainty of the methane analysis.

User entry Positive floating-point number

Factory setting 0 %

Relative humidity

Navigation Expert → Sensor → Measurement mode → Rel. humidity (5646)

Prerequsite In the **Select gas type** parameter (→ 79), the **User-specific biogas** option is selected.

Description Use this function to enter the relative humidity of the user-specific biogas.

User entry 0 to 100 %

Factory setting 100 %

Relative humidity

Navigation Expert → Sensor → Measurement mode → Rel. humidity (5645)

Prerequsite In the **Select gas type** parameter (→ 79), the **Air** option is selected.

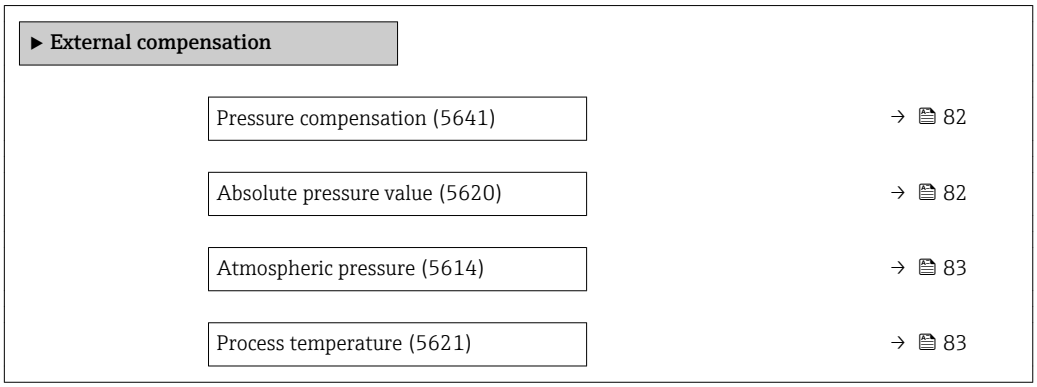
Description Use this function to enter the relative humidity of the air.

User entry 0 to 100 %

Factory setting 50 %

3.2.5 "External compensation" submenu

Navigation Expert → Sensor → External comp.



Pressure compensation

Navigation Expert → Sensor → External comp. → Pressure compen. (5641)

Description Select pressure compensation type. Pressure compensation is used to calculate the (corrected) volume flow, methane fraction and the methane measured values (e.g. calorific value).

Selection
- Fixed value
- External absolute pressure
- External gauge pressure

Factory setting Fixed value

Additional information *Options*

At almost atmospheric conditions, better accuracy can be achieved with an absolute pressure transmitter as the atmospheric air variations can account for approx. 50 mbar (50/1000 = 5 % error).

Absolute pressure value

Navigation Expert → Sensor → External comp. → Abs. press. val. (5620)

Prerequsite In the **Pressure compensation** parameter (→ 82), the **Fixed value** option is selected.

Description Use this function to enter a fixed pressure value.

User entry 700 to 11 000 mbar

Factory setting Country-specific:
- 1043 mbar a
- 15.1 psi a

Additional information *Description*

This value is needed to calculate the (corrected) volume flow, methane fraction and the methane measured values (e.g. calorific value). An incorrect entry directly affects the accuracy of the calculated values.

User entry

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

Atmospheric pressure

Navigation Expert → Sensor → External comp. → Atmosph. press. (5614)

Prerequsite In the **Pressure compensation** parameter (→ 82), the **External gauge pressure** option is selected.

Description Use this function to enter a value for the ambient pressure to be used for pressure correction.

User entry 700 to 1 100 mbar

Factory setting Country-specific:
- 1013.25 mbar a
- 14.696 psi a

Additional information *Dependency*

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

Process temperature

Navigation Expert → Sensor → External comp. → Process temp. (5621)

Prerequsite For the following order code:
"Sensor version", option 1 "Volume flow"

Description Use this function to enter a fixed temperature value.

User entry 0 to 80 °C

Factory setting Country-specific:
- 50 °C
- 122 °F

Additional information *Description*

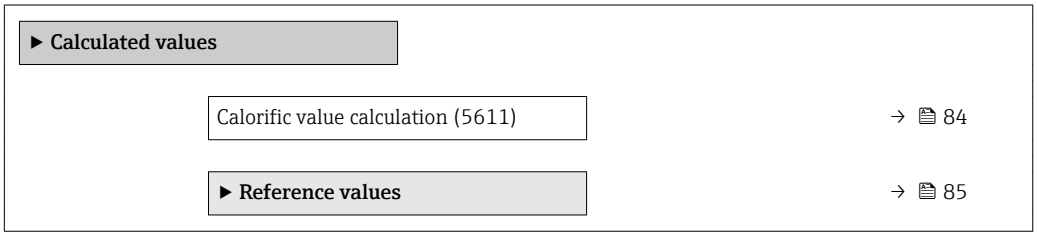
This value is needed to calculate the (corrected) volume flow, methane fraction and the methane measured values (e.g. calorific value). An incorrect entry directly affects the accuracy of the calculated values.

Dependency

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

3.2.6 "Calculated values" submenu

Navigation Expert → Sensor → Calculated value



Calorific value calculation

Navigation Expert → Sensor → Calculated value → Cal.value calc. (5611)

Description Use this function to select the reference variable for calorific value calculation.

Selection
- Gross calorific value
- Net calorific value

Factory setting Gross calorific value

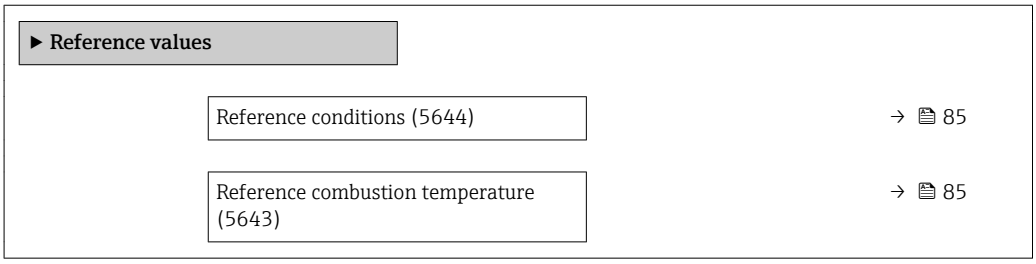
Additional information *Selection*

The **Gross calorific value** option and the **Net calorific value** option are also known by the following names:
- **Gross calorific value** option = gross energy or upper heating value or higher calorific value
- **Net calorific value** option = net energy or lower heating value or lower calorific value

This selection is also made when calculating the Wobbe index and the energy flow.

"Reference values" submenu

Navigation Expert → Sensor → Calculated value → Reference values



Reference conditions

Navigation Expert → Sensor → Calculated value → Reference values → Ref. conditions (5644)

Prerequsite The **Corrected volume flow** option is selected in the **Assign current output** parameter (→ 97).

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

Selection
- 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
- 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

Factory setting Country-specific:
- 1013.25 hPa, 0 °C
- 14.696 Psi, 59 °F

Reference combustion temperature

Navigation Expert → Sensor → Calculated value → Reference values → Ref. comb. temp. (5643)

Prerequsite The **Energy flow** option is selected in the **Assign current output** parameter (→ 97).

Description Use this function to select the reference combustion temperature for calculating the energy value of the gas.

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

Factory setting

Country-specific:
- 25 °C
- 60 °F

3.2.7 "Sensor adjustment" submenu

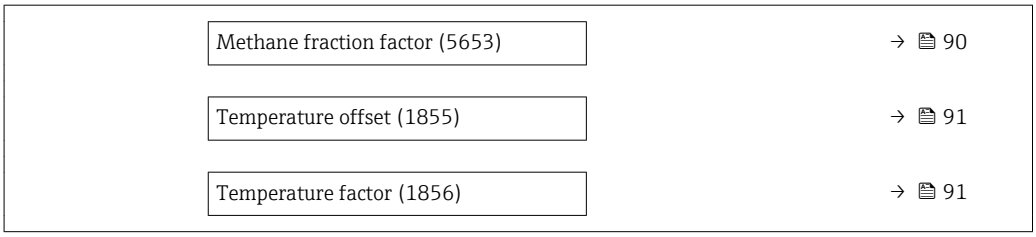
Navigation Expert → Sensor → Sensor adjustm.

▶ **Sensor adjustment**		
	▶ **Process variable adjustment**	→ 86

"Process variable adjustment" submenu

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust

▶ **Process variable adjustment**		
	Volume flow offset (1831)	→ 87
	Volume flow factor (1832)	→ 87
	Corrected volume flow offset (1841)	→ 87
	Corrected volume flow factor (1846)	→ 88
	Corrected CH4 volume flow offset (1848)	→ 88
	Corrected CH4 volume flow factor (1849)	→ 88
	Mass flow offset (1881)	→ 89
	Mass flow factor (1882)	→ 89
	Energy flow offset (1866)	→ 89
	Energy flow factor (1867)	→ 90
	Methane fraction offset (5652)	→ 90



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 1 m^3/s.

User entry Signed floating-point number

Factory setting 0 m^3/s

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

Corrected volume flow offset

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol offset (1841)

Description Use this function to enter the zero point shift for the corrected volume flow trim. The corrected volume flow unit on which the shift is based is 1 Nm^3/s.

User entry Signed floating-point number

Factory setting 0 Nm^3/s

Additional information *Description*

Corrected value = (factor × value) + offset

Corrected volume flow factor

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol factor (1846)

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

User entry Positive floating-point number

Factory setting 1

Corrected CH4 volume flow offset

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Corr CH4 VolOffs (1848)

Prerequsite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description Use this function to enter the zero point shift for the methane corrected volume flow trim. The corrected methane volume flow unit on which the shift is based is 1 Nm^3/s.

User entry Signed floating-point number

Factory setting 0 Nm^3/s

Additional information *Description*

Corrected value = (factor × value) + offset

Corrected CH4 volume flow factor

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Corr CH4 vol fac (1849)

Prerequsite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description Use this function to enter a quantity factor for the methane corrected volume flow. This multiplication factor is applied over the methane corrected volume flow range.

User entry Positive floating-point number

Factory setting 1

Mass flow offset

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Mass flow 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 kg/s

Additional information *Description*

Corrected value = (factor × value) + offset

Mass flow factor

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Mass flow 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

Energy flow offset

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → En. flow offset (1866)

Prerequsite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

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 W

Additional information *Description*

Corrected value = (factor × value) + offset

Energy flow factor

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → En. flow factor (1867)

Prerequisite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

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

Methane fraction offset

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Methane offset (5652)

Prerequisite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description Use this function to enter the zero point shift for the methane fraction trim. The methane fraction unit on which the shift is based is 1 %.

User entry −100 to 100 %

Factory setting 0 %

Additional information *Description*

Corrected value = (factor × value) + offset

Methane fraction factor

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Methane factor (5653)

Prerequisite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

Description Use this function to enter a quantity factor for the methane fraction. This multiplication factor is applied over the methane fraction range.

User entry Positive floating-point number

Factory setting 1

Temperature offset

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Temp. offset (1855)

Prerequsite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

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 K

Additional information *Description*

Corrected value = (factor × value) + offset

Temperature factor

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Temp. factor (1856)

Prerequsite For the following order code:
"Sensor version", option 2 "Volume flow + biogas analysis"

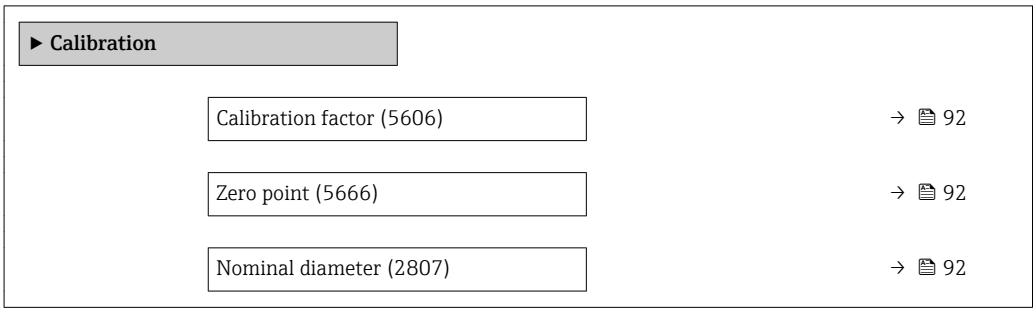
Description Use this function to enter a quantity factor for the temperature. In each case, this factor refers to the temperature in Kelvin.

User entry Positive floating-point number

Factory setting 1

3.2.8 "Calibration" submenu

Navigation Expert → Sensor → Calibration



Calibration factor

Navigation Expert → Sensor → Calibration → Cal. factor (5606)

Description Displays the current calibration factor for the sensor.

User interface Signed floating-point number

Factory setting Depends on calibration

Zero point

Navigation Expert → Sensor → Calibration → Zero point (5666)

Description Displays the current zero point correction value for the sensor.

User interface Signed floating-point number

Factory setting Depends on calibration

Nominal diameter

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

Description Use this function to view the nominal diameter of the sensor.

User interface DNxx / x"

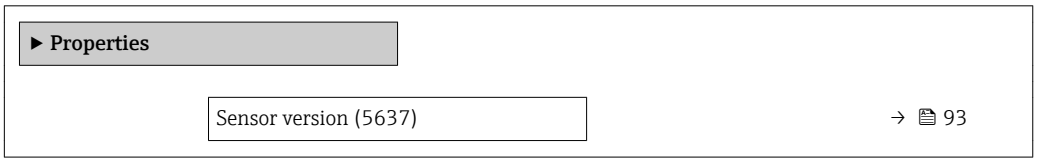
Factory setting Depends on the size of the sensor

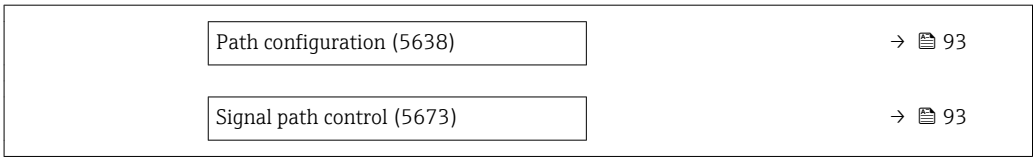
Additional information *Description*

The value is also specified on the sensor nameplate.

3.2.9 "Properties" submenu

Navigation Expert → Sensor → Properties





Sensor version

Navigation Expert → Sensor → Properties → Sensor version (5637)

Description Displays the sensor version.

User interface
- Volume flow
- Volume flow + biogas analysis

Factory setting Volume flow + biogas analysis

Path configuration

Navigation Expert → Sensor → Properties → Path conf. (5638)

Description Displays the path version.

User interface
- Single path sensor
- Dual path sensor

Factory setting Dual path sensor

Signal path control

Navigation Expert → Sensor → Properties → Sig.path control (5673)

Prerequsite The **Dual path sensor** option is selected in the **Path configuration** parameter (→ 93).

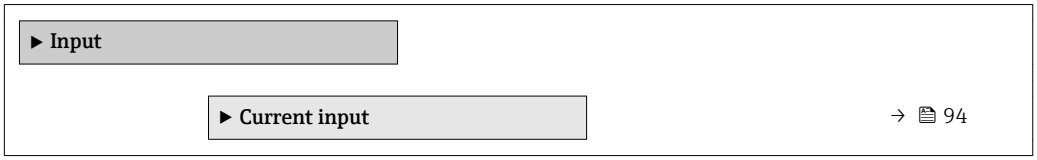
Description Displays the path control.

User interface
- All signal paths
- Only signal path 1
- Only signal path 2

Factory setting All signal paths

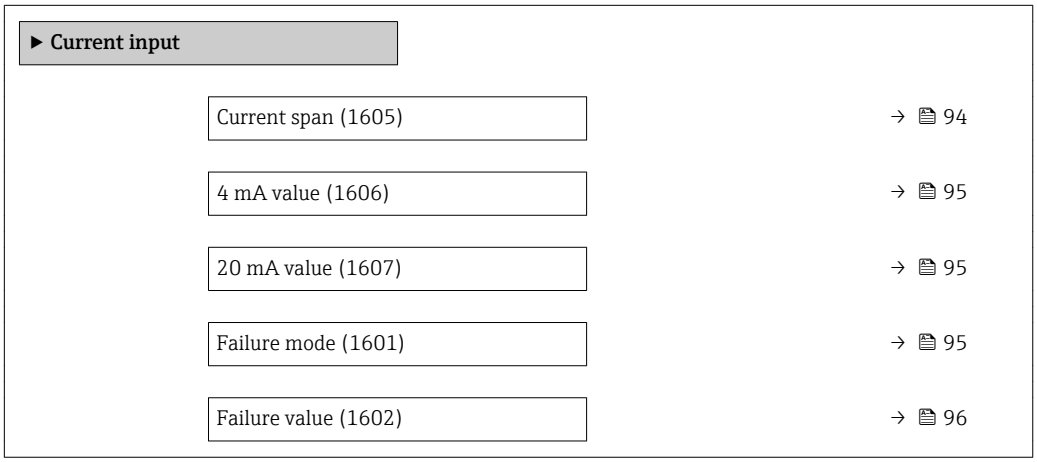
3.3 "Input" submenu

Navigation Expert → Input



3.3.1 "Current input" submenu

Navigation Expert → Input → Current input



Current span

Navigation Expert → Input → Current input → Current span (1605)

Description Use this function to select the current range for the process value to be read in.

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

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

Additional information *Examples*

Sample values for the current range: **Current span** parameter (→ 98)

4 mA value

Navigation Expert → Input → Current input → 4 mA value (1606)

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

User entry Positive floating-point number

Factory setting 700 mbar

Additional information

Dependency

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

Current input behavior

The current input behaves differently depending on the settings configured in the following parameters:
- Current span (→ 94)
- Failure mode (→ 95)

Configuration examples

Pay attention to the configuration examples for **4 mA value** parameter (→ 99).

20 mA value

Navigation Expert → Input → Current input → 20 mA value (1607)

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

User entry Positive floating-point number

Factory setting Depends on country and nominal diameter

Additional information

Dependency

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

Configuration examples

Pay attention to the configuration examples for **4 mA value** parameter (→ 99).

Failure mode

Navigation Expert → Input → Current input → Failure mode (1601)

Description Use this function to select the input behavior when measuring a current outside the configured **Current span** parameter (→ 94).

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 (→ 96)).

Failure value

Navigation Expert → Input → Current input → Failure value (1602)

Prerequsite In the **Failure mode** parameter (→ 95), the **Defined value** option is selected.

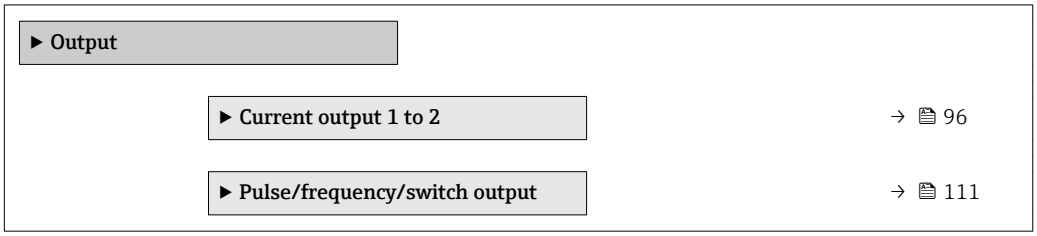
Description Use this function to enter the value that the device uses if it does not receive an input signal from the external device, or if the input signal is invalid.

User entry Signed floating-point number

Factory setting 0 mbar

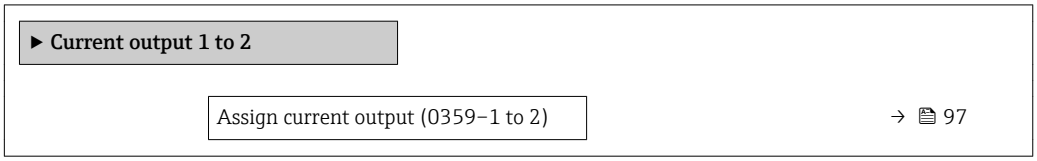
3.4 "Output" submenu

Navigation Expert → Output



3.4.1 "Current output 1 to 2" submenu

Navigation Expert → Output → Curr.output 1 to 2



Assign current output

Navigation

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

Expert → Output → Curr.output 2 → Assign curr. (0359–2)

Description

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

Selection

- Off
- Mass flow
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Temperature *
- Energy flow *
- Methane fraction *
- Calorific value *
- Wobbe index *
- Sound velocity

* Visibility depends on order options or device settings

- Flow velocity
- Acceptance rate
- Signal asymmetry
- Turbulence
- Signal strength
- Signal to noise ratio

Factory setting Volume flow

Current span

Navigation

Expert → Output → Curr.output 1 → Current span (0353–1)

Expert → Output → Curr.output 2 → Current span (0353–2)

Description

The selection specifies the operational range for the process value and the upper and lower level for signal on alarm.

Selection

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

Factory setting

Country-specific:
- 4...20 mA NAMUR
- 4...20 mA US

Additional information

Description

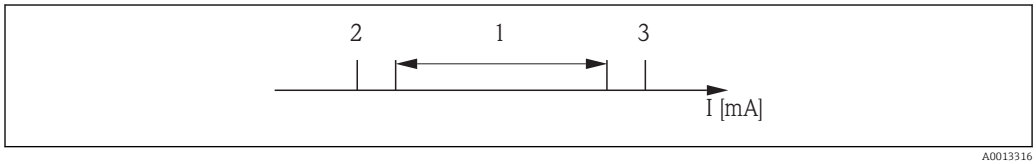
- If an error occurs, the current output adopts the value defined in the **Failure mode** parameter (→ 108).
- If the measured value is outside the measuring range, the diagnostic message ⚠**S441 Current output 1 to 2** is displayed.
- The measuring range is specified by the **4 mA value** parameter (→ 99) and **20 mA value** parameter (→ 101).

"Fixed current" option

The current value is set via the **Fixed current** parameter (→ 99).

Example

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



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

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

If the flow hits the upper or lower Signal on Alarm Level, the diagnostic message ⚠**S441 Current output 1 to 2** is displayed.

Fixed current

Navigation
Expert → Output → Curr.output 1 → Fixed current (0365–1)
Expert → Output → Curr.output 2 → Fixed current (0365–2)

Prerequsite
The **Fixed current** option is selected in the **Current span** parameter (→ 98).

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

User entry
3.59 to 22.5 mA

Factory setting
4 mA

Additional information
Example
This setting can be used for HART multidrop, for example.

4 mA value

Navigation
Expert → Output → Curr.output 1 → 4 mA value (0367–1)
Expert → Output → Curr.output 2 → 4 mA value (0367–2)

Prerequsite
One of the following options is selected in the **Current span** parameter (→ 98):
- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA

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

User entry
Signed floating-point number

Factory setting
Country-specific:
- 0 m^3/h
- 0 ft^3/min

Additional information
Description
Positive and negative values are permitted depending on the process variable assigned in the **Assign current output** parameter (→ 97). In addition, the value can be greater or smaller than the value assigned for the 20 mA current in the **20 mA value** parameter (→ 101).

Dependency

The unit depends on the process variable selected in the **Assign current output** parameter (→ 97).

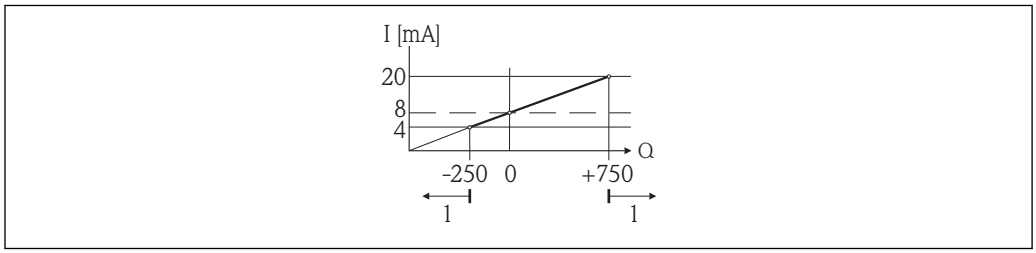
Current output behavior

The current output behaves differently depending on the settings configured in the following parameters:
- Current span (→ 98)
- Measuring mode (→ 102)
- Failure mode (→ 108)

Configuration examples

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

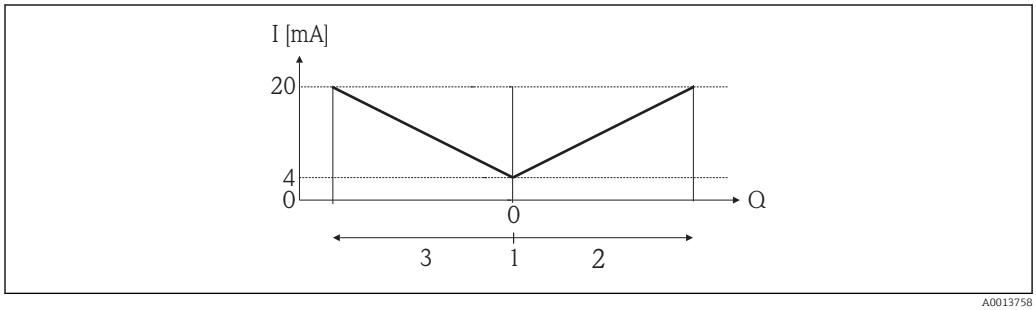
Configuration example A
Measuring mode with **Forward flow** option
- **4 mA value** parameter (→ 99) = not equal to zero flow (e.g. −250 m^3/h)
- **20 mA value** parameter (→ 101) = not equal to zero flow (e.g. +750 m^3/h)
- Calculated current value = 8 mA at zero flow



Q Flow
I Current
1 Measuring range is exceeded or undershot

The operational range of the measuring device is defined with the values entered for the **4 mA value** parameter (→ 99) and **20 mA value** parameter (→ 101). If the effective flow exceeds or falls below this operational range, the diagnostic message ⚠**S441 Current output 1 to 2** is output.

Configuration example B
Measuring mode with **Forward/Reverse flow** option



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

The current output signal is independent of the direction of flow (absolute amount of the measured variable). The values for the **4 mA value** parameter (→ 🖹 99) and **20 mA value** parameter (→ 🖹 101) must have the same sign. The value for **20 mA value** parameter (→ 🖹 101) (e.g. reverse flow) corresponds to the mirrored value for **20 mA value** parameter (→ 🖹 101) (e.g. forward flow).

Configuration example C
Measuring mode with **Reverse flow compensation** option
If flow is characterized by severe fluctuations (e.g. when using Piston pumps), flow components outside of the measuring range are buffered, balanced and output after a maximum delay of 60 s → 🖹 102.

20 mA value

Navigation
Expert → Output → Curr.output 1 → 20 mA value (0372–1)
Expert → Output → Curr.output 2 → 20 mA value (0372–2)

Prerequsite
One of the following options is selected in the **Current span** parameter (→ 🖹 98):
- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA

Description
Enter a value for the 20 mA current.

User entry
Signed floating-point number

Factory setting
Depends on country and nominal diameter → 🖹 197

Additional information

Description

Positive and negative values are permitted depending on the process variable assigned in the **Assign current output** parameter (→ 🖹 97). In addition, the value can be greater or smaller than the value assigned for the 4 mA current in the **4 mA value** parameter (→ 🖹 99).

Dependency

The unit depends on the process variable selected in the **Assign current output** parameter (→ 🖹 97).

Example

- Value assigned to 4 mA = −250 m^3/h
- Value assigned to 20 mA = +750 m^3/h
- Calculated current value = 8 mA (at zero flow)

If the **Forward/Reverse flow** option is selected in the **Measuring mode** parameter (→ 🖹 102), different signs cannot be entered for the values for the **4 mA value** parameter (→ 🖹 99) and **20 mA value** parameter (→ 🖹 101). The diagnostic message ⚠**S441 Current output 1 to 2** is displayed.

Configuration examples

Pay attention to the configuration examples for **4 mA value** parameter (→ 🖹 99).

Measuring mode

Navigation

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

Expert → Output → Curr.output 2 → Measuring mode (0351–2)

Prerequisite

One of the following options is selected in the **Assign current output** parameter (→ 97):
- Mass flow
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Temperature
- Energy flow *
- Methane fraction *
- Calorific value *
- Wobbe index *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

One of the following options is selected in the **Current span** parameter (→ 98):
- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA

Description

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

Selection

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

Factory setting

Forward flow

Additional information

Description

The process variable that is assigned to the current output via the **Assign current output** parameter (→ 97) is displayed below the parameter.

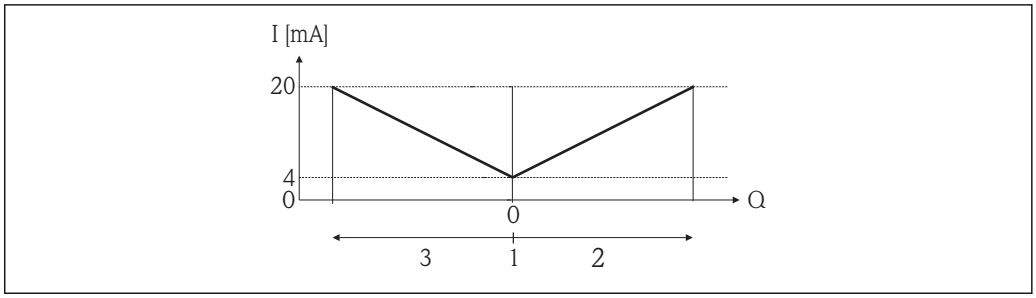
"Forward flow" option

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

The flow components outside the scaled measuring range are taken into account for signal output as follows:
- Both values are defined such that they are not equal to zero flow (e.g.
  - 4 mA current value = −5 m^3/h
  - 20 mA current value = 10 m^3/h
- If the effective flow exceeds or falls below the measuring range, the diagnostic message ⚠**S441 Current output 1 to 2** is output.

* Visibility depends on order options or device settings

"Forward/Reverse flow" option



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

- The current output signal is independent of the direction of flow (absolute amount of the measured variable). The values for the **4 mA value** parameter (→ 🖹 99) and **20 mA value** parameter (→ 🖹 101) must have the same sign.
- The value for **20 mA value** parameter (→ 🖹 101) (e.g. reverse flow) corresponds to the mirrored value for **20 mA value** parameter (→ 🖹 101) (e.g. forward flow).

"Reverse flow compensation" option

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

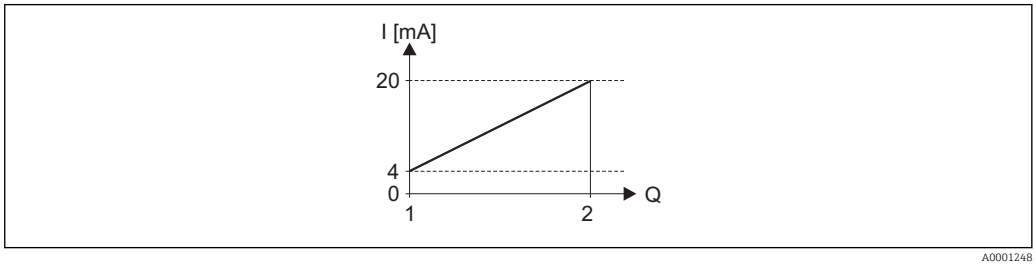
If buffering is not processed within approx. 60 s, the diagnostic message ⚠**S441 Current output 1 to 2** is displayed.

Under certain plant conditions, flow values can aggregate in the buffer, for example in the case of prolonged and unwanted fluid reverse flow. However, this buffer is reset in all relevant programming adjustments which affect the current output.

Examples of how the current output behaves

Example 1

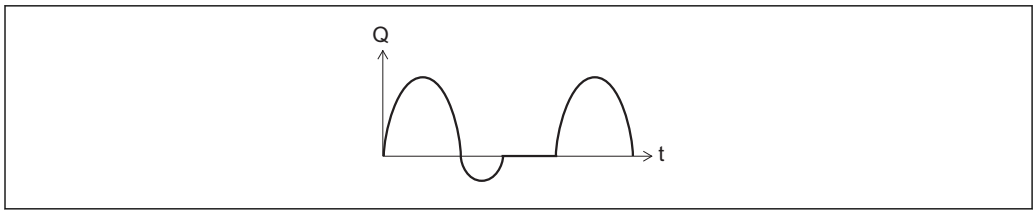
Defined measuring range: lower range value and upper range value with the **same** sign



🖼 4 *Measuring range*

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

With the following flow response:

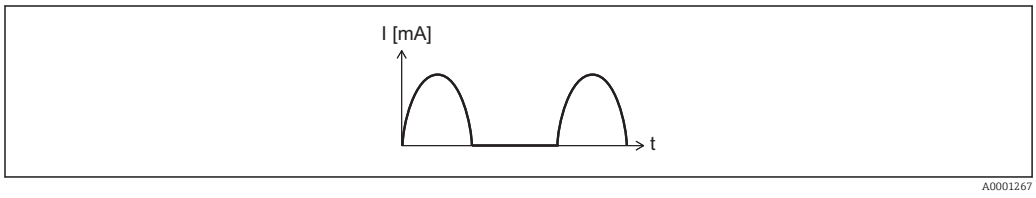


5 Flow response

Q Flow
t Time

With **Forward flow** option

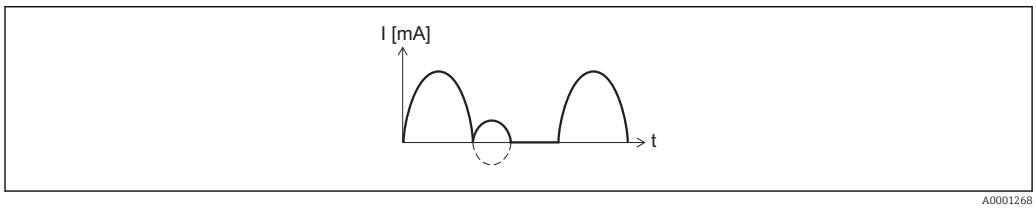
The current output signal is proportional to the process variable assigned. The flow components outside the scaled measuring range are not taken into account for signal output:.



I Current strength
t Time

With **Forward/Reverse flow** option

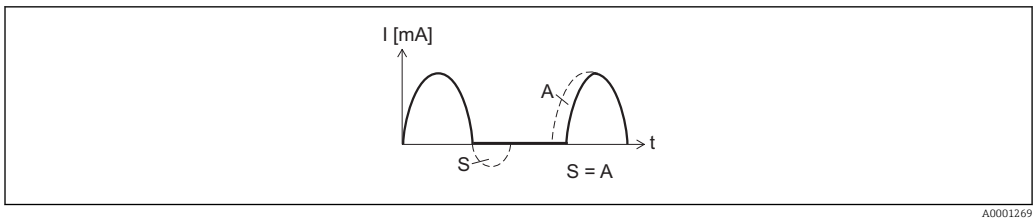
The current output signal is independent of the direction of flow.



I Current strength
t Time

With **Reverse flow compensation** option

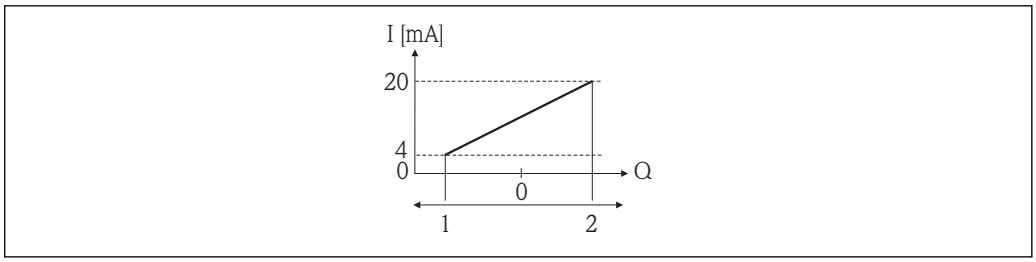
Flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.



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

Example 2

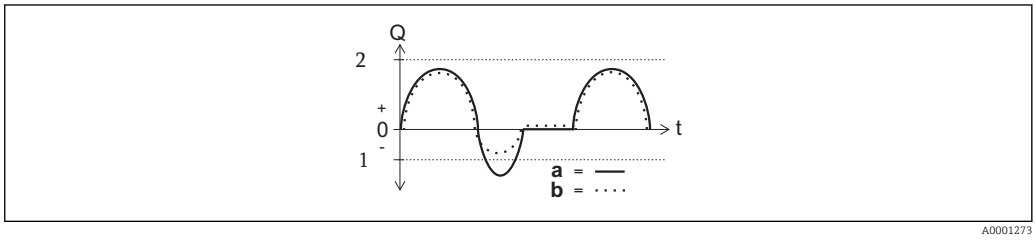
Defined measuring range: lower range value and upper range value with **different** signs



6 Measuring range

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

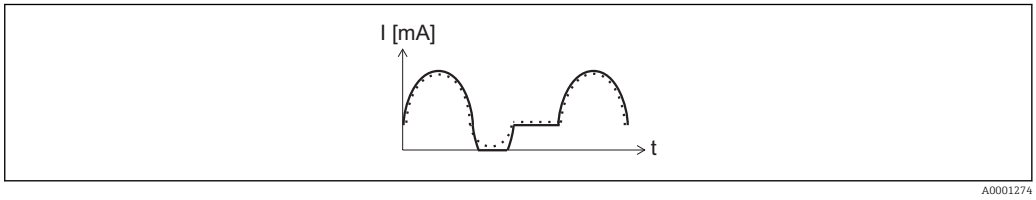
With flow a (—) outside, b (- -) inside the measuring range



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

With **Forward flow** option

- a (—): The flow components outside the scaled measuring range cannot be taken into account for signal output.
  The diagnostic message ⚠**S441 Current output 1 to 2** is output.
- b (····): The current output signal is proportional to the process variable assigned.



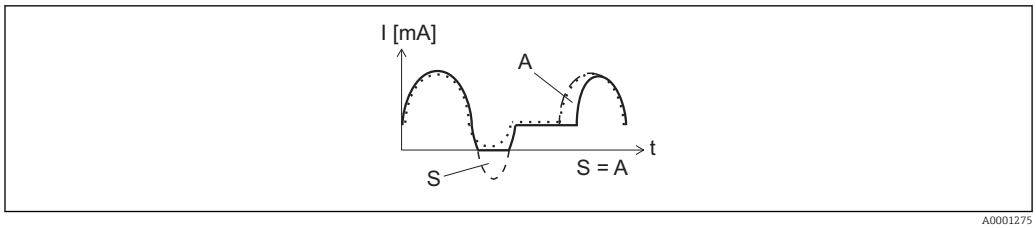
I Current strength
t Time

With **Forward/Reverse flow** option

This option cannot be selected here as the values for the **4 mA value** parameter (→ 🖹 99) and **20 mA value** parameter (→ 🖹 101) have different signs.

With **Reverse flow compensation** option

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



A0001275

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

Damping output

Navigation

Expert → Output → Curr.output 1 → Damping out. (0363–1)

Expert → Output → Curr.output 2 → Damping out. (0363–2)

Prerequsite

One of the following options is selected in the **Assign current output** parameter (→ 97):
- Mass flow
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Temperature
- Energy flow *
- Methane fraction *
- Calorific value *
- Wobbe index *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

One of the following options is selected in the **Current span** parameter (→ 98):
- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA

Description

Use this function to enter 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

3.0 s

* Visibility depends on order options or device settings

Additional information *User entry*

Use this function to enter a time constant:
- 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.

Response time

Navigation

Expert → Output → Curr.output 1 → Response time (0378–1)

Expert → Output → Curr.output 2 → Response time (0378–2)

Prerequsite

One of the following options is selected in the **Assign current output** parameter (→ 97):
- Mass flow
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Temperature
- Energy flow *
- Methane fraction *
- Calorific value *
- Wobbe index *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

One of the following options is selected in the **Current span** parameter (→ 98):
- 4…20 mA NAMUR
- 4…20 mA US
- 4…20 mA

Prerequsite

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

User interface Positive floating-point number

* Visibility depends on order options or device settings

Additional information *Description*

The response time is made up of the time specified for the following dampings:
- Current output damping → 106
  and
- Depending on the measured variable assigned to the output.
  – Flow damping
    or
  – Temperature damping
    or
  – Dry methane damping

Failure mode

Navigation
Expert → Output → Curr.output 1 → Failure mode (0364–1)
Expert → Output → Curr.output 2 → Failure mode (0364–2)

Prerequisite
One of the following options is selected in the **Assign current output** parameter (→ 97):
- Mass flow
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Temperature
- Energy flow *
- Methane fraction *
- Calorific value *
- Wobbe index *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

One of the following options is selected in the **Current span** parameter (→ 98):
- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA

Description
Use this function to select the value of the current output in the event of an alarm condition.

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

Factory setting
Max.

* Visibility depends on order options or device settings

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 (→ 98).

"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 (→ 98).

"Last valid value" option

The current output is based on the last measured value that was valid before the error occurred.

"Actual value" option

The current output is based on the actual measured value on the basis of the current flow measurement; the error is ignored.

"Defined value" option

The current output adopts a defined measured value.

The measured value is determined using the **Failure current** parameter (→ 109).

Failure current

Navigation

Expert → Output → Curr.output 1 → Failure current (0352–1)

Expert → Output → Curr.output 2 → Failure current (0352–2)

Prerequsite

The **Defined value** option is selected in the **Failure mode** parameter (→ 108).

Description

Use this function to enter a fixed value that the current output adopts in an alarm condition.

User entry

3.59 to 22.5 mA

Factory setting

22.5 mA

Output current 1 to 2

Navigation

Expert → Output → Curr.output 1 to 2 → Output curr. 1 to 2 (0361–1 to 2)

Description

Displays the actual calculated value of the output current.

User interface

3.59 to 22.5 mA

Start-up mode

Navigation

Expert → Output → Curr.output 1 → Start-up mode (0368–1)

Expert → Output → Curr.output 2 → Start-up mode (0368–2)

Prerequisite

In the **Current span** parameter (→ 98), one of the following options is selected:
- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA

Description

Use this function to select the current value that the current output adopts during the device start-up phase as long as no measured value is present.

Selection

- Min.
- Max.
- Defined value

Factory setting

Min.

Additional information

"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 (→ 98).

"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 (→ 98).

"Defined value" option

The current output outputs a defined current value.

The current value is defined via the **Start-up current** parameter (→ 110).

Start-up current

Navigation

Expert → Output → Curr.output 1 → Start-up current (0369–1)

Expert → Output → Curr.output 2 → Start-up current (0369–2)

Prerequisite

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

Description

Use this function to enter a fixed current value that the current output adopts during the device start-up phase as long as no measured value is present.

User entry

3.59 to 22.5 mA

Factory setting

3.6 mA

Measured current 1

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

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

User interface 0 to 30 mA

Terminal voltage 1

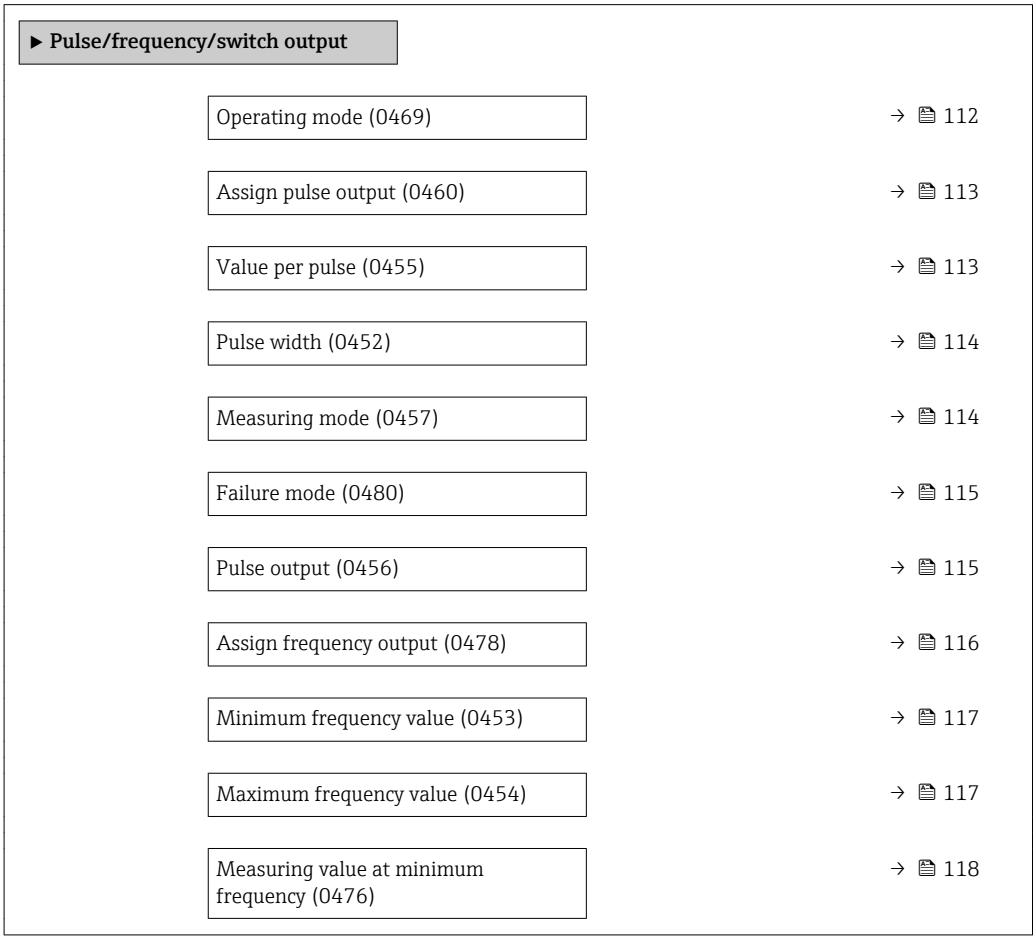
Navigation Expert → Output → Curr.output 1 → Terminal volt. 1 (0662–1)

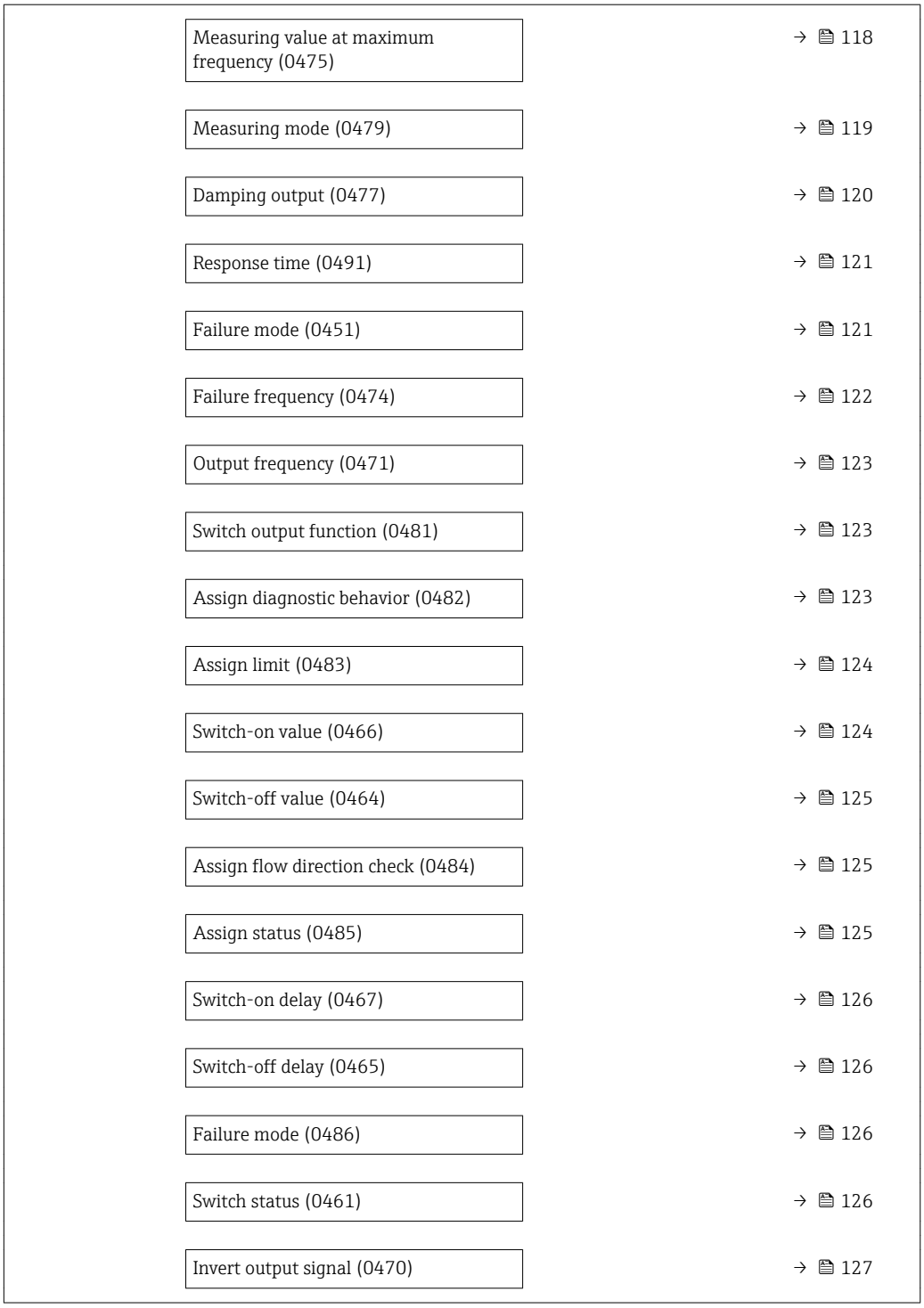
Description Use this function to view the actual terminal voltage that is present at the current output.

User interface 0.0 to 50.0 V

3.4.2 "Pulse/frequency/switch output" submenu

Navigation Expert → Output → PFS output





Operating mode

Navigation Expert → Output → PFS output → Operating mode (0469)

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

Assign pulse output

Navigation Expert → Output → PFS output → Assign pulse (0460)

Prerequsite In the **Operating mode** parameter (→ 112) the **Pulse** option is selected.

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

Selection
- Off
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *

Factory setting Off

Value per pulse

Navigation Expert → Output → PFS output → Value per pulse (0455)

Prerequsite One of the following options is selected in the **Assign pulse output** parameter (→ 113):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *

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

User entry Signed floating-point number

Factory setting Depends on country and nominal diameter

* Visibility depends on order options or device settings

Pulse width

Navigation Expert → Output → PFS output → Pulse width (0452)

Prerequisite One of the following options is selected in the **Assign pulse output** parameter (→ 113):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *

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

User entry 5 to 2 000 ms

Factory setting 100 ms

Measuring mode

Navigation Expert → Output → PFS output → Measuring mode (0457)

Prerequisite One of the following options is selected in the **Assign pulse output** parameter (→ 113):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *

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

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

Factory setting Forward flow

Additional information *Options*

For a detailed description of the options available, see the **Measuring mode** parameter (→ 102)

Examples

For a detailed description of the configuration examples, see the **Measuring mode** parameter (→ 102)

* Visibility depends on order options or device settings

Failure mode

Navigation Expert → Output → PFS output → Failure mode (0480)

Prerequsite One of the following options is selected in the **Assign pulse output** parameter (→ 113):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *

Description Use this function to select an output behavior in the event of a device alarm.

Selection
- Actual value
- No pulses

Factory setting No pulses

Pulse output

Navigation Expert → Output → PFS output → Pulse output (0456)

Prerequsite The **Pulse** option is selected in the **Operating mode** parameter (→ 112).

Description Displays the pulse frequency currently output.

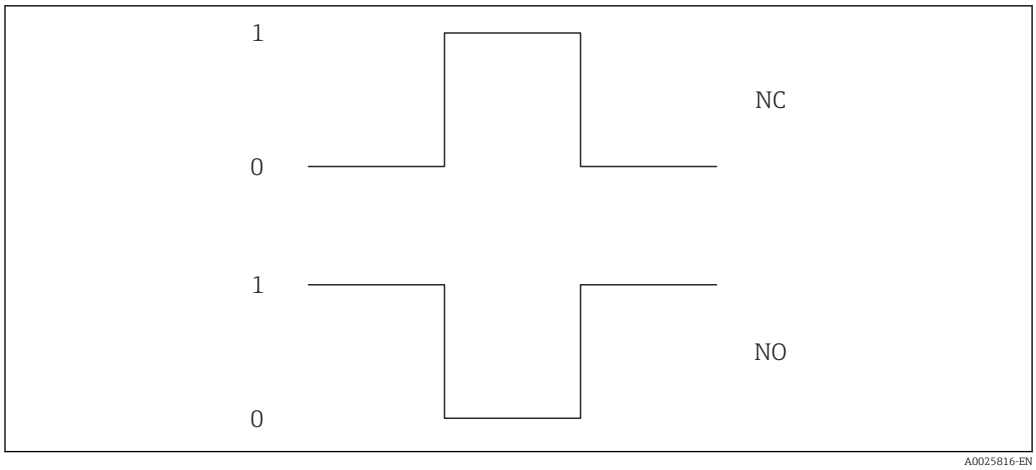
User interface Positive floating-point number

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.

The value (i.e. the amount of the measured value) that a pulse corresponds to and the duration of the pulse can be defined using the **Value per pulse** parameter (→ 113) and the **Pulse width** parameter (→ 114).

* Visibility depends on order options or device settings



0 Non-conductive
1 Conductive
NC Normally closed
NO Normally opened

The output behavior can be reversed using the **Invert output signal** parameter (→ 127), i.e. the transistor is not conductive for the duration of the pulse.

In addition, the behavior of the output can be configured in the event of an error (**Failure mode** parameter (→ 115)).

Assign frequency output

Navigation Expert → Output → PFS output → Assign freq. (0478)

Prerequsite The **Frequency** option is selected in the **Operating mode** parameter (→ 112).

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

Selection
- Off
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Methane fraction *
- Wobbe index *
- Calorific value *
- Temperature *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

Factory setting Off

* Visibility depends on order options or device settings

Minimum frequency value

Navigation Expert → Output → PFS output → Min. freq. value (0453)

Prerequsite One of the following options is selected in the **Assign frequency output** parameter (→ 116):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Methane fraction *
- Wobbe index *
- Calorific value *
- Temperature *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

Description Use this function to enter the start value frequency.

User entry 0 to 1 000 Hz

Factory setting 0 Hz

Maximum frequency value

Navigation Expert → Output → PFS output → Max. freq. value (0454)

Prerequsite One of the following options is selected in the **Assign frequency output** parameter (→ 116):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Methane fraction *
- Wobbe index *
- Calorific value *
- Temperature *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

* Visibility depends on order options or device settings

Description Use this function to enter the end value frequency.

User entry 0 to 1 000 Hz

Factory setting 1 000 Hz

Measuring value at minimum frequency

Navigation Expert → Output → PFS output → Val. at min.freq (0476)

Prerequsite One of the following options is selected in the **Assign frequency output** parameter (→ 116):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Methane fraction *
- Wobbe index *
- Calorific value *
- Temperature *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

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 (→ 116).

Measuring value at maximum frequency

Navigation Expert → Output → PFS output → Val. at max.freq (0475)

Prerequsite One of the following options is selected in the **Assign frequency output** parameter (→ 116):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *

* Visibility depends on order options or device settings

- Mass flow
- Energy flow *
- Methane fraction *
- Wobbe index *
- Calorific value *
- Temperature *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

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 *Dependency*

The entry depends on the process variable selected in the **Assign frequency output** parameter (→ 116).

Measuring mode

Navigation Expert → Output → PFS output → Measuring mode (0479)

Prerequsite One of the following options is selected in the **Assign frequency output** parameter (→ 116):

- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Methane fraction *
- Wobbe index *
- Calorific value *
- Temperature *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

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

* Visibility depends on order options or device settings

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 (→ 102)

Examples

For a detailed description of the configuration examples, see the **Measuring mode** parameter (→ 102)

Damping output

Navigation
Expert → Output → PFS output → Damping out. (0477)

Prerequsite
One of the following options is selected in the **Assign frequency output** parameter (→ 116):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Methane fraction *
- Wobbe index *
- Calorific value *
- Temperature *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

Description
Use this function to enter 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

* Visibility depends on order options or device settings

Response time

Navigation Expert → Output → PFS output → Response time (0491)

Prerequisite One of the following options is selected in the **Assign frequency output** parameter (→ 116):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Methane fraction *
- Wobbe index *
- Calorific value *
- Temperature *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

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

User interface Positive floating-point number

Additional information *Description*

The response time is made up of the time specified for the following dampings:
- Damping of pulse/frequency/switch output → 106
  and
- Depending on the measured variable assigned to the output.
  - Flow damping
    or
  - Temperature damping
    or
  - Dry methane damping

Failure mode

Navigation Expert → Output → PFS output → Failure mode (0451)

Prerequisite One of the following options is selected in the **Assign frequency output** parameter (→ 116):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Methane fraction *

* Visibility depends on order options or device settings

- Wobbe index *
- Calorific value *
- Temperature *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

Description Use this function to select an output behavior in the event of a device alarm.

Selection
- Actual value
- Defined value
- 0 Hz

Factory setting 0 Hz

Failure frequency

Navigation Expert → Output → PFS output → Failure freq. (0474)

Prerequsite One of the following options is selected in the **Assign frequency output** parameter (→ 116):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Methane fraction *
- Wobbe index *
- Calorific value *
- Temperature *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

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

User entry 0.0 to 1250.0 Hz

Factory setting 0.0 Hz

* Visibility depends on order options or device settings

Output frequency

Navigation Expert → Output → PFS output → Output freq. (0471)

Prerequsite The **Frequency** option is selected in the **Operating mode** parameter (→ 112).

Description Use this function to view the actual value of the output frequency which is currently measured.

User interface 0 to 1 250 Hz

Switch output function

Navigation Expert → Output → PFS output → Switch out funct (0481)

Prerequsite The **Switch** option is selected in the **Operating mode** parameter (→ 112).

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

Selection
- Off
- On
- Diagnostic behavior
- Limit
- Flow direction check
- Status

Factory setting Off

Assign diagnostic behavior

Navigation Expert → Output → PFS output → Assign diag. beh (0482)

Prerequsite The **Diagnostic behavior** option is selected in the **Switch output function** parameter (→ 123).

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

Selection
- Alarm
- Alarm or warning
- Warning

Factory setting Alarm

Assign limit

Navigation Expert → Output → PFS output → Assign limit (0483)

Prerequisite In the **Switch output function** parameter (→ 123) the **Limit** option is selected.

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

Selection
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Methane fraction *
- Wobbe index *
- Calorific value *
- Temperature *
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

Factory setting Volume flow

Switch-on value

Navigation Expert → Output → PFS output → Switch-on value (0466)

Prerequisite In the **Switch output function** parameter (→ 123) the **Limit** option is selected.

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

User entry Signed floating-point number

Factory setting Country-specific:
- 0 m^3/h
- 0 ft^3/h

Additional information *Dependency*

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

* Visibility depends on order options or device settings

Switch-off value

Navigation Expert → Output → PFS output → Switch-off value (0464)

Prerequsite In the **Switch output function** parameter (→ 123) the **Limit** option is selected.

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

User entry Signed floating-point number

Factory setting Country-specific:
- 0 m^3/h
- 0 ft^3/h

Additional information *Dependency*

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

Assign flow direction check

Navigation Expert → Output → PFS output → Assign dir.check (0484)

Prerequsite The **Flow direction check** option is selected in the **Switch output function** parameter (→ 123).

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

Selection
- Off
- Volume flow
- Corrected volume flow
- Corrected methane volume flow
- Mass flow
- Energy flow

Factory setting Volume flow

Assign status

Navigation Expert → Output → PFS output → Assign status (0485)

Prerequsite The **Status** option is selected in the **Switch output function** parameter (→ 123).

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

Selection Low flow cut off

Factory setting Low flow cut off

Switch-on delay

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

Prerequsite The **Limit** option is selected in the **Switch output function** parameter (→ 123).

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 → Switch-off delay (0465)

Prerequsite The **Limit** option is selected in the **Switch output function** parameter (→ 123).

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 → Failure mode (0486)

Description Use this function to select an output behavior in the event of a device alarm.

Selection
- Actual status
- Open
- Closed

Factory setting Open

Switch status

Navigation Expert → Output → PFS output → Switch status (0461)

Prerequsite The **Switch** option is selected in the **Operating mode** parameter (→ 112).

Description Use this function to view the current switch status of the status output.

User interface
- Open
- Closed

Invert output signal

Navigation Expert → Output → PFS output → Invert outp.sig. (0470)

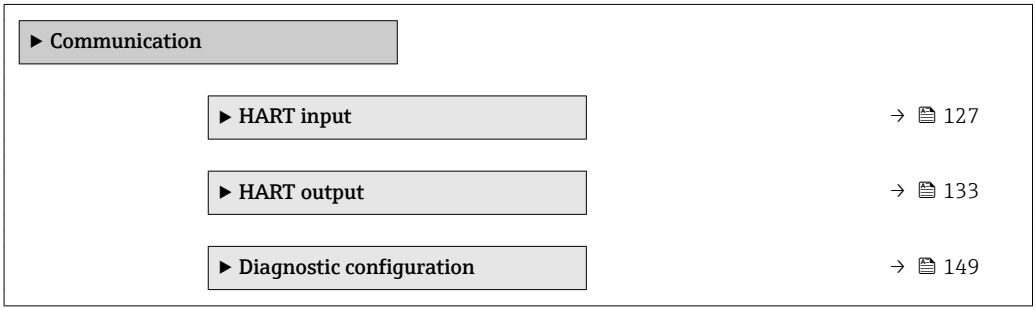
Description Use this function to select whether to invert the output signal.

Selection
- No
- Yes

Factory setting No

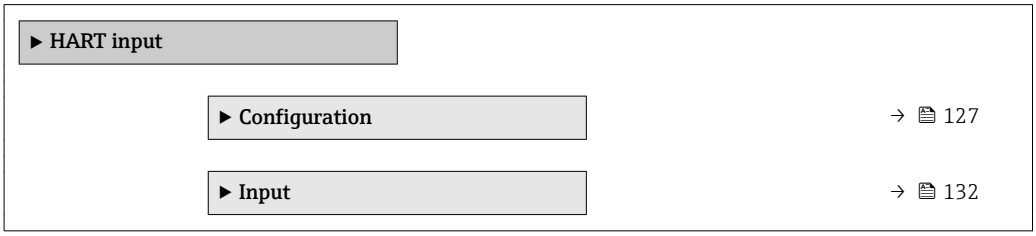
3.5 "Communication" submenu

Navigation Expert → Communication



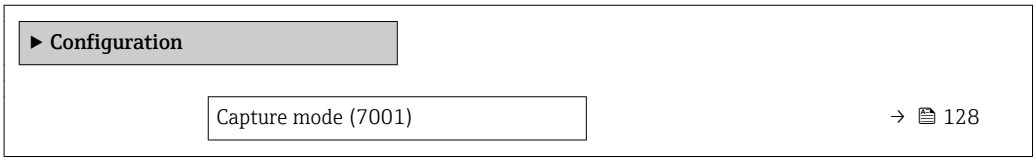
3.5.1 "HART input" submenu

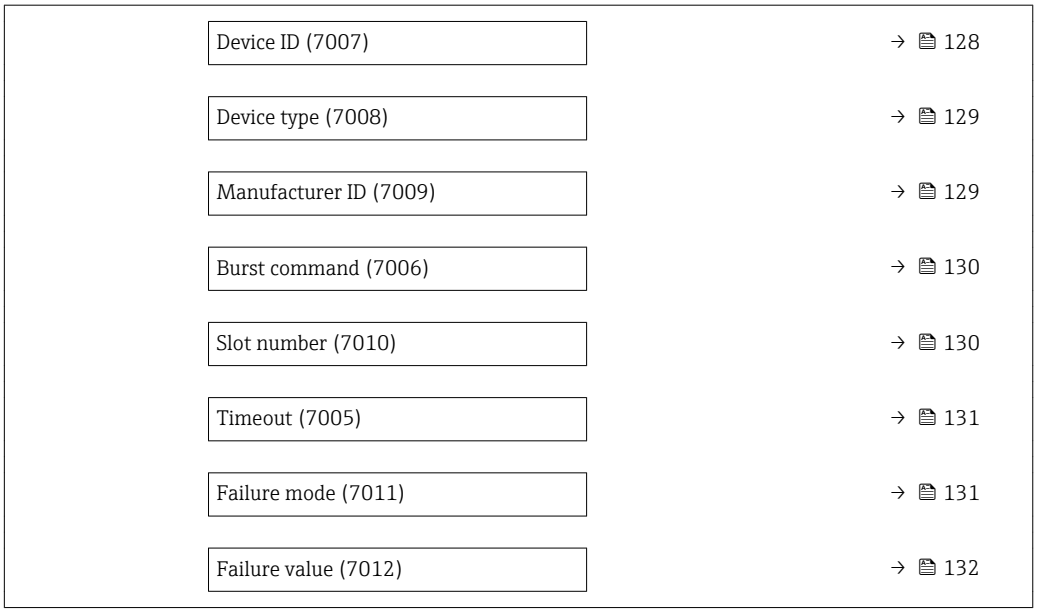
Navigation Expert → Communication → HART input



"Configuration" submenu

Navigation Expert → Communication → HART input → Configuration





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 also be in 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)

Prerequsite The **Master network** option is selected in the **Capture mode** parameter (→ 128).

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:
- 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)

Prerequsite The **Master network** option is selected in the **Capture mode** parameter (→ 128).

Description Use this function to enter the device type of the HART slave device whose data are to be recorded.

User entry 4-digit hexadecimal number

Factory setting 0x1138

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)

Prerequsite The **Master network** option is selected in the **Capture mode** parameter (→ 128).

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 (→ 128).

Description Use this function to select the burst command to be recorded.

Selection
- Command 1
- Command 3
- Command 9
- Command 33

Factory setting Command 1

Additional information *Selection*
- 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 In **Capture mode** parameter (→ 128), **Burst network** option or **Master network** option is selected.

Description Use this function to enter the position of the process variable to be determined in burst command.

User entry 1 to 8

Factory setting 1

Additional information *User entry*

Slot	Command			
	1	3	9	33
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)	–

Slot	Command			
	1	3	9	33
7	–	–	HART variable (slot 7)	–
8	–	–	HART variable (slot 8)	–

Timeout

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

Prerequsite In the **Capture mode** parameter (→ 128), the **Burst network** option or **Master network** option is selected.

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 diagnostic message **F410 Data transfer**.

Failure mode

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

Prerequsite In the **Capture mode** parameter (→ 128), 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 (→ 132)).

Failure value

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

Prerequisite The following conditions are met:
- In the **Capture mode** parameter (→ 128), the **Burst network** option or **Master network** option is selected.
- In the **Failure mode** parameter (→ 131), 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

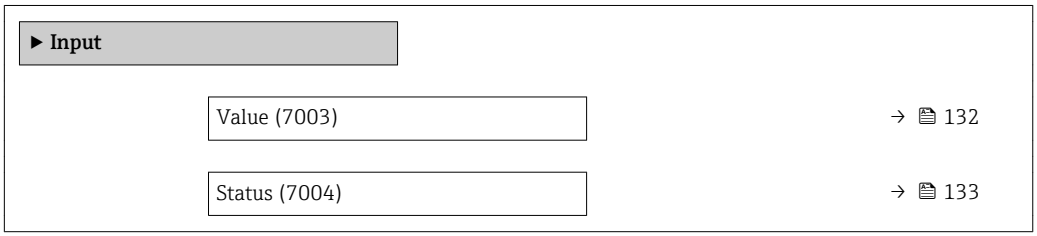
Factory setting 1013.25 mbar

Additional information *Dependency*

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

"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

Additional information *Dependency*

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

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.

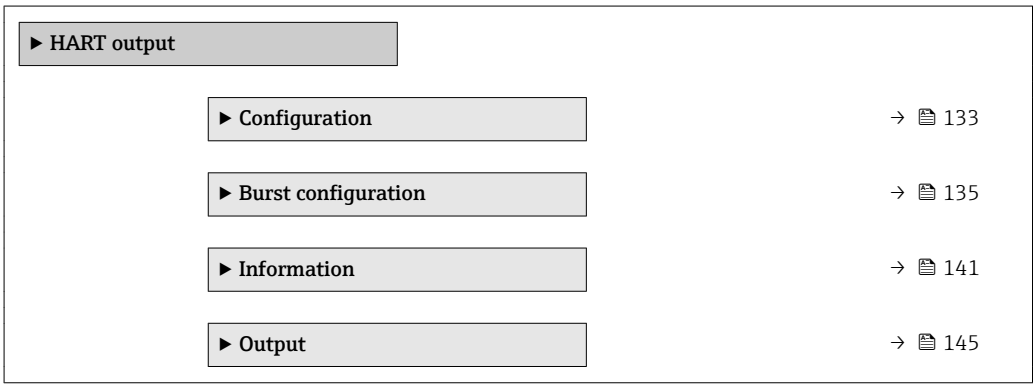
User interface
- Manual/Fixed
- Good
- Poor accuracy
- Bad

Additional information *Description*

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

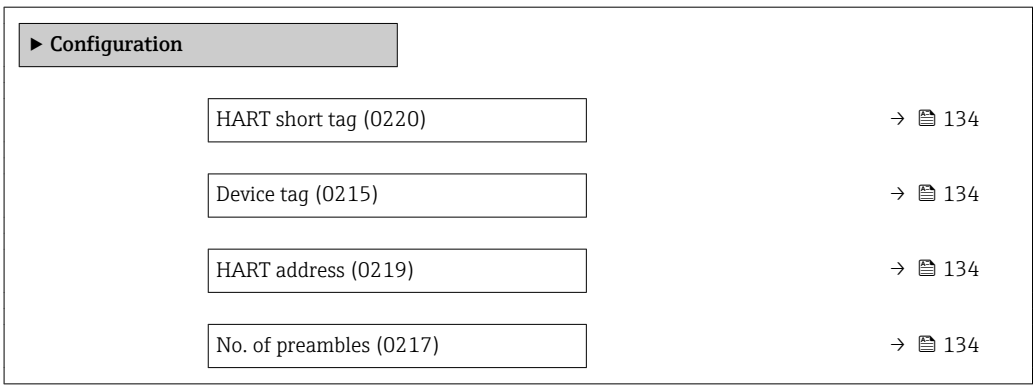
3.5.2 "HART output" submenu

Navigation Expert → Communication → HART output



"Configuration" submenu

Navigation Expert → Communication → HART output → Configuration



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-Z, 0-9 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

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

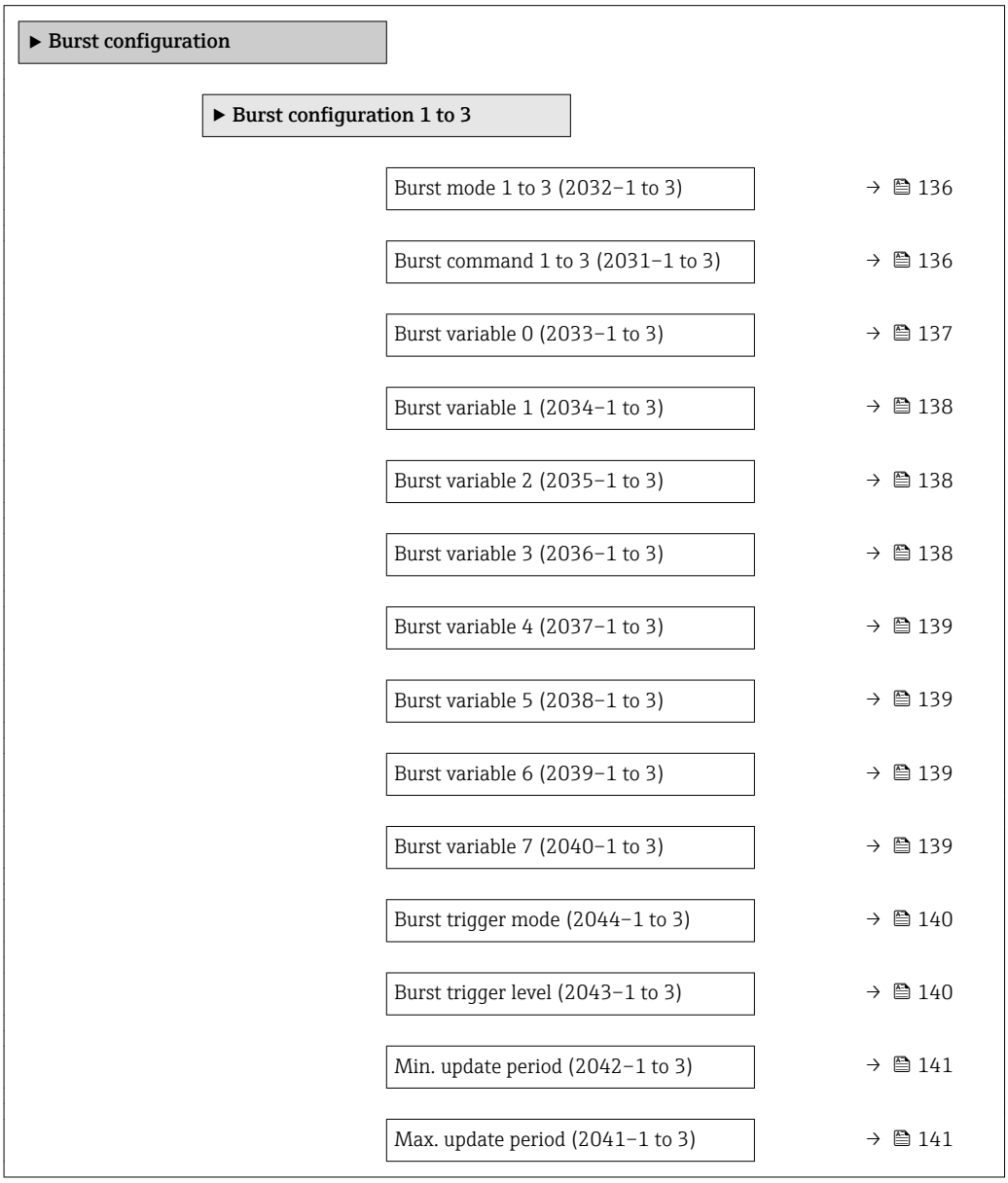
Factory setting 5

Additional information *User entry*

As every modem component can "swallow" a byte, 2-byte preambles at least must be defined.

"Burst configuration" submenu

Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to 3



Burst mode 1 to 3

Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to 3 → Burst mode 1 to 3 (2032–1 to 3)

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 3

Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to 3 → Burst command 1 to 3 (2031–1 to 3)

Description Use this function to select the HART command that is sent to the HART master.

Selection
- Command 1
- Command 2
- Command 3
- Command 9
- Command 33
- Command 48

Factory setting Command 2

Additional information *Options*
- 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
- Signal asymmetry *
- Acceptance rate *
- Turbulence *
- Signal strength *
- Signal to noise ratio *
- Percent Of Range
- Measured current
- Primary variable (PV)
- 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 (→ 96).

Burst variable 0

Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to 3 → Burst variable 0 (2033–1 to 3)

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

Selection
- Volume flow
- Mass flow
- Energy flow
- Methane fraction
- Calorific value
- Wobbe index
- Corrected volume flow
- Corrected methane volume flow
- Temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Pressure
- Sound velocity
- Flow velocity
- Signal asymmetry *
- Acceptance rate *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

* Visibility depends on order options or device settings

- Percent Of Range
- Measured current
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

Factory setting Volume flow

Burst variable 1

Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to 3 → Burst variable 1 (2034–1 to 3)

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

Selection See **Burst variable 0** parameter (→ 137).

Factory setting Not used

Burst variable 2

Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to 3 → Burst variable 2 (2035–1 to 3)

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

Selection See **Burst variable 0** parameter (→ 137).

Factory setting Not used

Burst variable 3

Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to 3 → Burst variable 3 (2036–1 to 3)

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

Selection See **Burst variable 0** parameter (→ 137).

Factory setting Not used

Burst variable 4

Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to 3 → Burst variable 4 (2037–1 to 3)

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

Selection See **Burst variable 0** parameter (→ 137).

Factory setting Not used

Burst variable 5

Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to 3 → Burst variable 5 (2038–1 to 3)

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

Selection See **Burst variable 0** parameter (→ 137).

Factory setting Not used

Burst variable 6

Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to 3 → Burst variable 6 (2039–1 to 3)

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

Selection See **Burst variable 0** parameter (→ 137).

Factory setting Not used

Burst variable 7

Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to 3 → Burst variable 7 (2040–1 to 3)

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

Selection See **Burst variable 0** parameter (→ 137).

Factory setting Not used

Burst trigger mode

Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to 3 → Trigger mode (2044–1 to 3)

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

Selection
- Continuous
- Window
- Rising
- Falling
- On change

Factory setting Continuous

Additional information *Options*
- Continuous
  The message is sent continuously, at least at intervals corresponding to the time frame specified in the **Burst min period** parameter (→ 141).
- Window
  The message is sent if the specified measured value has changed by the value in the **Burst trigger level** parameter (→ 140).
- Rising
  The message is sent if the specified measured value exceeds the value in the **Burst trigger level** parameter (→ 140).
- Falling
  The message is sent if the specified measured value drops below the value in the **Burst trigger level** parameter (→ 140).
- 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 3 → Trigger level (2043–1 to 3)

Description For entering the burst trigger value.

User entry Positive floating-point number

Additional information *Description*

Together with the option selected in the **Burst trigger mode** parameter (→ 140) the burst trigger value determines the time of burst message X.

Min. update period

Navigation Expert → Communication → HART output → Burst config. → Burst config. 1 to 3 → Min. upd. per. (2042–1 to 3)

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 3 → Max. upd. per. (2041–1 to 3)

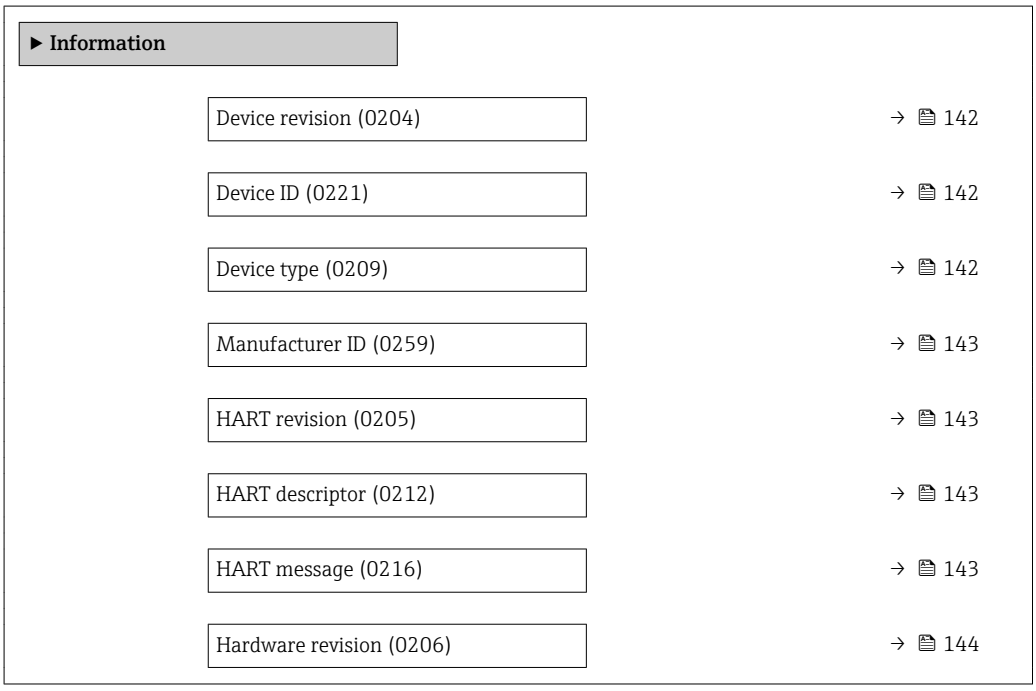
Description Use this function to enter the maximum time span between two burst commands of burst message X.

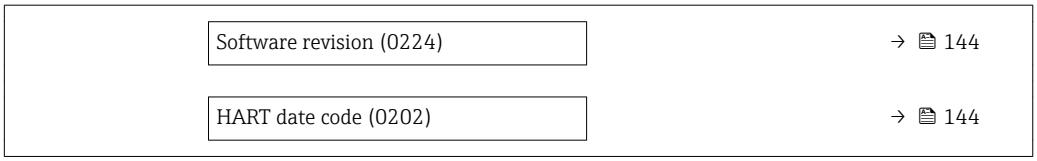
User entry Positive integer

Factory setting 2 000 ms

"Information" submenu

Navigation Expert → Communication → HART output → Information





Device revision

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

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

User interface 2-digit hexadecimal number

Factory setting 0x03

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 0x5A (for Prosonic Flow B 200)

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. Flow B 200

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. Flow B 200

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.

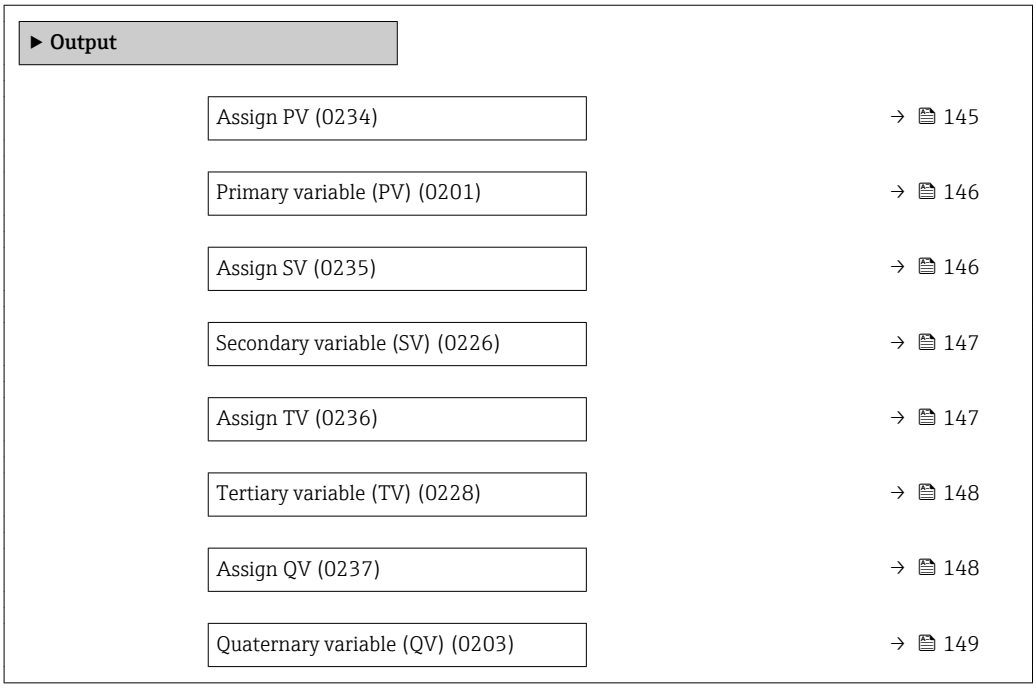
User entry Date entry format: yyyy-mm-dd

Factory setting 2009-07-20

Additional information *Example*
Device installation date

"Output" submenu

Navigation Expert → Communication → HART output → Output



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
- Mass flow
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Temperature *
- Energy flow *
- Methane fraction *
- Calorific value *
- Wobbe index *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

* Visibility depends on order options or device settings

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

User interface

The measured value displayed depends on the process variable selected in the **Assign PV** parameter (→ 145).

Dependency

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

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
- Mass flow
- Energy flow *
- Methane fraction *
- Calorific value *
- Wobbe index *
- Corrected volume flow
- Corrected methane volume flow *
- Temperature *
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Pressure
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

* Visibility depends on order options or device settings

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

Additional information

User interface

The measured value displayed depends on the process variable selected in the **Assign SV** parameter (→ 146).

Dependency

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

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
- Mass flow
- Energy flow *
- Methane fraction *
- Calorific value *
- Wobbe index *
- Corrected volume flow
- Corrected methane volume flow *
- Temperature *
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Pressure
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

* 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

User interface

The measured value displayed depends on the process variable selected in the **Assign TV** parameter (→ 147).

Dependency

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

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

- Volume flow
- Mass flow
- Energy flow *
- Methane fraction *
- Calorific value *
- Wobbe index *
- Corrected volume flow
- Corrected methane volume flow *
- Temperature *
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Pressure
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *

* Visibility depends on order options or device settings

Quaternary variable (QV)

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

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

User interface Signed floating-point number

Additional information *User interface*

The measured value displayed depends on the process variable selected in the **Assign QV** parameter (→ 148).

Dependency

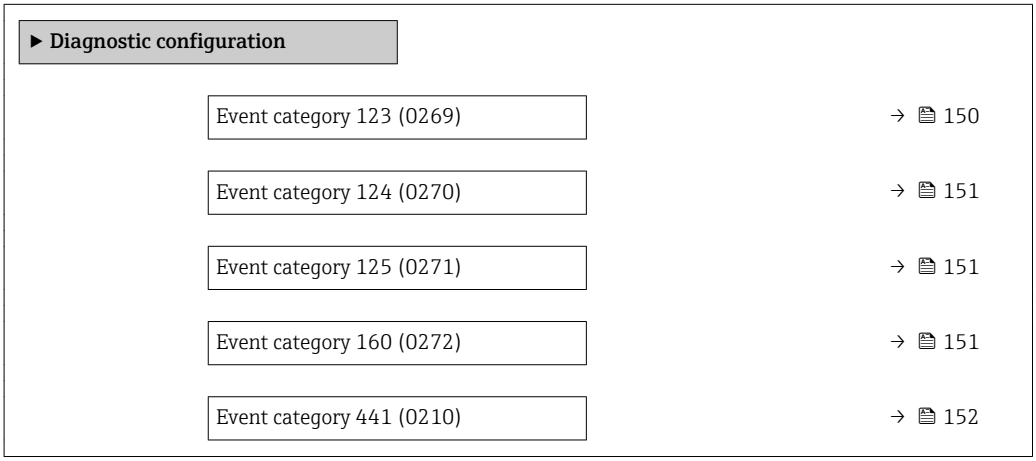
The unit of the displayed measured value is taken from the **System units** submenu (→ 58).

3.5.3 "Diagnostic configuration" submenu

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

Assign a category to the particular diagnostic event:
- **Failure (F)** option
  A device error has occurred. The measured value is no longer valid.
- **Function check (C)** option
  The device is in service mode (e.g. during a simulation).
- **Out of specification (S)** option
  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)** option
  Maintenance is required. The measured value is still valid.
- **No effect (N)** option
  Has no effect on the condensed status.

Navigation Expert → Communication → Diag. config.



Event category 123 (Predicted signal strength)

Navigation Expert → Communication → Diag. config. → Event category 123 (0269)

Description Use this option to select a category for the diagnostic message **123 Predicted signal strength**.

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 options available for selection: → 149

Event category 124 (Relative signal strength)

Navigation Expert → Communication → Diag. config. → Event category 124 (0270)

Description Use this option to select a category for the diagnostic message **124 Relative signal strength**.

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 options available for selection: → 149

Event category 125 (Relative sound velocity)

Navigation Expert → Communication → Diag. config. → Event category 125 (0271)

Description Use this option to select a category for the diagnostic message **125 Relative sound velocity**.

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 options available for selection: → 149

Event category 160 (Signal path switched off)

Navigation Expert → Communication → Diag. config. → Event category 160 (0272)

Description Use this option to select a category for the diagnostic message **160 Signal path switched off**.

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 options available for selection: → 149

Event category 441 (Current output 1 to 2)

Navigation Expert → Communication → Diag. config. → Event category 441 (0210)

Description Use this function to select a category for the diagnostic message **441 Current output 1 to 2**.

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 options available for selection: → 149

Event category 442 (Frequency output)

Navigation Expert → Communication → Diag. config. → Event category 442 (0230)

Prerequisite The pulse/frequency/switch output is available.

Description Use this function to select the category assigned to diagnostic message **442 Frequency output**.

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 options available for selection: → 149

Event category 443 (Pulse output)

Navigation Expert → Communication → Diag. config. → Event category 443 (0231)

Prerequisite The pulse/frequency/switch output is available.

Description Use this function to select the category assigned to diagnostic message **443 Pulse output**.

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 options available for selection: → 149

Event category 444 (Current input 1)

Navigation Expert → Communication → Diag. config. → Event category 444 (0211)

Prerequsite The current input is available.

Description Use this function to select a category for the diagnostic message **444 Current input 1**.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting Out of specification (S)

Additional information *Options*

For a detailed description of the options available for selection: → 149

Event category 452 (Calculation error)

Navigation Expert → Communication → Diag. config. → Event category 452 (0265)

Description Use this option to select a category for the diagnostic message **452 Calculation error**.

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 options available for selection: → 149

Event category 801 (Supply voltage too low)

Navigation Expert → Communication → Diag. config. → Event category 801 (0232)

Description Use this function to select the category assigned to diagnostic message **801 Supply voltage too low**.

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 options available for selection: → 149

Event category 832 (Electronic temperature too high)

Navigation Expert → Communication → Diag. config. → Event category 832 (0218)

Description Use this function to select the category assigned to diagnostic message **832 Electronic temperature too high**.

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 options available for selection: → 149

Event category 833 (Electronic temperature too low)

Navigation Expert → Communication → Diag. config. → Event category 833 (0225)

Description Use this function to select the category assigned to diagnostic message **833 Electronic temperature too low**.

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 options available for selection: → 149

Event category 834 (Process temperature too high)

Navigation Expert → Communication → Diag. config. → Event category 834 (0227)

Description Use this function to select a category for the diagnostic message **834 Process temperature too high**.

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 options available for selection: → 149

Event category 835 (Process temperature too low)

Navigation Expert → Communication → Diag. config. → Event category 835 (0229)

Description Use this function to select a category for the diagnostic message **835 Process temperature too low**.

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 options available for selection: → 149

Event category 837 (Process pressure)

Navigation Expert → Communication → Diag. config. → Event category 837 (0266)

Description Use this option to select a category for the diagnostic message **837 Process pressure**.

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 options available for selection: → 149

Event category 841 (Sensor range)

Navigation Expert → Communication → Diag. config. → Event category 841 (0267)

Description Use this option to select a category for the diagnostic message **841 Sensor range**.

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 options available for selection: → 149

Event category 881 (Sensor signal path 1 to 2)

Navigation Expert → Communication → Diag. config. → Event category 881 (0268)

Description Use this option to select a category for the diagnostic message **881 Sensor signal path 1 to 2**.

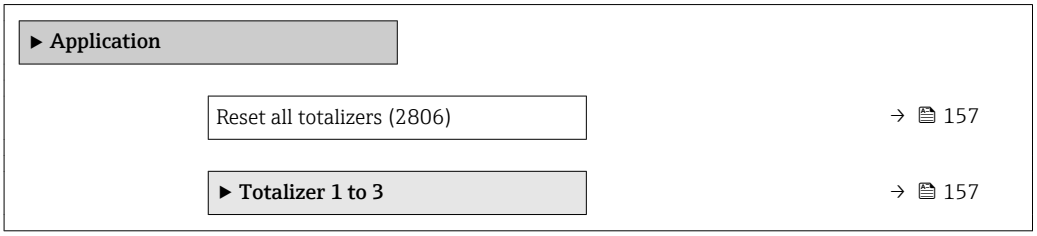
Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Factory setting Maintenance required (M)

Additional information For a detailed description of the options available for selection: → 149

3.6 "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 flow values previously totalized.

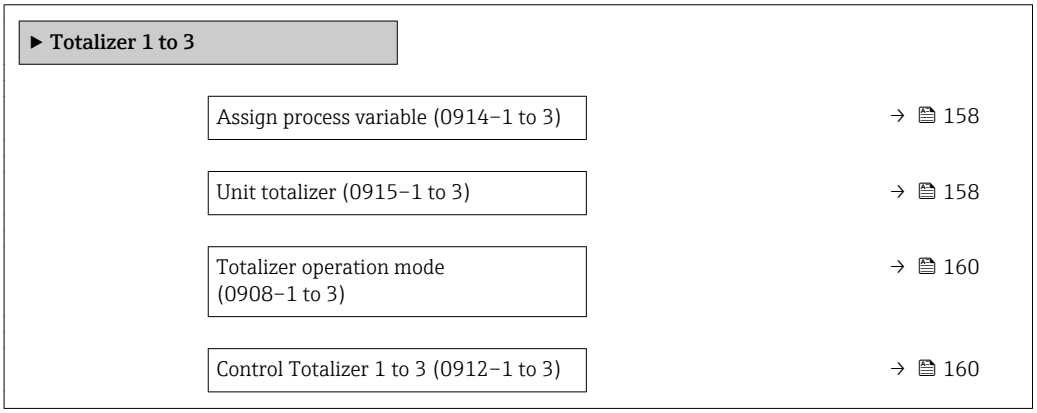
Selection
- Cancel
- Reset + totalize

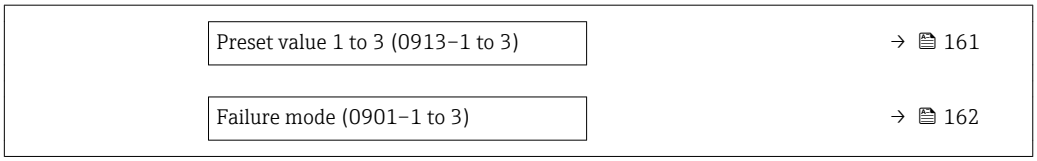
Factory setting Cancel

Additional information *Selection*
- Cancel
  No action is executed and the user exits the parameter.
- Reset + totalize
  All totalizers are reset to 0 and the totaling process is restarted.

3.6.1 "Totalizer 1 to 3" submenu

Navigation Expert → Application → Totalizer 1 to 3





Assign process variable

Navigation Expert → Application → Totalizer 1 to 3 → Assign variable (0914–1 to 3)

Description Use this function to select a process variable for totalizer 1-3.

Selection
- Off
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Off
- Volume flow
- Corrected volume flow
- Corrected methane 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 **Assign process variable** parameter (→ 158) is displayed in the **Totalizer 1 to 3** submenu. All other parameters in the submenu are hidden.

Unit totalizer

Navigation Expert → Application → Totalizer 1 to 3 → Unit totalizer (0915–1 to 3)

Prerequsite One of the following options is selected in the **Assign process variable** parameter (→ 158) of the **Totalizer 1 to 3** submenu:
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *

* Visibility depends on order options or device settings

Description

Use this function to select the unit for the process variable of totalizer 1-3.

Selection

SI units
- g
- kg
- t

US units
- oz
- lb
- STon

Custom-specific units
User mass

or

SI units
- dm^3
- m^3
- l

US units
ft^3

Imperial units
bbl (imp;beer)

Custom-specific units
User vol.

or

SI units
- Nl
- Nm^3
- Sm^3

US units
Sft^3

Custom-specific units
UserCrVol.

or

SI units
- kWh
- MWh
- GWh
- kJ
- MJ
- GJ
- kcal
- Mcal
- Gcal

Imperial units
- Btu
- MBtu
- MMBtu

Custom-specific units
User en.

Factory setting

Country-specific:
- m^3
- ft^3

Additional information

Description

The unit is selected separately for each totalizer. It is independent of the option selected in the **System units** submenu (→ 58).

Options

The selection depends on the process variable selected in the **Assign process variable** parameter (→ 158).

Totalizer operation mode

Navigation Expert → Application → Totalizer 1 to 3 → Operation mode (0908–1 to 3)

Prerequsite One of the following options is selected in the **Assign process variable** parameter (→ 158) of the **Totalizer 1 to 3** submenu:
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *

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

Selection
- Net flow total
- Forward flow total
- Reverse flow total

Factory setting Net flow total

Additional information *Options*
- Net flow total
  Positive and negative flow values 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 against the forward flow direction is totalized (= reverse flow total).

Control Totalizer 1 to 3

Navigation Expert → Application → Totalizer 1 to 3 → Control Tot. 1 to 3 (0912–1 to 3)

Prerequsite One of the following options is selected in the **Assign process variable** parameter (→ 158) of the **Totalizer 1 to 3** submenu:
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *

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

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

* Visibility depends on order options or device settings

Factory setting Totalize

Additional information *Options*

- Totalize
  The totalizer is started or continues totalizing with the current counter reading.
- Reset + hold
  The totaling process is stopped and the totalizer is reset to 0.
- Preset + hold
  The totaling process is stopped and the totalizer is set to its defined start value from the **Preset value** parameter (→ 161).
- Reset + totalize
  The totalizer is reset to 0 and the totaling process is restarted.
- Preset + totalize
  The totalizer is set to the defined start value in the **Preset value** parameter (→ 161)and the totaling process is restarted.
- Hold
  The totaling process is stopped.

Preset value 1 to 3

Navigation Expert → Application → Totalizer 1 to 3 → Preset value 1 to 3 (0913–1 to 3)

Prerequsite One of the following options is selected in the **Assign process variable** parameter (→ 158) of the **Totalizer 1 to 3** submenu:
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *

Description Use this function to enter a start value for totalizer 1-3.

User entry Signed floating-point number

Factory setting Country-specific:
- 0 m^3
- 0 ft^3

Additional information *User entry*

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 158).

Example

This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.

* Visibility depends on order options or device settings

Failure mode

Navigation Expert → Application → Totalizer 1 to 3 → Failure mode (0901–1 to 3)

Prerequsite One of the following options is selected in the **Assign process variable** parameter (→ 158) of the **Totalizer 1 to 3** submenu:
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *

Description Use this function to select how a totalizer behaves in an alarm condition.

Selection
- Stop
- Actual value
- Last valid value

Factory setting Stop

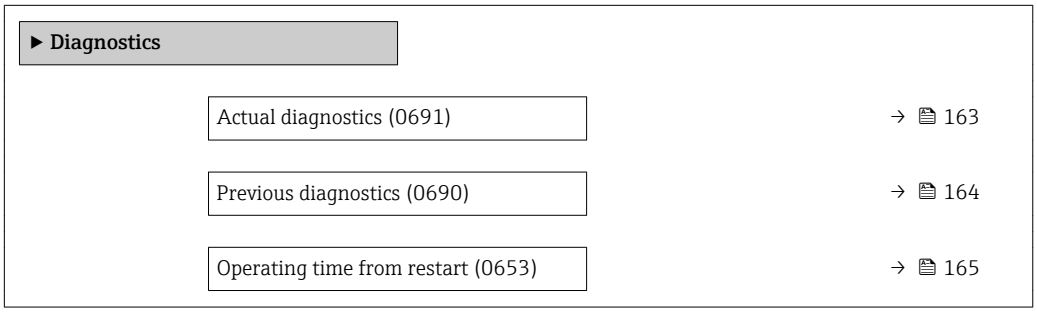
Additional information *Description*

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

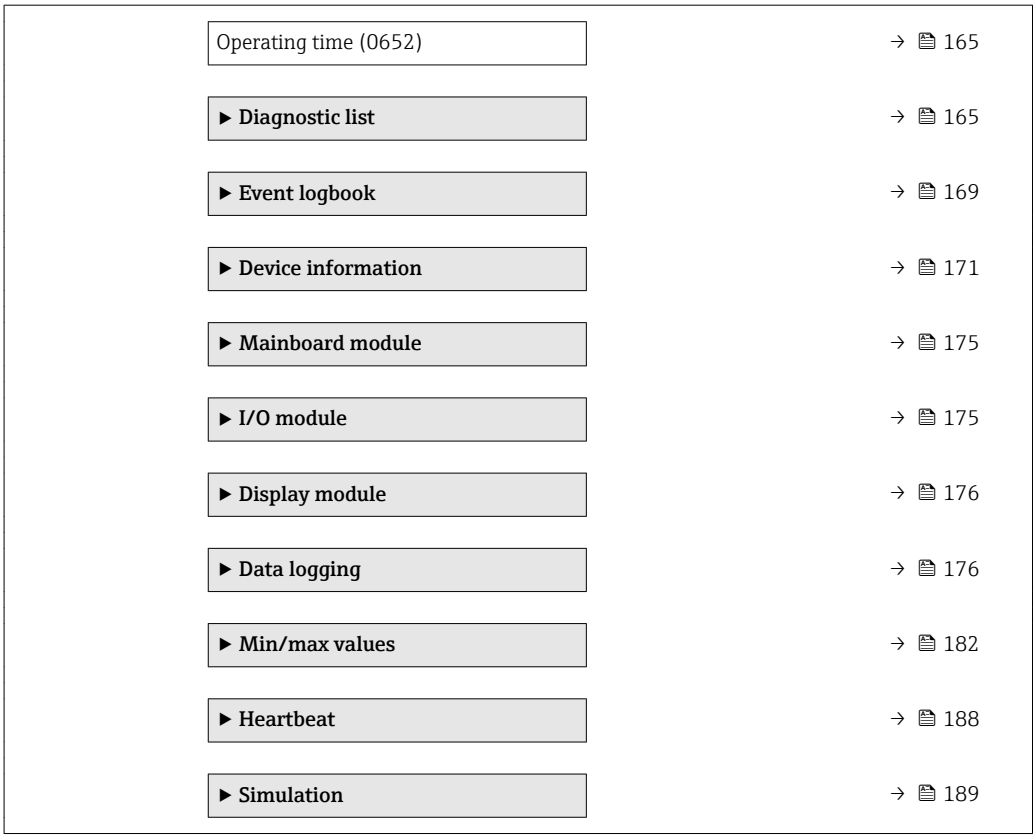
Options
- Stop
  Totalizing is stopped in an alarm condition.
- Actual value
  The totalizer continues to count based on the actual measured value; the error is ignored.
- Last valid value
  The totalizer continues to count based on the last valid measured value before the error occurred.

3.7 "Diagnostics" submenu

Navigation Expert → Diagnostics



* Visibility depends on order options or device settings



Actual diagnostics

Navigation Expert → Diagnostics → Actual diagnos. (0691)

Prerequsite A diagnostic event has occurred.

Description Use this function to display the current diagnostics 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

User interface

Additional pending diagnostic messages can be viewed in the **Diagnostic list** submenu (→ 165).

Information on what is causing the diagnostic message, and remedy measures, can be viewed by pressing the E-button.

Example

For the display format:
⚠S442 Frequency output

Timestamp

Navigation Expert → Diagnostics → Timestamp (0667)

Description Displays the operating time at which the current diagnostic message occurred.

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

Additional information *User interface*

The diagnostic message can be viewed via the **Actual diagnostics** parameter (→ 163).

Example

For the display format:
24d12h13m00s

Previous diagnostics

Navigation Expert → Diagnostics → Prev.diagnostics (0690)

Prerequsite Two diagnostic events have already occurred.

Description Use this function to display the diagnostic message last displayed before the current message.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *User interface*

Information on what is causing the diagnostic message, and remedy measures, can be viewed by pressing the E-button.

Example

For the display format:
⚠S442 Frequency output

Timestamp

Navigation Expert → Diagnostics → Timestamp (0672)

Description Displays the operating time of the last diagnostic message that occurred before the current message.

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

Additional information *User interface*

The diagnostic message can be viewed via the **Previous diagnostics** parameter (→ 164).

Example

For the display format:
24d12h13m00s

Operating time from restart

Navigation Expert → Diagnostics → Time fr. restart (0653)

Description Use this function to display the time the device has been in operation since the last device restart.

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

Operating time

Navigation Expert → Diagnostics → Operating time (0652)

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

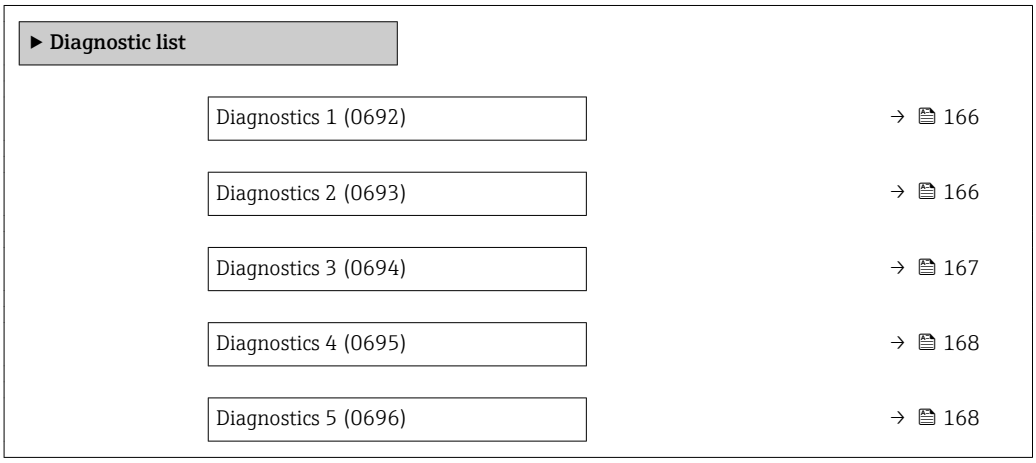
User interface Days (d), hours (h), minutes (m) and seconds (s)

Additional information *User interface*

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

3.7.1 "Diagnostic list" submenu

Navigation Expert → Diagnostics → Diagnostic list



Diagnostics 1

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

Description Use this function to display the current diagnostics message with the highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Examples*

For the display format:
- ⚠S442 Frequency output
- ⊗F276 I/O module failure

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp (0683)

Description Displays the operating time at which the diagnostic message occurred.

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

Additional information *User interface*

The diagnostic message can be viewed via the **Diagnostics 1** parameter (→ 166).

Example

For the display format:
24d12h13m00s

Diagnostics 2

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

Description Use this function to display the current diagnostics message with the second-highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Examples*

For the display format:
- ⚠S442 Frequency output
- ⊗F276 I/O module failure

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp (0684)

Description Displays the operating time at which the diagnostic message occurred.

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

Additional information *User interface*

The diagnostic message can be viewed via the **Diagnostics 2** parameter (→ 166).

Example

For the display format:
24d12h13m00s

Diagnostics 3

Navigation Expert → Diagnostics → Diagnostic list → Diagnostics 3 (0694)

Description Use this function to display the current diagnostics message with the third-highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Examples*

For the display format:
- ⚠S442 Frequency output
- ⊗F276 I/O module failure

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp (0685)

Description Displays the operating time at which the diagnostic message occurred.

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

Additional information *User interface*

The diagnostic message can be viewed via the **Diagnostics 3** parameter (→ 167).

Example

For the display format:
24d12h13m00s

Diagnostics 4

Navigation Expert → Diagnostics → Diagnostic list → Diagnostics 4 (0695)

Description Use this function to display the current diagnostics message with the fourth-highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Examples*

For the display format:
- ⚠S442 Frequency output
- ⊗F276 I/O module failure

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp (0686)

Description Displays the operating time at which the diagnostic message occurred.

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

Additional information *User interface*

The diagnostic message can be viewed via the **Diagnostics 4** parameter (→ 168).

Example

For the display format:
24d12h13m00s

Diagnostics 5

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

Description Use this function to display the current diagnostics message with the fifth-highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Examples*

For the display format:
- ⚠S442 Frequency output
- ⊗F276 I/O module failure

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp (0687)

Description Displays the operating time at which the diagnostic message occurred.

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

Additional information *User interface*

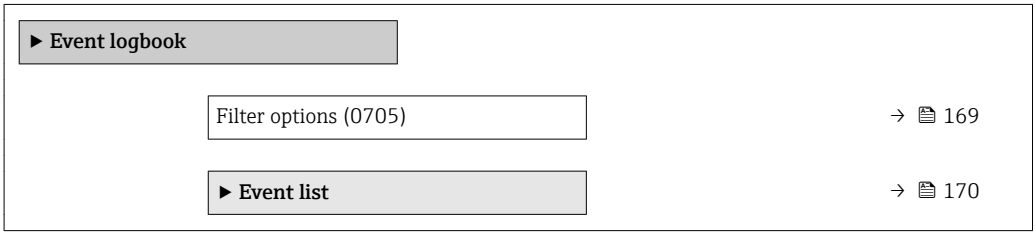
The diagnostic message can be viewed via the **Diagnostics 5** parameter (→ 168).

Example

For the display format:
24d12h13m00s

3.7.2 "Event logbook" submenu

Navigation Expert → Diagnostics → Event logbook



Filter options

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

Description Use this function to select the category whose event messages are displayed in the events list.

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

Navigation Expert → Diagnostics → Event logbook → Event list

Event list

Navigation Expert → Diagnostics → Event logbook → Event list

Description Use this function to display the history of event messages that have occurred in the category selected in the **Filter options** parameter (→ 169).

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

Additional information *Description*

A maximum of 20 event messages are displayed in chronological order. If the advanced HistoROM function 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
- ⚠S442 Frequency output
  ⊕ 01d04h12min30s

Additional information, such as remedial measures, can be called up via the E key.

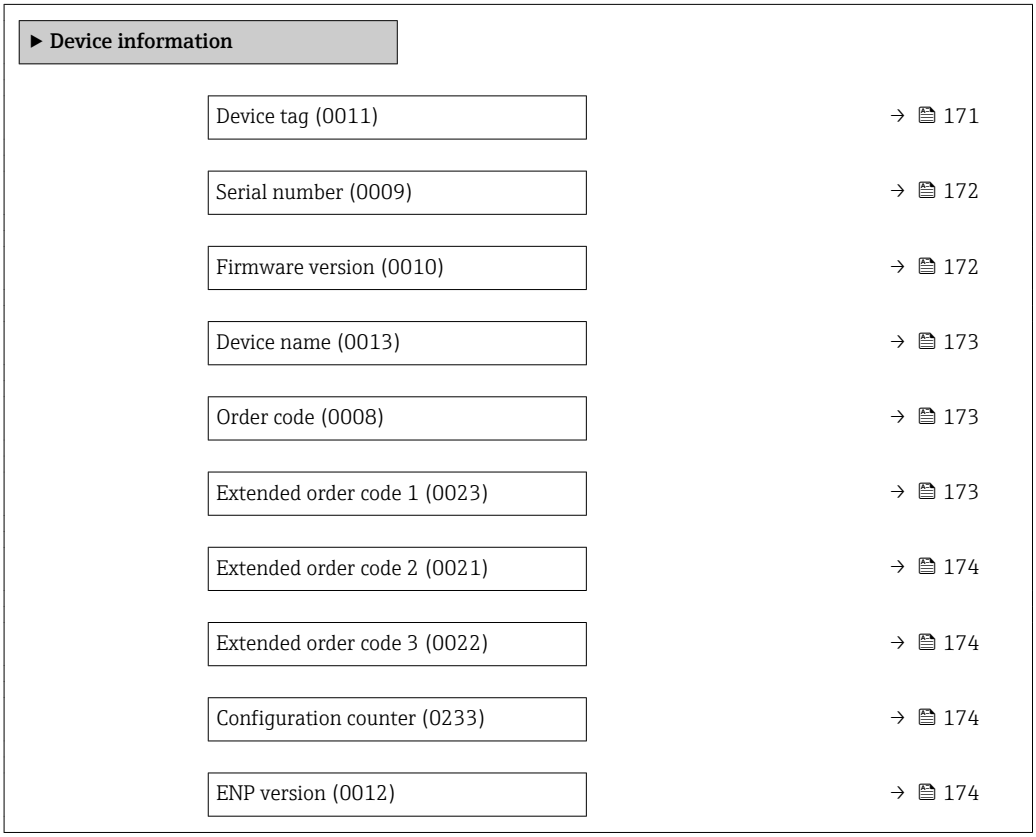
HistoROM

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

To order the **HistoROM advanced capabilities** application package, see the "Accessories" section of the "Technical Information" document.

3.7.3 "Device information" submenu

Navigation Expert → Diagnostics → Device info



Device tag

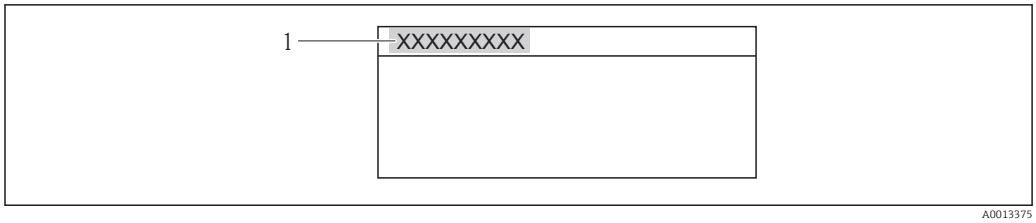
Navigation Expert → Diagnostics → Device info → Device tag (0011)

Description Use this function to display a unique name for the measuring point so it can be identified quickly within the plant. The name is displayed in the header.

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

Factory setting Prosonic Flow

Additional information *User interface*



7 *Header text*

The number of characters displayed depends on the characters used.

Serial number

Navigation Expert → Diagnostics → Device info → Serial number (0009)

Description Use this function to view the serial number of the measuring device. It can also be found on the nameplate of the sensor and transmitter.

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

Factory setting –

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 Use this function to view the device firmware version installed.

User interface Character string with the following format:
xx.yy.zz

Factory setting 01.02

Device name

Navigation Expert → Diagnostics → Device info → Device name (0013)

Description Use this function to view the name of the transmitter. It can also be found on the nameplate of the transmitter.

User interface Pros. Flow B 200

Factory setting –

Order code

Navigation Expert → Diagnostics → Device info → Order code (0008)

Description Use this function to display the device order code.

User interface Character string composed of letters, numbers and certain punctuation marks (e.g. /).

Additional information *Description*

The order code can be found on the nameplate of the sensor and transmitter in the "Order code" field.

The order code is generated from the extended order code through a process of reversible transformation. The extended order code indicates the attributes for all the device features in the product structure. The device features are not directly intelligible 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 For displaying 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 For displaying the second part of the extended order code.

User interface Character string

Additional information For additional information, see **Extended order code 1** parameter (→ 173)

Extended order code 3

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

Description For displaying the third part of the extended order code.

User interface Character string

Additional information For additional information, see **Extended order code 1** parameter (→ 173)

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.

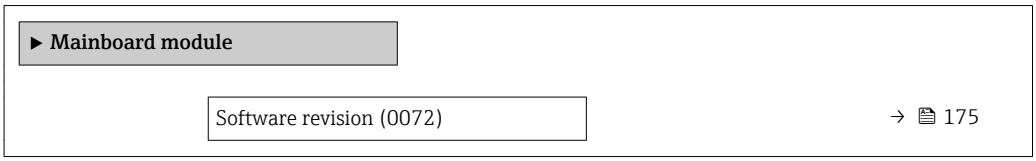
Factory setting 2.02.00

Additional information *Description*

This electronic nameplate stores a data record for device identification that includes more data than the nameplates attached to the outside of the device.

3.7.4 "Mainboard module" submenu

Navigation Expert → Diagnostics → Mainboard module



Software revision

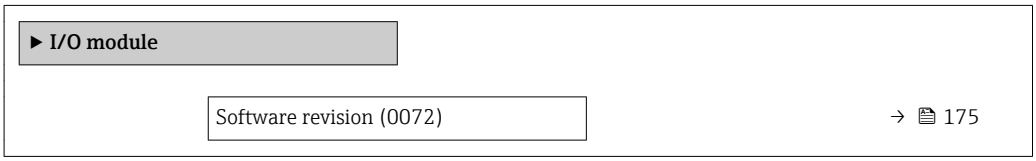
Navigation Expert → Diagnostics → Mainboard module → Software rev. (0072)

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

User interface Positive integer

3.7.5 "I/O module" submenu

Navigation Expert → Diagnostics → I/O module



Software revision

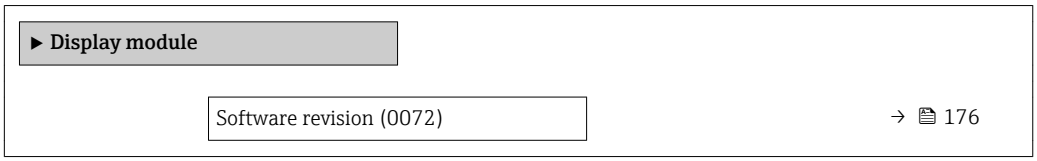
Navigation Expert → Diagnostics → I/O module → Software rev. (0072)

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

User interface Positive integer

3.7.6 "Display module" submenu

Navigation Expert → Diagnostics → Display module



Software revision

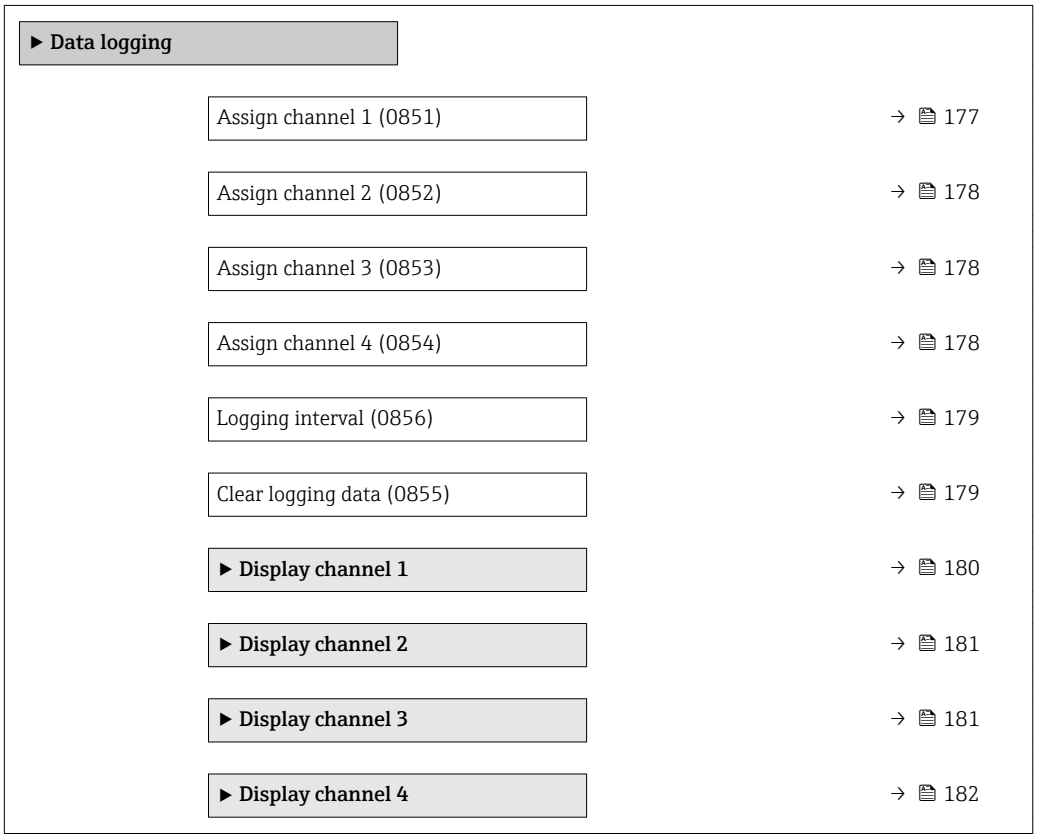
Navigation Expert → Diagnostics → Display module → Software rev. (0072)

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

User interface Positive integer

3.7.7 "Data logging" submenu

Navigation Expert → Diagnostics → Data logging



Assign channel 1

Navigation

Expert → Diagnostics → Data logging → Assign chan. 1 (0851)

Expert → Diagnostics → Data logging → Assign chan. 1 (0851)

Prerequsite

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

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

Description

Use this function to select a process variable for the data logging channel.

Selection

- Off
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Methane fraction *
- Calorific value *
- Wobbe index *
- Temperature *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *
- 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.

* Visibility depends on order options or device settings

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 (→ 43).

Description Options for the assignment of a process variable to the data logging channel.

Selection Picklist, see **Assign channel 1** parameter (→ 177)

Factory setting Off

Assign channel 3

Navigation Expert → Diagnostics → Data logging → Assign chan. 3 (0853)

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

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

Description Options for the assignment of a process variable to the data logging channel.

Selection Picklist, see **Assign channel 1** parameter (→ 177)

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 (→ 43).

Description Options for the assignment of a process variable to the data logging channel.

Selection Picklist, see **Assign channel 1** parameter (→ 177)

Factory setting Off

Logging interval

Navigation

Expert → Diagnostics → Data logging → Logging interval (0856)

Expert → Diagnostics → Data logging → Logging interval (0856)

Prerequsite

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

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

Description

Use this function to enter the logging interval t_{log} for data logging.

User entry

1.0 to 3 600.0 s

Factory setting

10.0 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 Tlog 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:
- $T_{log} = 1000 \times 1$ s = 1 000 s ≈15 min
- $T_{log} = 1000 \times 10$ s = 10 000 s ≈ 3 h
- $T_{log} = 1000 \times 80$ s = 80 000 s ≈ 1 d
- $T_{log} = 1000 \times 3\,600$ s = 3 600 000 s ≈ 41 d

Clear logging data

Navigation

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

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

Prerequsite

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

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

Description

Option to clear the entire logging data.

Selection

- Cancel
- Clear data

Factory setting

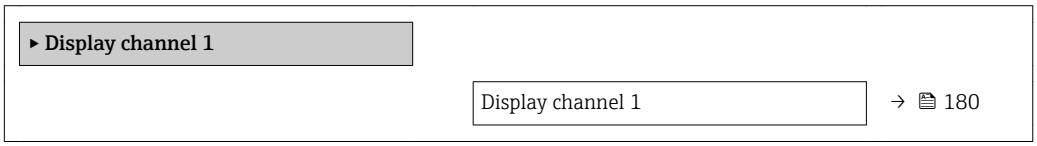
Cancel

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.

"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.

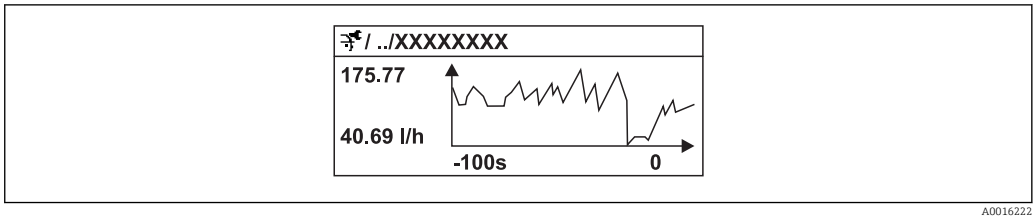
The software options currently enabled are displayed in the **Software option overview** parameter (→ 43).

One of the following options is selected in the **Assign channel 1** parameter (→ 177):
- Volume flow
- Corrected volume flow
- Corrected methane volume flow *
- Mass flow
- Energy flow *
- Methane fraction *
- Calorific value *
- Wobbe index *
- Temperature *
- Sound velocity
- Flow velocity
- Acceptance rate *
- Signal asymmetry *
- Turbulence *
- Signal strength *
- Signal to noise ratio *
- Current output 1

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

* Visibility depends on order options or device settings

Additional information *Description*

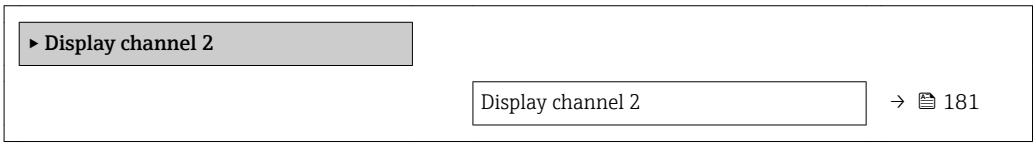


A0016222

- x-axis: depending on the number of channels selected displays 250 to 1000 measured values of a process variable.
- y-axis: displays the approximate measured value span and constantly adapts this to the ongoing measurement.

"Display channel 2" submenu

Navigation Expert → Diagnostics → Data logging → Displ.channel 2



Display channel 2

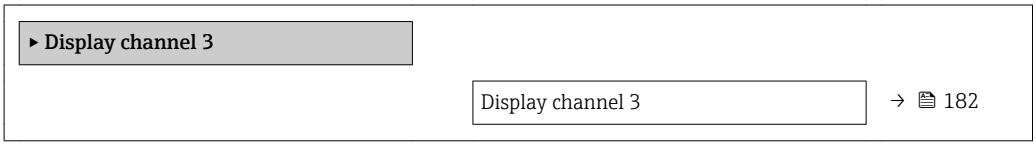
Navigation Expert → Diagnostics → Data logging → Displ.channel 2

Prerequsite A process variable is defined in the **Assign channel 2** parameter.

Description See the **Display channel 1** parameter → 180

"Display channel 3" submenu

Navigation Expert → Diagnostics → Data logging → Displ.channel 3



Display channel 3

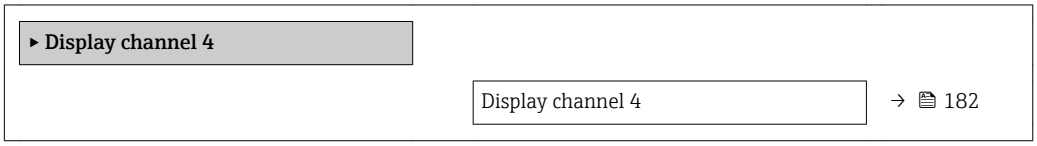
Navigation Expert → Diagnostics → Data logging → Displ.channel 3

Prerequsite A process variable is defined in the **Assign channel 3** parameter.

Description See the **Display channel 1** parameter → 180

"Display channel 4" submenu

Navigation Expert → Diagnostics → Data logging → Displ.channel 4



Display channel 4

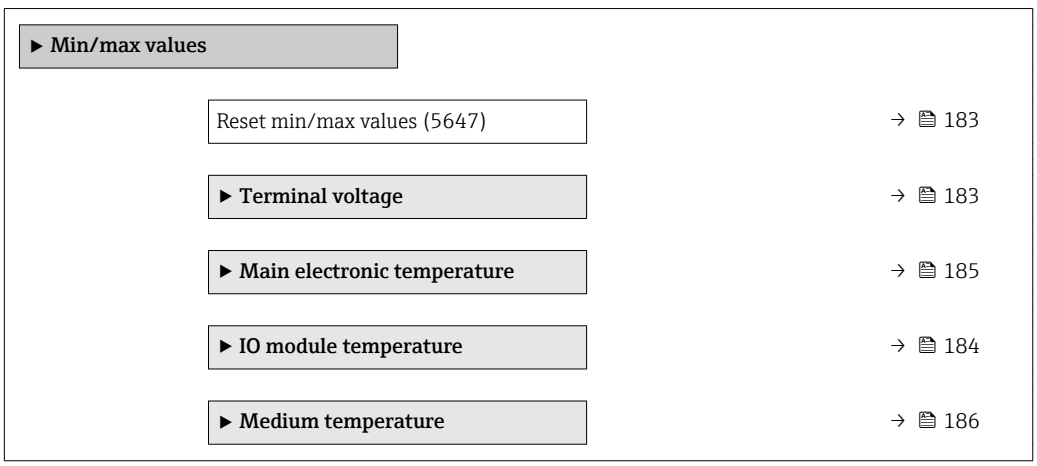
Navigation Expert → Diagnostics → Data logging → Displ.channel 4

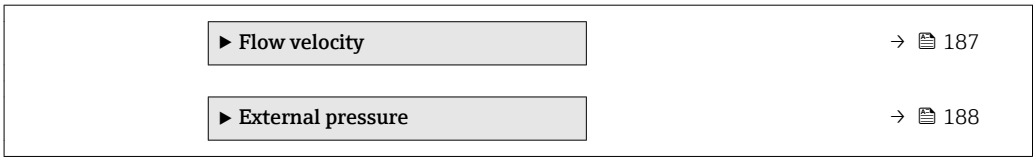
Prerequsite A process variable is defined in the **Assign channel 4** parameter.

Description See the **Display channel 1** parameter → 180

3.7.8 "Min/max values" submenu

Navigation Expert → Diagnostics → Min/max val.





Reset min/max values

Navigation Expert → Diagnostics → Min/max val. → Reset min/max (5647)

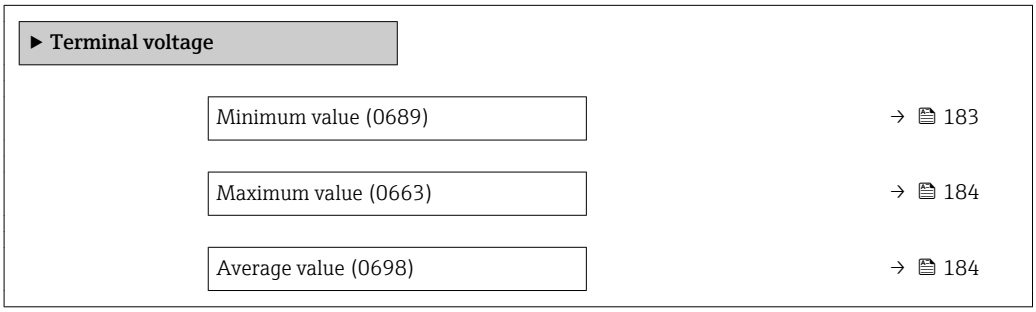
Description Use this function to select measured variables whose minimum, maximum and average measured values are to be reset.

Selection
- Cancel
- Terminal voltage 1
- IO module temperature

Factory setting Cancel

"Terminal voltage" submenu

Navigation Expert → Diagnostics → Min/max val. → Terminal volt.



Minimum value

Navigation Expert → Diagnostics → Min/max val. → Terminal volt. → Minimum value (0689)

Description Use this function to display the smallest previously measured terminal voltage value in Volts.

User interface 0.0 to 50.0 V

Maximum value

Navigation Expert → Diagnostics → Min/max val. → Terminal volt. → Maximum value (0663)

Description Use this function to view the largest previously measured terminal voltage value in Volts.

User interface 0.0 to 50.0 V

Average value

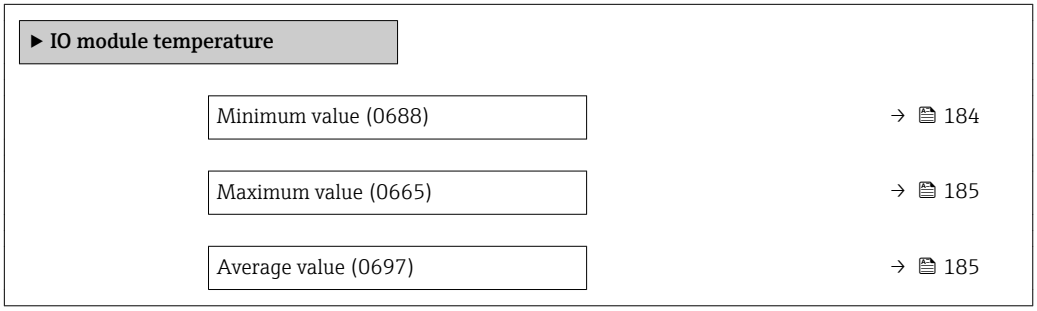
Navigation Expert → Diagnostics → Min/max val. → Terminal volt. → Average value (0698)

Description Use this function to view the average of all previously measured terminal voltage values in Volts.

User interface Signed floating-point number

"IO module temperature" submenu

Navigation Expert → Diagnostics → Min/max val. → IO module temp.



Minimum value

Navigation Expert → Diagnostics → Min/max val. → IO module temp. → Minimum value (0688)

Description Use this function to view the lowest previously measured temperature value of the I/O electronics module.

User interface Signed floating-point number

Additional information *Dependency*

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

Maximum value

Navigation Expert → Diagnostics → Min/max val. → IO module temp. → Maximum value (0665)

Description Use this function to view the highest previously measured temperature value of the I/O electronics module.

User interface Signed floating-point number

Additional information *Dependency*

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

Average value

Navigation Expert → Diagnostics → Min/max val. → IO module temp. → Average value (0697)

Description Use this function to view the average value of all previously measured temperature values of the I/O electronics module.

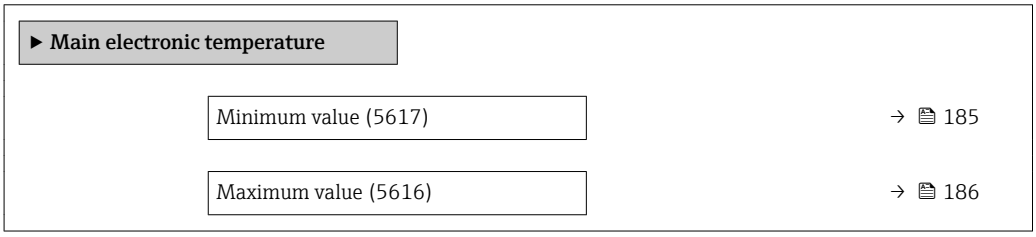
User interface −1 273.15 to 726.85 °C

Additional information *Dependency*

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

"Main electronic temperature" submenu

Navigation Expert → Diagnostics → Min/max val. → Main elect.temp.



Minimum value

Navigation Expert → Diagnostics → Min/max val. → Main elect.temp. → Minimum value (5617)

Description Displays the lowest previously measured temperature value of the main electronics module.

User interface Signed floating-point number

Additional information *Dependency*

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

Maximum value

Navigation Expert → Diagnostics → Min/max val. → Main elect.temp. → Maximum value (5616)

Description Displays the highest previously measured temperature value of the main electronics module.

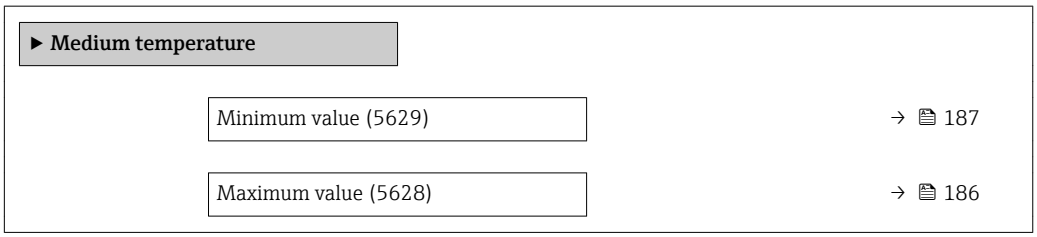
User interface Signed floating-point number

Additional information *Dependency*

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

"Medium temperature" submenu

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



Maximum value

Navigation Expert → Diagnostics → Min/max val. → Medium temp. → Maximum value (5628)

Description Displays the highest previously measured medium temperature value.

User interface Signed floating-point number

Additional information *Dependency*

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

Minimum value

Navigation Expert → Diagnostics → Min/max val. → Medium temp. → Minimum value (5629)

Description Displays the lowest previously measured medium temperature value.

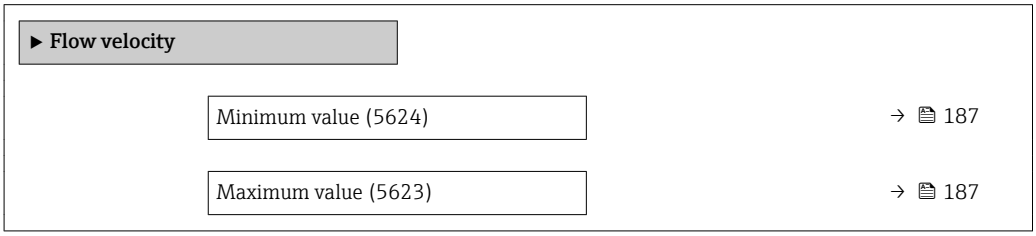
User interface Signed floating-point number

Additional information *Dependency*

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

"Flow velocity" submenu

Navigation Expert → Diagnostics → Min/max val. → Flow velocity



Maximum value

Navigation Expert → Diagnostics → Min/max val. → Flow velocity → Maximum value (5623)

Description Displays the highest previously measured flow velocity.

User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Velocity unit** parameter (→ 66)

Minimum value

Navigation Expert → Diagnostics → Min/max val. → Flow velocity → Minimum value (5624)

Description Displays the lowest previously measured flow velocity.

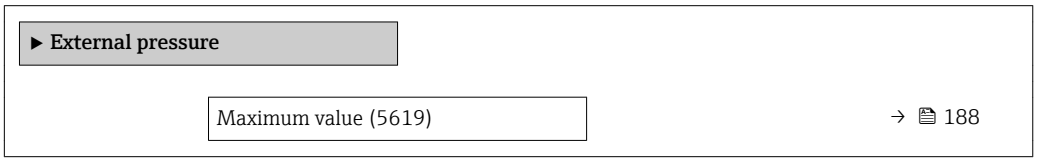
User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Velocity unit** parameter (→ 66)

"External pressure" submenu

Navigation Expert → Diagnostics → Min/max val. → External press.



Maximum value

Navigation Expert → Diagnostics → Min/max val. → External press. → Maximum value (5619)

Description Displays the highest previously measured external pressure.

User interface Signed floating-point number

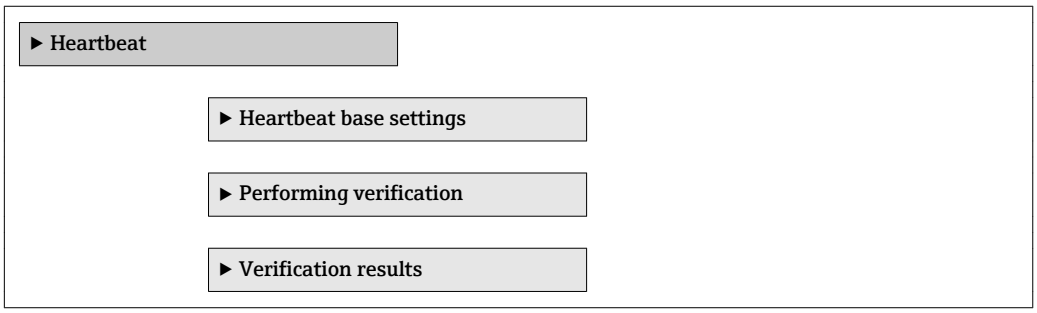
Additional information *Dependency*

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

3.7.9 "Heartbeat" submenu

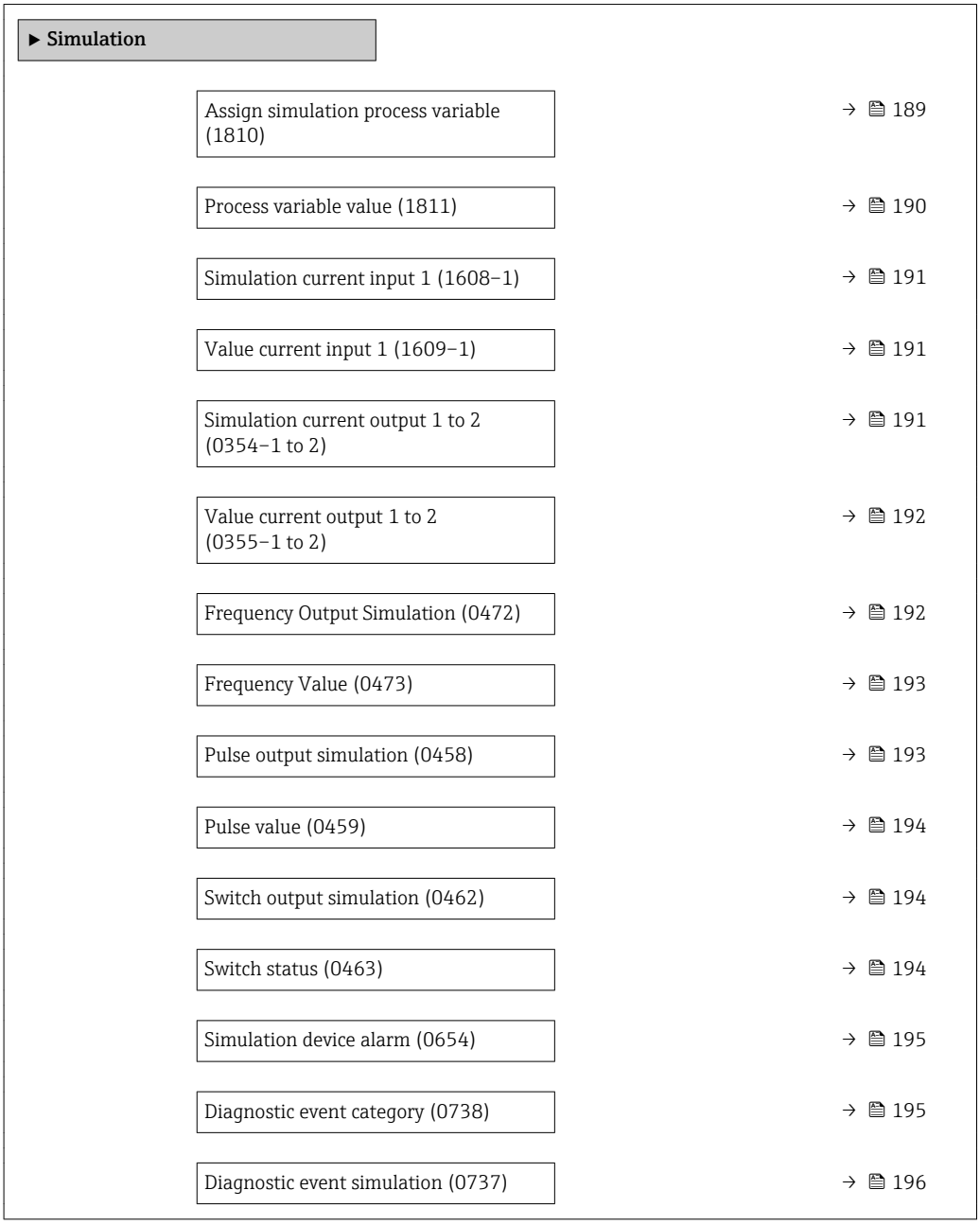
For detailed information on the parameter descriptions of the **Heartbeat Verification** application package, see the Special Documentation for the device

Navigation Expert → Diagnostics → Heartbeat



3.7.10 "Simulation" submenu

Navigation Expert → Diagnostics → Simulation



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
- Methane fraction
- Corrected methane volume flow
- Mass flow
- Temperature
- Energy flow
- Wobbe index
- Calorific value
- Flow velocity
- Sound velocity

Factory setting
Off

Additional information
Description

The simulation value of the selected process variable is specified in the **Process variable value** parameter (→ 190).

Process variable value

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

Prerequisite
One of the following options is selected in the **Assign simulation process variable** parameter (→ 189):
- Volume flow
- Corrected volume flow
- Methane fraction *
- Corrected methane volume flow *
- Mass flow
- Temperature *
- Energy flow *
- Wobbe index *
- Calorific value *
- Flow velocity
- Sound velocity

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 (→ 58).

* Visibility depends on order options or device settings

Simulation current input 1

Navigation Expert → Diagnostics → Simulation → Sim.curr.inp 1 (1608–1)

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 specified in the **Value current input** parameter (→ 191).

Selection
- Off
- On

Factory setting Off

Additional information *Options*
- 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

Navigation Expert → Diagnostics → Simulation → Value curr.inp 1 (1609–1)

Prerequsite In the **Simulation current input** parameter (→ 191) 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 3.59 to 22.5 mA

Simulation current output 1 to 2

Navigation Expert → Diagnostics → Simulation → Sim.curr.out. 1 to 2 (0354–1 to 2)

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 specified in the **Value current output 1 to 2** parameter.

Options

- Off
  Current simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
  Current simulation is active.

Value current output 1 to 2

Navigation Expert → Diagnostics → Simulation → Value curr.out 1 to 2 (0355–1 to 2)

Prerequisite In the **Simulation current output 1 to 2** parameter the **On** option is selected.

Description Use this function to enter a current value for the simulation. In this way, users can verify the correct adjustment of the current output and the correct function of downstream switching units.

User entry 3.59 to 22.5 mA

Factory setting 3.59 mA

Frequency Output Simulation

Navigation Expert → Diagnostics → Simulation → FreqOutputSim (0472)

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (→ 112).

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** parameter (→ 193).

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.

Frequency Value

Navigation Expert → Diagnostics → Simulation → Freq Value (0473)

Prerequisite The **On** option is selected in the **Frequency Output Simulation** parameter (→ 192).

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 1250.0 Hz

Factory setting 0.0 Hz

Pulse output simulation

Navigation Expert → Diagnostics → Simulation → Puls.outp.sim. (0458)

Prerequisite The **Pulse** option is selected in the **Operating mode** parameter (→ 112).

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** parameter (→ 194).

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 (→ 114).
- Down-counting value
  The pulses specified in the **Pulse value** parameter (→ 194) are output.

Pulse value

Navigation Expert → Diagnostics → Simulation → Pulse value (0459)

Prerequisite The **Down-counting value** option is selected in the **Pulse output simulation** parameter (→ 193).

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

Factory setting 0

Switch output simulation

Navigation Expert → Diagnostics → Simulation → Switch sim. (0462)

Prerequisite The **Switch** option is selected in the **Operating mode** parameter (→ 112).

Description Use this function to switch simulation of the switch output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection
- Off
- On

Factory setting Off

Additional information

Description

The desired simulation value is defined in the **Switch status** parameter (→ 194).

Selection
- Off
  Switch simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
  Switch simulation is active.

Switch status

Navigation Expert → Diagnostics → Simulation → Switch status (0463)

Prerequisite The **On** option is selected in the **Switch output simulation** parameter (→ 194).

Description Use this function to select a switch value for the simulation. In this way, users can verify the correct adjustment of the switch output and the correct function of downstream switching units.

Selection
- Open
- Closed

Factory setting Open

Additional information *Options*
- 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.

Simulation device alarm

Navigation Expert → Diagnostics → Simulation → Sim. alarm (0654)

Description Use this function to switch the device alarm on and off. In this way, users can verify the correct adjustment of the current output and the correct function of downstream switching units. 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

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 (→ 196).

Selection
- Sensor
- Electronics
- Configuration
- Process

Factory setting Process

Diagnostic event simulation

Navigation Expert → Diagnostics → Simulation → Diag. event sim. (0737)

Description Use this function to select a diagnostic event for the simulation process that is activated.

Selection
- Off
- Diagnostic event picklist (depends on the category selected)

Factory setting Off

Additional information *Description*

For the simulation, you can choose from the diagnostic events of the category selected in the **Diagnostic event category** parameter (→ 195).

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
Energy	kWh
Energy flow	kW
Calorific value	kWh/Nm^3
Velocity	m/s
Temperature	°C
Pressure	mbar a

4.1.2 Full scale values

The factory settings applie to the following parameters:
- 20 mA value (full scale value of the current output)
- 100% bar graph value 1
- 100% bar graph value 3

Nominal diameter [mm]	Full scale value [m^3/h]
50	130
80	310
100	520
150	1 140
200	1 940

4.1.3 Output current span

Current output 1	4 to 20 mA NAMUR
Current output 2	4 to 20 mA NAMUR

4.1.4 On value low flow cut off

The switch-on point depends on the type of medium and the nominal diameter.

Nominal diameter [mm]	On value [m³/h]
50	0.9
80	2.0
100	3.4
150	7.6
200	12.9

4.2 US units

Only valid for USA and Canada.

4.2.1 System units

Mass	lb
Mass flow	lb/min
Volume	ft³
Volume flow	ft³/min
Corrected volume	Sft³
Corrected volume flow	Sft³/h
Energy	Btu
Energy flow	Btu/h
Calorific value	Btu/Sft³
Velocity	ft/s
Temperature	°F
Pressure	psi a

4.2.2 Full scale values

The factory settings applie to the following parameters:
- 20 mA value (full scale value of the current output)
- 100% bar graph value 1
- 100% bar graph value 3

Nominal diameter [in]	Full scale value [ft³ /min]
2	80
3	180
4	300
6	670
8	1 140

4.2.3 Output current span

Current output 1	4 to 20 mA US
Current output 2	4 to 20 mA US

4.2.4 On value low flow cut off

The switch-on point depends on the type of medium and the nominal diameter.

Nominal diameter [in]	On value [ft³/min]
2	0.5
3	1.2
4	2.0
6	4.5
8	7.6

5 Explanation of abbreviated units

5.1 SI units

Process variable	Units	Explanation
Calorific value	kWh/Nm³, kJ/Nm³	Kilowatt hour, kilojoule/standard cubic meter
	kWh/Sm³, kJ/Sm³	Kilowatt hour, kilojoule/standard cubic meter
Pressure	Pa, kPa, MPa	Pascal, kilopascal, megapascal
	mbar, bar	Millibar, bar
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
Velocity	m/s	Meter/time unit
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
Corrected volume	Nl, Nm³, Sm³	Normal liter, normal cubic meter, standard cubic meter
Corrected volume flow	Nl/s, Nl/min, Nl/h, Nl/d	Normal liter/time unit
	Nm³/s, Nm³/min, Nm³/h, Nm³/d	Normal cubic meter/time unit
	Sm³/s, Sm³/min, Sm³/h, Sm³/d	Standard cubic meter/time unit
Temperature	°C , K	Celsius, Kelvin
Volume	cm³, dm³, m³	Cubic centimeter, cubic decimeter, cubic meter
	ml, l	Milliliter, liter
Volume	dm³, m³	Cubic decimeter, meter
	l	Liter
Volume flow	dm³/s, dm³/min, dm³/h, dm³/d	Cubic decimeter/time unit
	m³/s, m³/min, m³/h, m³/d	Cubic meter/time unit
	l/s, l/min, l/h, l/d	Liter/time unit
Time	m, h, d, y	Minute, hour, day, year

5.2 US units

Process variable	**Units**	**Explanation**
Pressure	psi a	Psi absolute
Velocity	ft/s	Foot/time unit
Mass	oz, lb, STon	Ounce, pound, standard ton

Process variable	Units	Explanation
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
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
Temperature	°F, °R	Fahrenheit, Rankine
Volume	ft^3	Cubic foot
Volume flow	ft^3/s, ft^3/min, ft^3/h, ft^3/d	Cubic foot/time unit
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
Calorific value	Btu/Sm^3, $MBtu/Sm^3$	British thermal unit, thousand British thermal units/ standard cubic meter
	Btu/Sft^3, $MBtu/Sft^3$	British thermal unit, thousand British thermal units/ standard cubic foot
Density	lb/gal (imp), lb/bbl (imp;beer), lb/bbl (imp;oil)	Pound/volume unit
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
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
Time	m, h, d, y	Minute, hour, day, year
	am, pm	Ante meridiem (before midday), post meridiem (after midday)

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