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71399888
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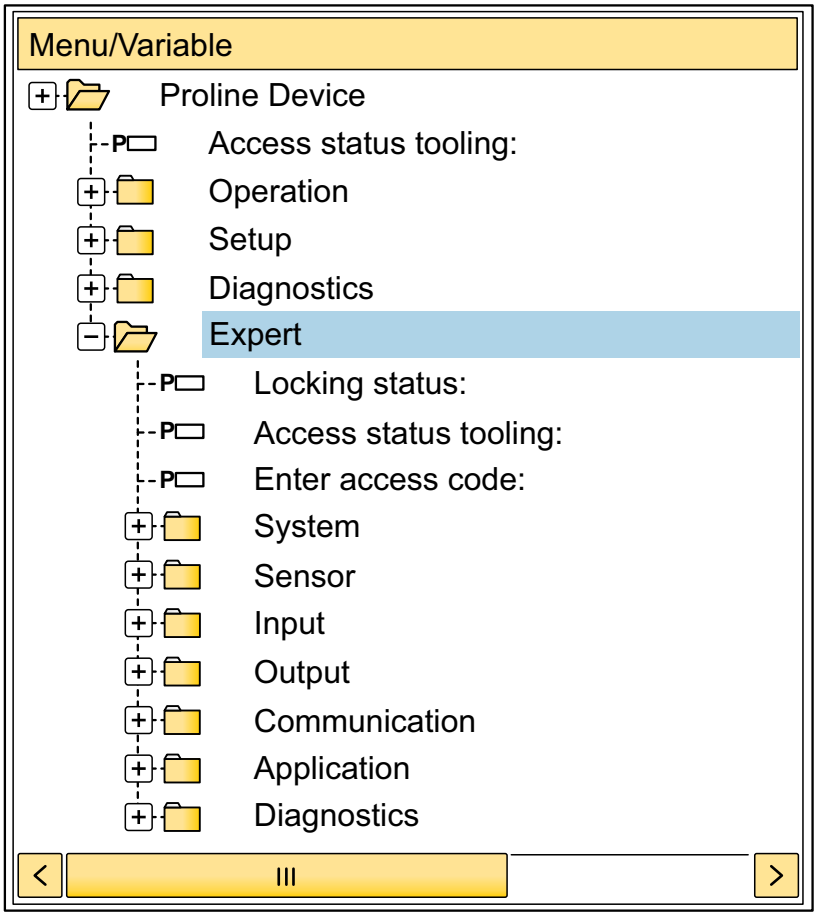
Valid as of version
01.01.zz (Device firmware)

Description of Device Parameters
Proline Promass 200
PROFIBUS PA

Coriolis 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.

It is used to perform tasks that require detailed knowledge of the function of the device:
- Commissioning measurements under difficult conditions
- Optimal adaptation of the measurement to difficult conditions
- Detailed configuration of the communication interface
- Error diagnostics in difficult cases

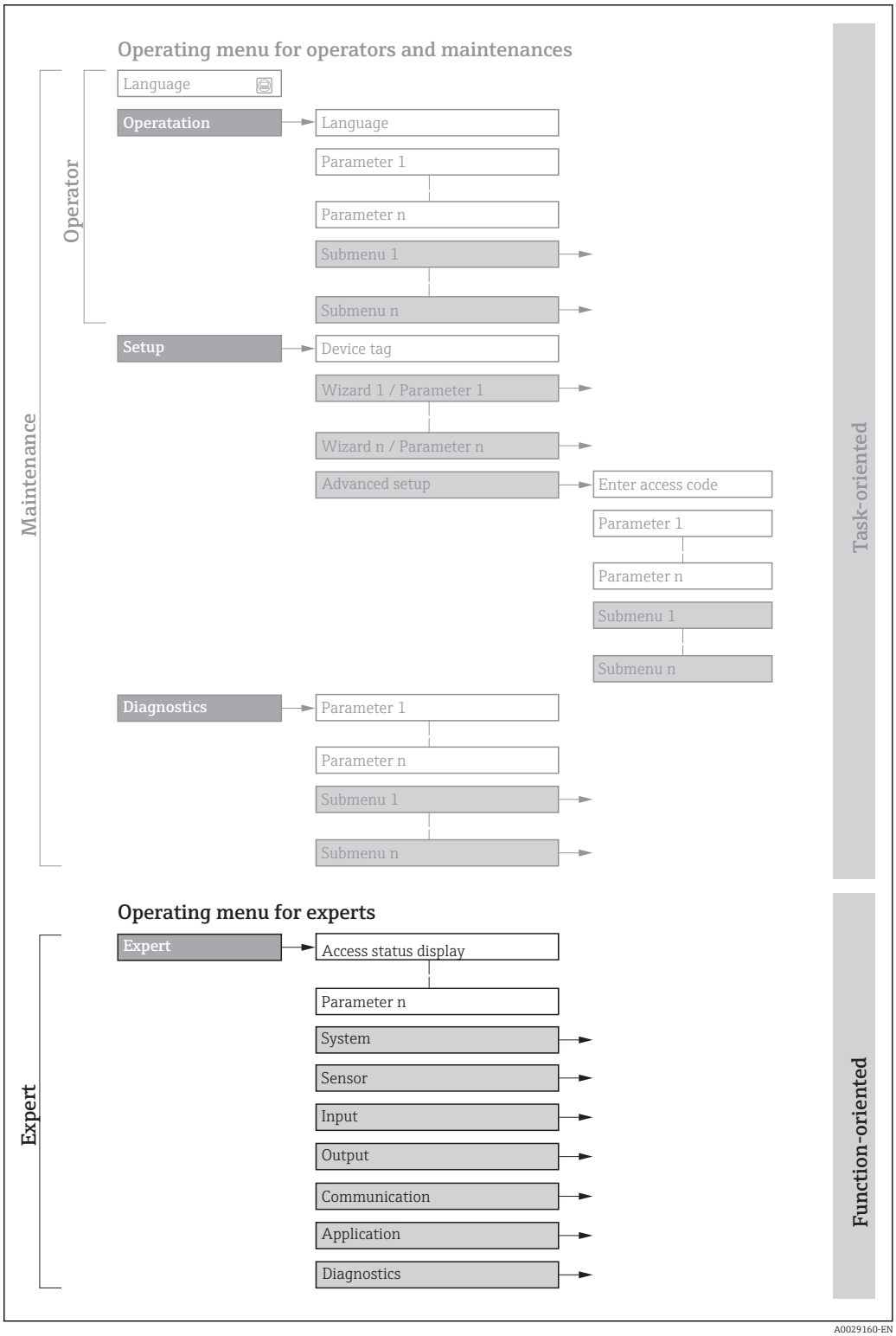
1.2 Target group

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

1.3 Using this document

1.3.1 Information on the document structure

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



1 *Sample graphic for the schematic layout of the operating menu*

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

1.3.2 Structure of a parameter description

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

Complete parameter name	Write-protected parameter

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

Prerequisite
The parameter is only available under these specific conditions

Description
Description of the parameter function

Selection
List of the individual options for the parameter
- Option 1
- Option 2

User entry
Input range for the parameter

User interface
Display value/data for the parameter

Factory setting
Default setting ex works

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

1.4 Symbols used

1.4.1 Symbols for certain types of information

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

1.4.2 Symbols in graphics

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

1.5 Documentation

1.5.1 Standard documentation

Operating Instructions

Measuring device	Documentation code
Promass 8A2B**-...	BA01828D
Promass 8E2B**–...	BA01133D
Promass 8E2C**–...	BA01637D
Promass 8F2B**–...	BA01113D

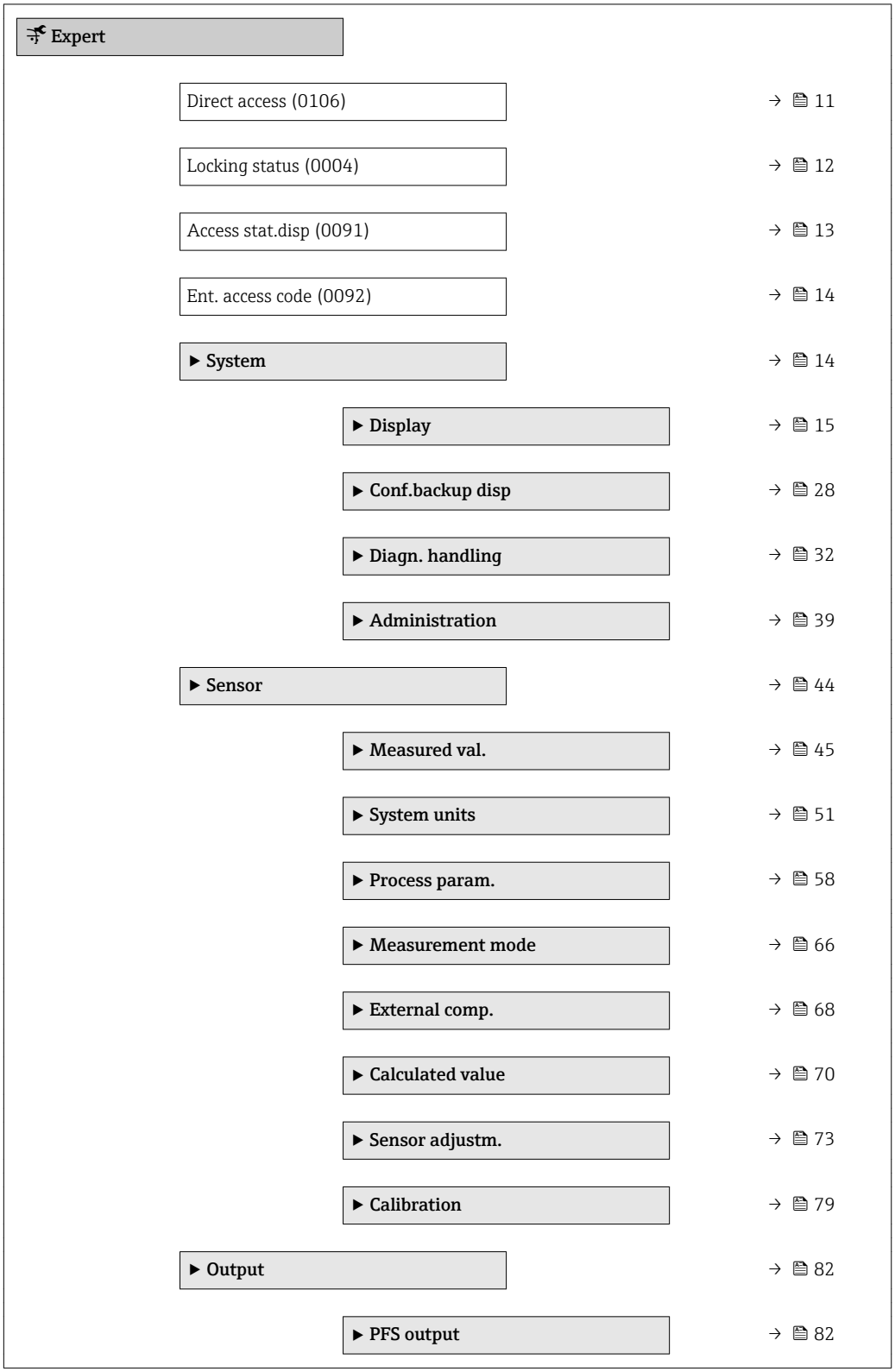
1.5.2 Supplementary device-dependent documentation

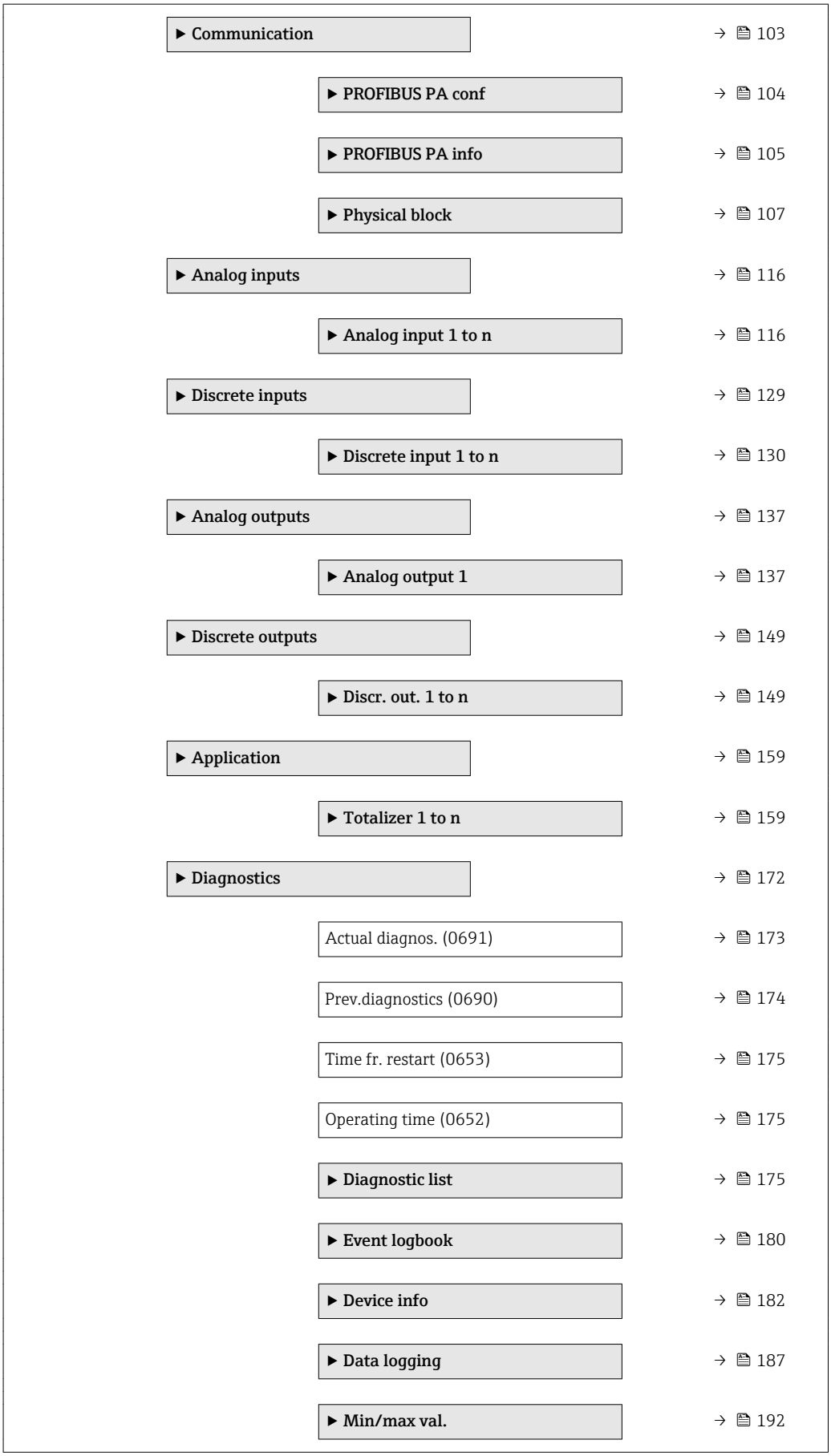
Special Documentation

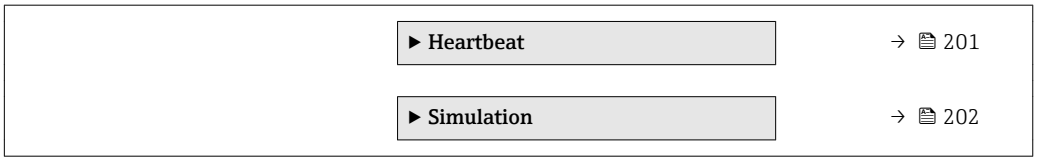
Content	Documentation code
Information on the Pressure Equipment Directive	SD01614D
Display and operating module FHX50	SD01007F
Heartbeat Technology	SD01850D

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.

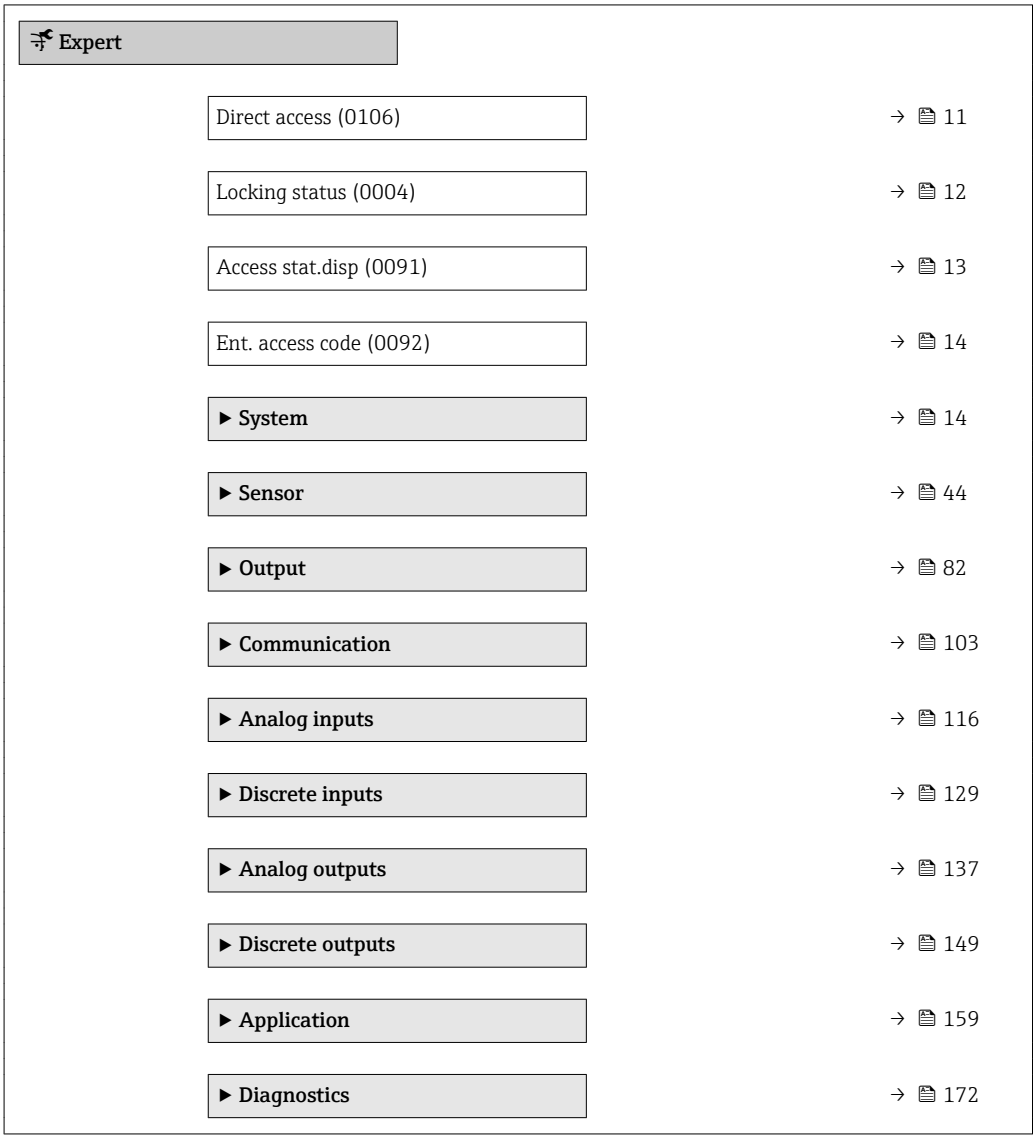



▶ Communication → 103
▶ PROFIBUS PA conf → 104
▶ PROFIBUS PA info → 105
▶ Physical block → 107
▶ Analog inputs → 116
▶ Analog input 1 to n → 116
▶ Discrete inputs → 129
▶ Discrete input 1 to n → 130
▶ Analog outputs → 137
▶ Analog output 1 → 137
▶ Discrete outputs → 149
▶ Discr. out. 1 to n → 149
▶ Application → 159
▶ Totalizer 1 to n → 159
▶ Diagnostics → 172
Actual diagnos. (0691) → 173
Prev.diagnostics (0690) → 174
Time fr. restart (0653) → 175
Operating time (0652) → 175
▶ Diagnostic list → 175
▶ Event logbook → 180
▶ Device info → 182
▶ Data logging → 187
▶ Min/max val. → 192


▶ Heartbeat
→ 201
▶ Simulation
→ 202

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)

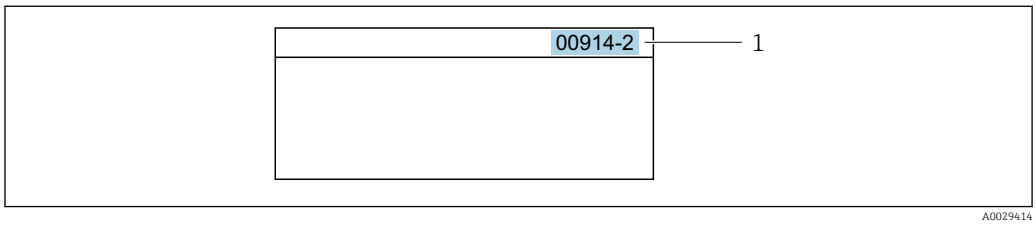
Description Use this function to enter the access code to enable direct access to the desired parameter via the local display. A parameter number is assigned to each parameter for this purpose.

User entry 0 to 65 535

Additional information

User entry

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



1 Direct access code

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

Locking status

Navigation

Expert → Locking status (0004)

Description

Displays the active write protection.

User interface

- Hardware locked
- Temp. locked

Additional information

Display

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

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

Selection

Options	Description
None	The access status displayed in the **Access stat.disp** parameter (→ 13) applies . Only appears on local display.
Hardware locked (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) .
Temp. locked (priority 2) (priority 2)	Write access to the parameters is temporarily locked on account of internal processes running in the device (e.g. data upload/download, reset etc.). Once the internal processing has been completed, the parameters can be changed once again.

Access stat.disp

Navigation Expert → Access stat.disp (0091)

Prerequisite A local display is provided.

Description Displays 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 **Ent. access code** parameter (→ 14).

For information about the **Ent. access code** parameter (→ 14): see the "Disabling write protection via the access code" section of the Operating Instructions for the device → 7

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

Display

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

Access stat.tool

Navigation Expert → Access stat.tool (0005)

Description Displays 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 **Ent. access code** parameter (→ 14).

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

Display

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

Ent. 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

Ent. access code

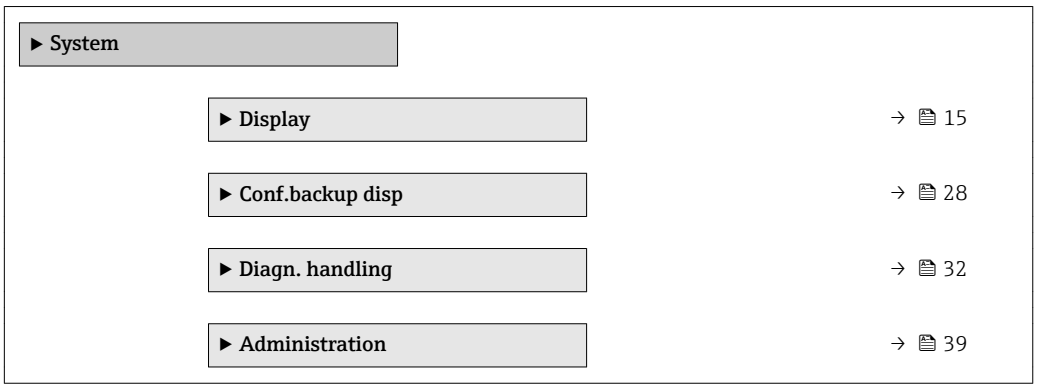
Navigation Expert → Ent. access code (0003)

Description Use this function to enter the user-specific release code to remove parameter write protection 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)

Prerequisite A local display is provided.

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

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

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

Format display

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

Prerequisite A local display is provided.

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

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

Factory setting 1 value, max.

* Visibility depends on order options or device settings

Additional information

Description

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

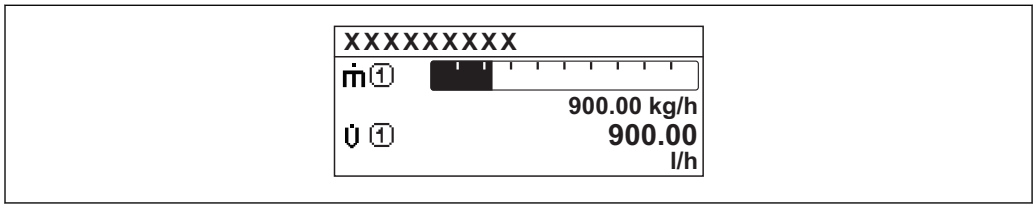
- The **Value 1 display** parameter (→ 19) to **Value 4 display** parameter (→ 23) are used to specify which measured values are shown on the local display and in what order.
- If more measured values are specified than the display mode selected permits, then the values alternate on the device display. The display time until the next change is configured via the **Display interval** parameter (→ 24).

Possible measured values shown on the local display:

"1 value, max." option

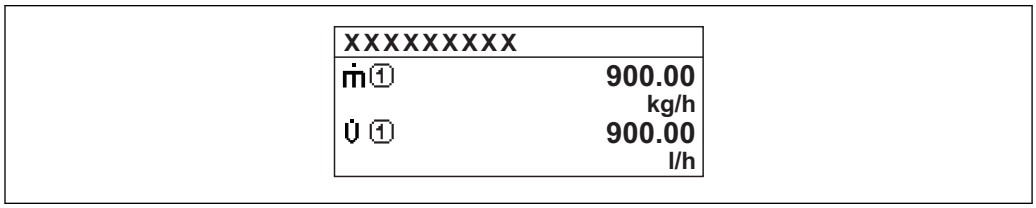
A0013099

"Bargr. + 1 value" option



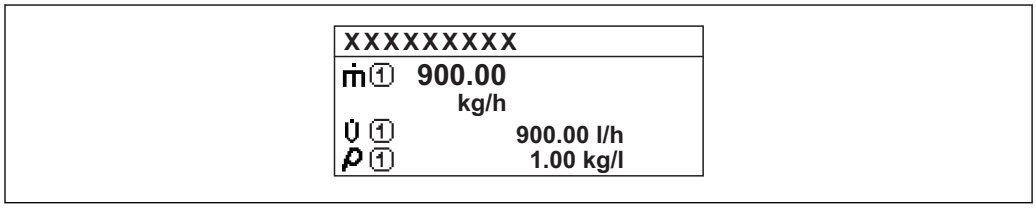
A0013098

"2 values" option



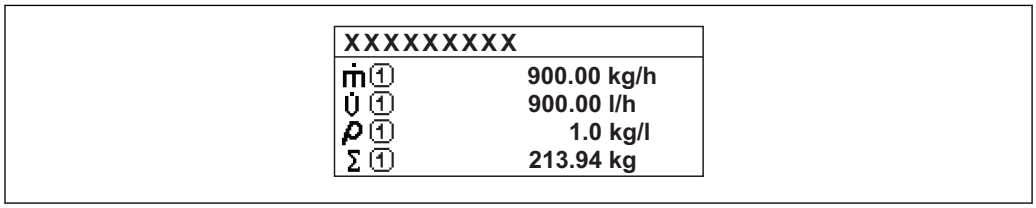
A0013100

"Val. large+2val." option



A0013102

"4 values" option



A0013103

Value 1 display

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

Prerequisite A local display is provided.

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

Selection
- Mass flow
- Volume flow
- Correct.vol.flow
- Density
- Ref.density
- Temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3

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.

Dependency

The unit of the displayed measured value is taken from the **System units** submenu (→ 51).

0% bargraph 1

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

Prerequisite A local display is provided.

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

User entry Signed floating-point number

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

Additional information

Description

The **Format display** parameter (→ 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 (→ 51).

100% bargraph 1

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

Prerequisite A local display is provided.

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

User entry Signed floating-point number

Factory setting Depends on country and nominal diameter → 208

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 (→ 51).

Decimal places 1

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

Prerequisite A measured value is specified in the **Value 1 display** parameter (→ 19).

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

Selection

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

Factory setting x.xx

Additional information *Description*

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

Value 2 display

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

Prerequisite A local display is provided.

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

Selection For the picklist, see the **Value 1 display** parameter (→ 19)

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.

Dependency

The unit of the displayed measured value is taken from the **System units** submenu (→ 51).

Decimal places 2

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

Prerequisite A measured value is specified in the **Value 2 display** parameter (→ 21).

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

Selection

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

Factory setting x.xx

Additional information *Description*

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

Value 3 display

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

Prerequisite A local display is provided.

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

Selection For the picklist, see the **Value 1 display** parameter (→ 19)

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 (→ 51).

0% bargraph 3

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

Prerequisite A selection was made in the **Value 3 display** parameter (→ 22).

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

User entry Signed floating-point number

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

Additional information

Description

The **Format display** parameter (→ 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 (→ 51).

100% bargraph 3

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

Prerequisite A selection was made in the **Value 3 display** parameter (→ 22).

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

User entry Signed floating-point number

Factory setting 0

Additional information *Description*

The **Format display** parameter (→ 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 (→ 51).

Decimal places 3

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

Prerequisite A measured value is specified in the **Value 3 display** parameter (→ 22).

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

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

Factory setting x.xx

Additional information *Description*

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

Value 4 display

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

Prerequisite A local display is provided.

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

Selection For the picklist, see the **Value 1 display** parameter (→ 19)

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 (→ 51).

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 (→ 19) to **Value 4 display** parameter (→ 23) are used to specify which measured values are shown on the local display.
- The display format of the displayed measured values is specified using the **Format display** parameter (→ 16).

Display damping

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

Prerequisite A local display is provided.

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

User entry 0.0 to 999.9 s

Factory setting 0.0 s

Additional information *User entry*

Use this function to enter a time constant (PT1 element [1]) for display damping:
- If a low time constant is entered, the display reacts particularly quickly to fluctuating measured variables.
- On the other hand, the display reacts more slowly if a high time constant is entered.

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

Header

Navigation Expert → System → Display → Header (0097)

Prerequisite A local display is provided.

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

Selection
- Device tag
- Free text

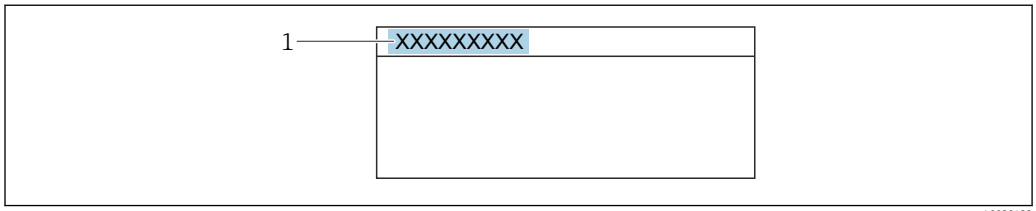
Factory setting Device tag

1) proportional transmission behavior with first order delay

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 (→ 183).
- Free text
  Is defined in the **Header text** parameter (→ 26).

Header text

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

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

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

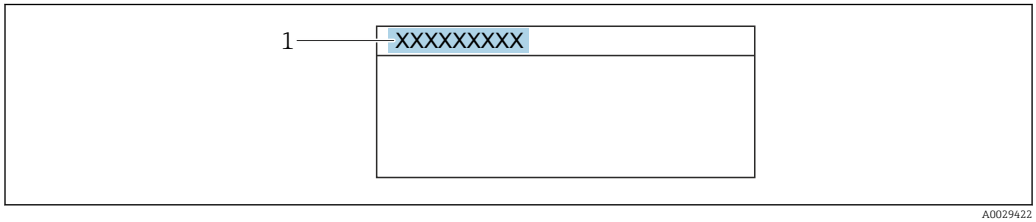
User entry Max. 12 characters such as letters, numbers or special characters (e.g. @, %, /)

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

Additional information

Description

The header text only appears during normal operation.



1 Position of the header text on the display

User entry

The number of characters displayed depends on the characters used.

Separator

Navigation Expert → System → Display → Separator (0101)

Prerequisite A local display is provided.

Description Use this function to select the decimal separator.

Selection
- . (point)
- , (comma)

Factory setting . (point)

Contrast display

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

Prerequisite A local display is provided.

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

User entry 20 to 80 %

Factory setting Depends on the display

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)

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

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

Selection
- Disable
- Enable

Factory setting Disable

Access stat.disp

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

Prerequisite A local display is provided.

Description Displays 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 **Ent. access code** parameter (→ 14).

For information about the **Ent. access code** parameter (→ 14): see the "Disabling write protection via the access code" section of the Operating Instructions for the device → 7

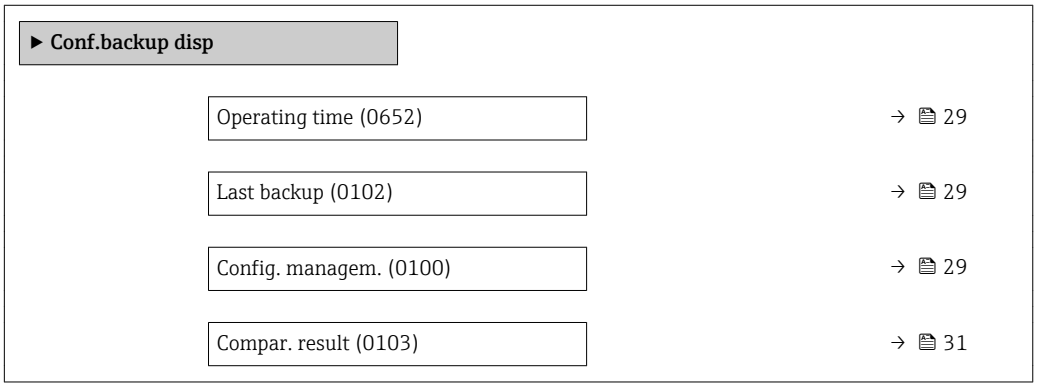
If additional write protection is active, this restricts the current access authorization even further.

Display

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

3.1.2 "Conf.backup disp" 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)

Config. managem.

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

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: **Backup state** parameter (→ 30)

Selection

Options	Description
Cancel	No action is executed and the user exits the parameter.
Execute backup	A backup copy of the current device configuration is saved from the HistoROM backup to the 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 restored from the display module to the device's HistoROM backup. The backup copy includes the transmitter data of the device. The following message appears on local display: Restore active! Do not interrupt power supply!
Compare	The device configuration saved in the display module is compared with the current device configuration of the HistoROM backup. The following message appears on local display: Comparing files The result can be viewed in **Compar. result** parameter (→ 31).
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!
Clear backup	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)

Prerequisite A local display is provided.

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

User interface

- None
- Store in progr.
- Restore in progr
- Import in progr.
- Delete in progr.
- Comp. in progr.

Factory setting None

Compar. result

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

Prerequisite 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
- Set. identical
- Set. not ident.
- No backup
- Backup corrupt
- Check not done
- Dataset incomp.

Factory setting Check not done

Additional information

Description

The comparison is started via the **Compare** option in the **Config. managem.** parameter (→ 29).

Selection

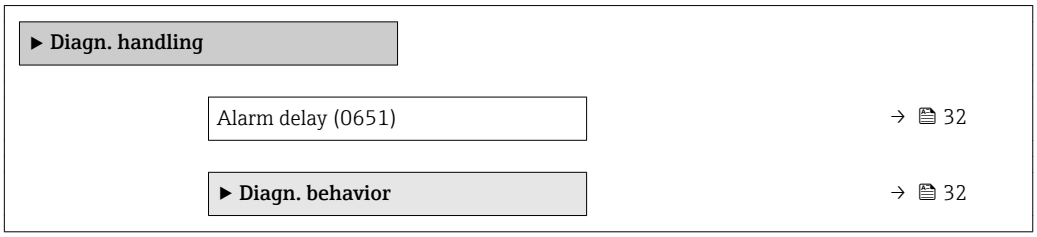
- Set. identical
  - The current device configuration of the HistoROM is identical to the backup copy in the display module.
  - If the transmitter configuration of another device has been copied to the device via the display module and the **Duplicate** option in the **Config. managem.** parameter (→ 29), 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.
- Set. not ident.
  The current device configuration of the HistoROM is not identical to the backup copy in the display module.
- No backup
  There is no backup copy of the device configuration of the HistoROM in the display module.
- Backup 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 incomp.
  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 "Diagn. handling" submenu

Navigation Expert → System → Diagn. handling



Alarm delay

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

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

The diagnostic message is reset without a time delay.

User entry 0 to 60 s

Factory setting 0 s

Additional information *Description*

This setting affects the following diagnostic messages:
- 046 Sensor limit
- 140 Sensor signal
- 830 Sensor temp.
- 831 Sensor temp.
- 832 Electronic temp.
- 833 Electronic temp.
- 834 Process temp.
- 835 Process temp.
- 912 Medium inhomog.
- 913 Medium unsuitab.

"Diagn. behavior" submenu

Each item of diagnostic information is assigned a specific diagnostic behavior at the factory. The user can change this assignment for specific diagnostic information in the **Diagn. behavior** submenu (→ 32).

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

Diagnostic behavior	Description
Alarm	The device stops measurement. The totalizers assume the defined alarm condition. A diagnostic message is generated. For local display with touch control: the background lighting changes to red.
Warning	The device continues to measure. The measured value output via PROFIBUS and the totalizers are not affected. A diagnostic message is generated.
Logbook only	The device continues to measure. The diagnostic message is displayed only in the **Event logbook** submenu (→ 180) (**Event list** submenu (→ 181)) and not in alternation with the operational display.
Off	The diagnostic event is ignored, and no diagnostic message is generated or entered.

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

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

► **Diagn. behavior**

Diagnostic no. 046 (0655)	→ 34
Diagnostic no. 140 (0723)	→ 34
Diagnostic no. 274 (0725)	→ 34
Diagnostic no. 442 (0658)	→ 35
Diagnostic no. 443 (0659)	→ 35
Diagnostic no. 801 (0660)	→ 35
Diagnostic no. 830 (0715)	→ 36
Diagnostic no. 831 (0716)	→ 36
Diagnostic no. 832 (0675)	→ 37
Diagnostic no. 833 (0676)	→ 37
Diagnostic no. 834 (0677)	→ 37
Diagnostic no. 835 (0678)	→ 38
Diagnostic no. 862 (0679)	→ 38
Diagnostic no. 912 (0720)	→ 38
Diagnostic no. 913 (0717)	→ 39

Diagnostic no. 046 (Sensor limit)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 046 (0655)

Description Option for changing the diagnostic behavior of the diagnostic message ⚠**046 Sensor limit**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information Detailed description of the options available for selection: → 32

Diagnostic no. 140 (Sensor signal)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 140 (0723)

Description Option for changing the diagnostic behavior of the diagnostic message **140 Sensor signal**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information Detailed description of the options available for selection: → 32

Diagnostic no. 274 (Main electronic)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 274 (0725)

Description Option for changing the diagnostic behavior of the diagnostic message **274 Main electronic**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information Detailed description of the options available for selection: → 32

Diagnostic no. 442 (Freq. output)

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

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

Description Option for changing the diagnostic behavior of the diagnostic message **442 Freq. output**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information *Selection*

Detailed description of the options available for selection: → 32

Diagnostic no. 443 (Pulse output)

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

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

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

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information *Selection*

Detailed description of the options available for selection: → 32

Diagnostic no. 801 (Supply voltage)

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

Description Option for changing the diagnostic behavior of the diagnostic message **801 Supply voltage**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information *Selection*

Detailed description of the options available for selection: → 32

Diagnostic no. 830 (Sensor temp.)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 830 (0715)

Prerequisite If the carrier tube temperature is available (applies only to Promass F).

Description Option for changing the diagnostic behavior of the diagnostic message **830 Sensor temp.**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information Detailed description of the options available for selection: → 32

Diagnostic no. 831 (Sensor temp.)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 831 (0716)

Prerequisite If the carrier tube temperature is available (applies only to Promass F).

Description Option for changing the diagnostic behavior of the diagnostic message **831 Sensor temp.**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information Detailed description of the options available for selection: → 32

Diagnostic no. 832 (Electronic temp.)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 832 (0675)

Description Option for changing the diagnostic behavior of the diagnostic message **832 Electronic temp.**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information *Selection*

Detailed description of the options available for selection: → 32

Diagnostic no. 833 (Electronic temp.)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 833 (0676)

Description Option for changing the diagnostic behavior of the diagnostic message **833 Electronic temp.**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information *Selection*

Detailed description of the options available for selection: → 32

Diagnostic no. 834 (Process temp.)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 834 (0677)

Description Option for changing the diagnostic behavior of the diagnostic message **834 Process temp.**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information *Selection*

Detailed description of the options available for selection: → 32

Diagnostic no. 835 (Process temp.)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 835 (0678)

Description Option for changing the diagnostic behavior of the diagnostic message **835 Process temp.**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information *Selection*

Detailed description of the options available for selection: → 32

Diagnostic no. 862 (Empty pipe)

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

Description Option for changing the diagnostic behavior of the diagnostic message **862 Empty pipe**.

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information Detailed description of the options available for selection: → 32

Diagnostic no. 912 (Medium inhomog.)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 912 (0720)

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

Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information Detailed description of the options available for selection: → 32

Diagnostic no. 913 (Medium unsuitab.)

Navigation Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 913 (0717)

Description Option for changing the diagnostic behavior of the diagnostic message **913 Medium unsuitab.**.

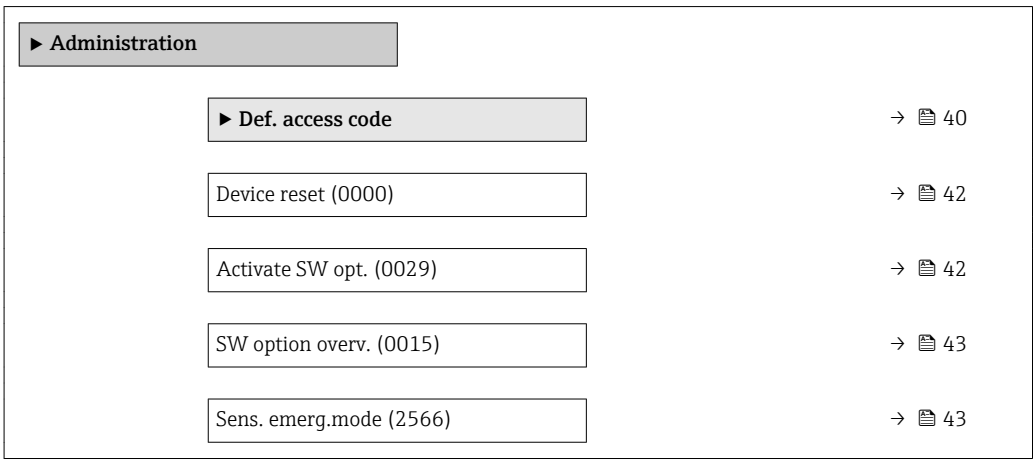
Selection
- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information Detailed description of the options available for selection: → 32

3.1.4 "Administration" submenu

Navigation Expert → System → Administration

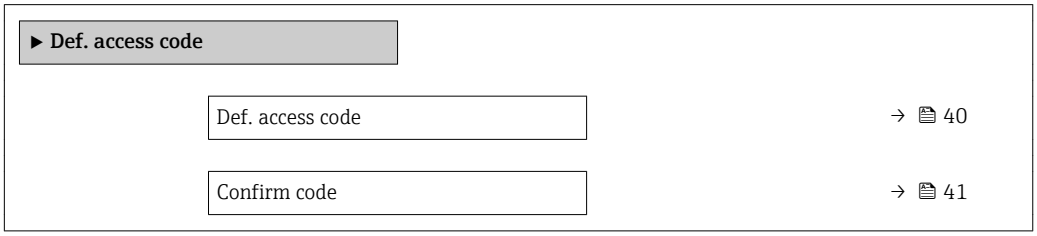


"Def. access code" wizard

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

If operating via the operating tool, the **Def. access code** parameter (→ 41) can be found directly in the **Administration** submenu. There is no **Confirm code** parameter if the device is operated via the operating tool.

Navigation Expert → System → Administration → Def. access code



Def. access code

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

Description Use this function to enter a user-specific release code to restrict write-access to the parameters. This protects the 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 **Ent. access code** parameter (→ 14).

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

User entry

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

Factory setting

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

Confirm 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

Def. access code

Navigation Expert → System → Administration → 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 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 **Ent. access code** parameter (→ 14).

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

User entry

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

Factory setting

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

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 fact.defaults
- To delivery set.
- Restart device

Factory setting Cancel

Additional information *Selection*

Options	Description
Cancel	No action is executed and the user exits the parameter.
To bus defaults	Every parameter is reset to fieldbus default values.
To fact.defaults	Every parameter is reset to its factory setting.
To delivery set.	Every parameter for which a customer-specific default setting was ordered is reset to this customer-specific value. All other parameters are reset to the factory setting. This option is not visible if no customer-specific settings have been ordered.
Restart device	The restart resets every parameter whose data are in the volatile memory (RAM) to the factory setting (e.g. measured value data). The device configuration remains unchanged.

Activate SW opt.

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

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

User entry Max. 10-digit string consisting of numbers.

Factory setting Depends on the software option ordered

Additional information *Description*

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

User entry

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

NOTE!

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

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

▸ Before you enter a new activation code, make a note of the current activation code .

▸ Enter the new activation code provided by Endress+Hauser when the new software option was ordered.

▸ Once the activation code has been entered, check if the new software option is displayed in the **SW option overv.** parameter (→ 43).

↳ The new software option is active if it is displayed.

↳ If the new software option is not displayed or all software options have been deleted, the code entered was either incorrect or invalid.

▸ If the code entered is incorrect or invalid, enter the old activation code .

▸ Have your Endress+Hauser sales organization check the new activation code remembering to specify the serial number or ask for the code again.

Example for a software option

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

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 43).

SW option overv.

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

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

User interface
- Extend. HistoROM
- HBT Monitoring
- HBT Verification

Additional information

Description

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

"Extend. HistoROM" option

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

"HBT Verification" option and "HBT Monitoring" option

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

Sens. emerg.mode

Navigation Expert → System → Administration → Sens. emerg.mode (2566)

Prerequisite 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

This parameter becomes visible if the data in the S-DAT or on-board memory cannot be read on account of a defect or error. There is a copy of the data on the HistoROM (FT10). If the emergency mode is activated, this copy is used and the device measure correctly again at least up until the next device switch-off/switch-on. After switch-on/switch-off, the emergency mode would have to be reactivated again. This ensures that the client can operate the device until a new spare part arrives.

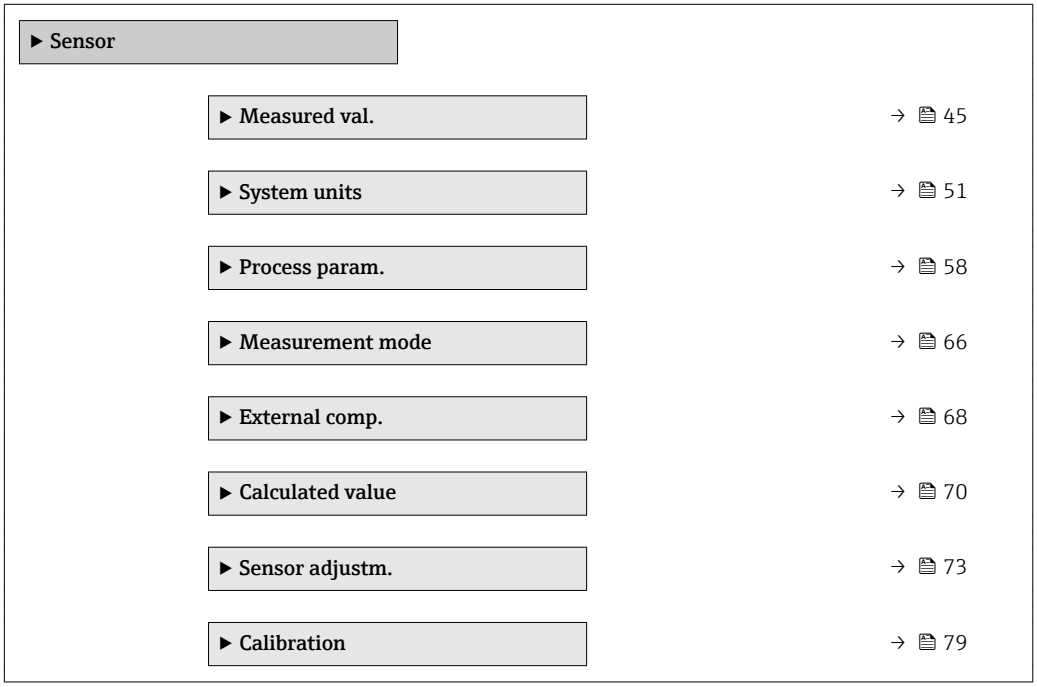
The status signal of the output diagnostic message changes from **F** (failure) to **M** (maintenance required), the diagnostic behavior changes from Alarm to Warning: ⚠**M**. The diagnostic message is output until the characteristics in the sensor data storage are again correct.

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

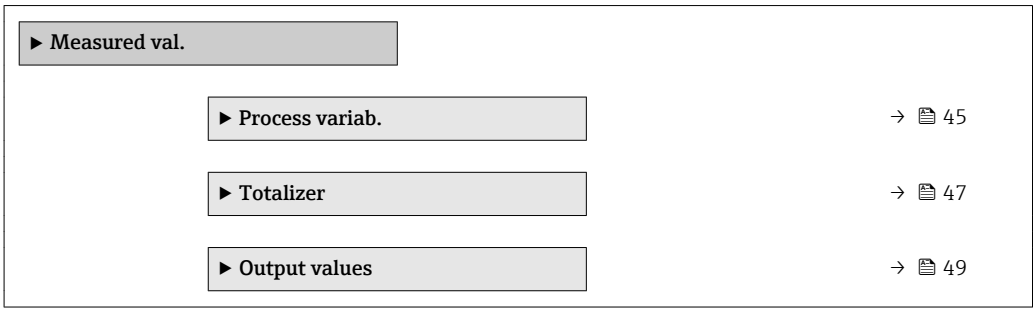
3.2 "Sensor" submenu

Navigation Expert → Sensor



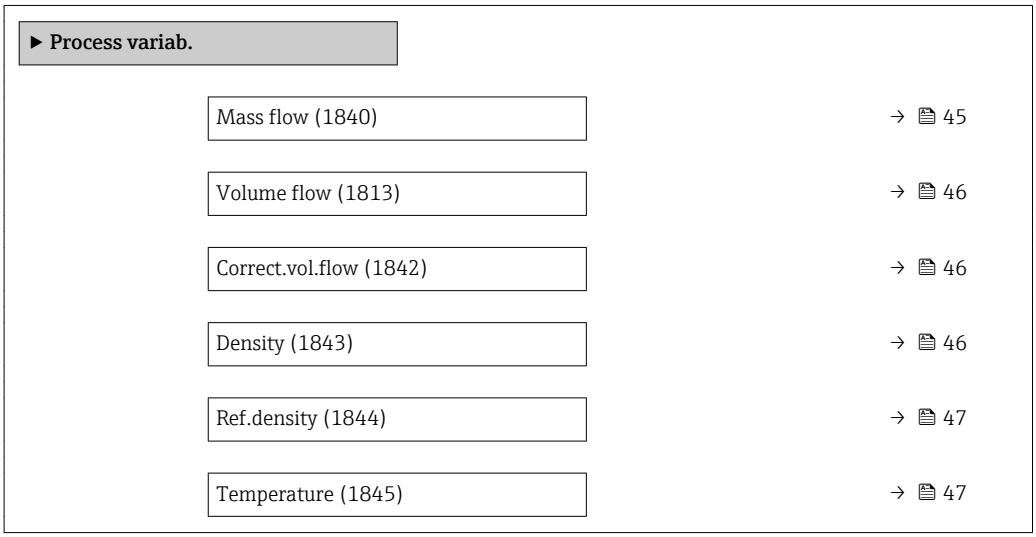
3.2.1 "Measured val." submenu

Navigation Expert → Sensor → Measured val.



"Process variab." submenu

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



Mass flow

Navigation Expert → Sensor → Measured val. → Process variab. → Mass flow (1840)

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

User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Mass flow unit** parameter (→ 51)

Volume flow

Navigation Expert → Sensor → Measured val. → Process variab. → Volume flow (1813)

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

User interface Signed floating-point number

Additional information

Description

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

Dependency

The unit is taken from the **Volume flow unit** parameter (→ 52)

Correct.vol.flow

Navigation Expert → Sensor → Measured val. → Process variab. → Correct.vol.flow (1842)

Description Use this function to view the corrected volume flow currently calculated.

User interface Signed floating-point number

Additional information

Description

The corrected volume flow is derived from the measured mass flow and the reference density of the fluid (density at reference temperature, measured or fixed entry).

Dependency

The unit is taken from the **Cor.volflow unit** parameter (→ 54)

Density

Navigation Expert → Sensor → Measured val. → Process variab. → Density (1843)

Description Use this function to view the currently measured density or its specific gravity.

User interface Positive floating-point number

Additional information

Dependency

The unit is taken from the **Density unit** parameter (→ 55)

Ref.density

Navigation Expert → Sensor → Measured val. → Process variab. → Ref.density (1844)

Description Displays the density at the reference temperature.

User interface Positive floating-point number

Additional information *Description*

The reference density displayed is calculated using the measured density.

Dependency

The unit is taken from the **Ref. dens. unit** parameter (→ 56)

Temperature

Navigation Expert → Sensor → Measured val. → Process variab. → Temperature (1845)

Description Use this function to view the temperature currently measured.

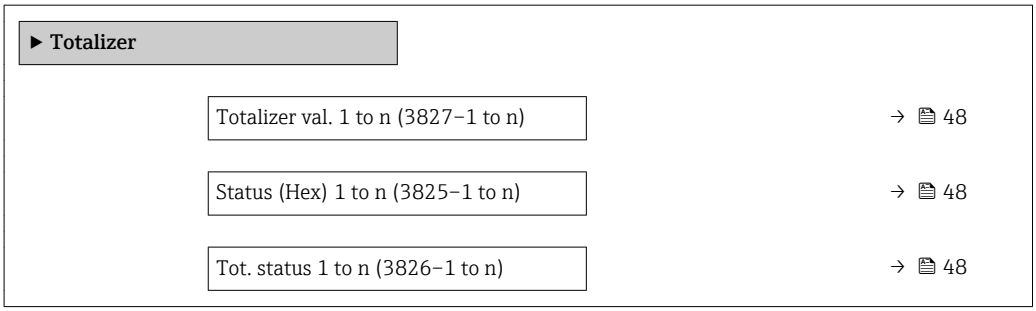
User interface Positive floating-point number

Additional information *Dependency*

The unit is taken from the **Temperature unit** parameter (→ 56)

"Totalizer" submenu

Navigation Expert → Sensor → Measured val. → Totalizer



Totalizer val. 1 to n

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

Prerequisite In the **Target mode** parameter (→ 165), the **Auto** option is selected.

Description Displays the current reading for totalizer 1-3.

User interface Signed floating-point number

Additional information

Description

In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→ 163).

User interface

The value of the process variable totalized since measuring began can be positive or negative. This depends on the settings in the **Operation mode** parameter (→ 162).

Dependency

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 160).

Status (Hex) 1 to n

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

Prerequisite In **Target mode** parameter (→ 165), the **Auto** option is selected.

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

User interface 0 to 0xFF

Tot. status 1 to n

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

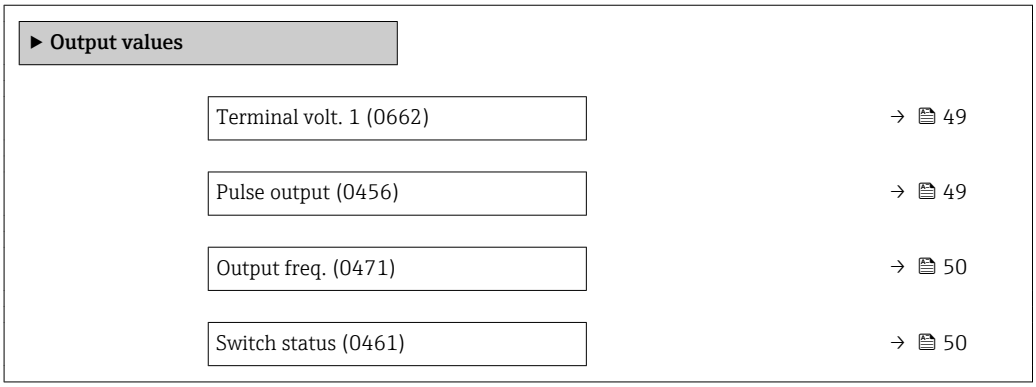
Description Displays the status of the particular totalizer.

User interface

- Good
- Uncertain
- Bad

"Output values" submenu

Navigation Expert → Sensor → Measured val. → Output values



Terminal volt. 1

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

Description Displays the current terminal voltage that is applied at the output.

User interface 0.0 to 50.0 V

Pulse output

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

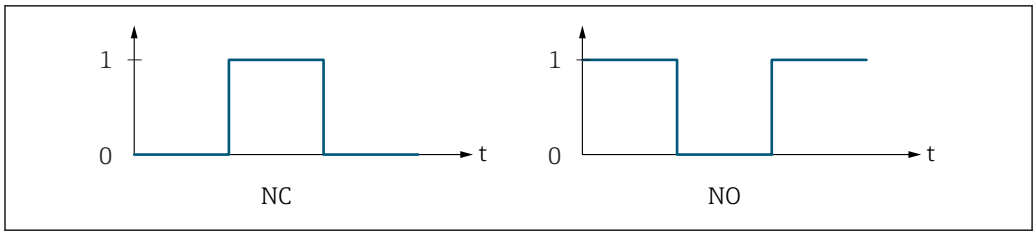
Prerequisite The **Pulse** option is selected in the **Operating mode** parameter (→ 84) parameter.

Description Displays the pulse frequency currently output.

User interface Positive floating-point number

Additional information *Description*

- The pulse output is an open collector output.
- This is configured at the factory in such a way that the transistor is conductive for the duration of the pulse (NO contact) and is safety-oriented.
- The **Value per pulse** parameter (→ 86) and **Pulse width** parameter (→ 86) can be used to define the value (i.e. the measured value amount that corresponds to a pulse) and the duration of the pulse.



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

The output behavior can be reversed via the **Invert outp.sig.** parameter (→ 🖹 103) i.e. the transistor does not conduct for the duration of the pulse.

In addition, the behavior of the output in the event of a device alarm (**Failure mode** parameter (→ 🖹 88)) can be configured.

Output freq.

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

Prerequisite In the **Operating mode** parameter (→ 🖹 84), the **Frequency** option is selected.

Description Displays 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)

Prerequisite The **Switch** option is selected in the **Operating mode** parameter (→ 🖹 84).

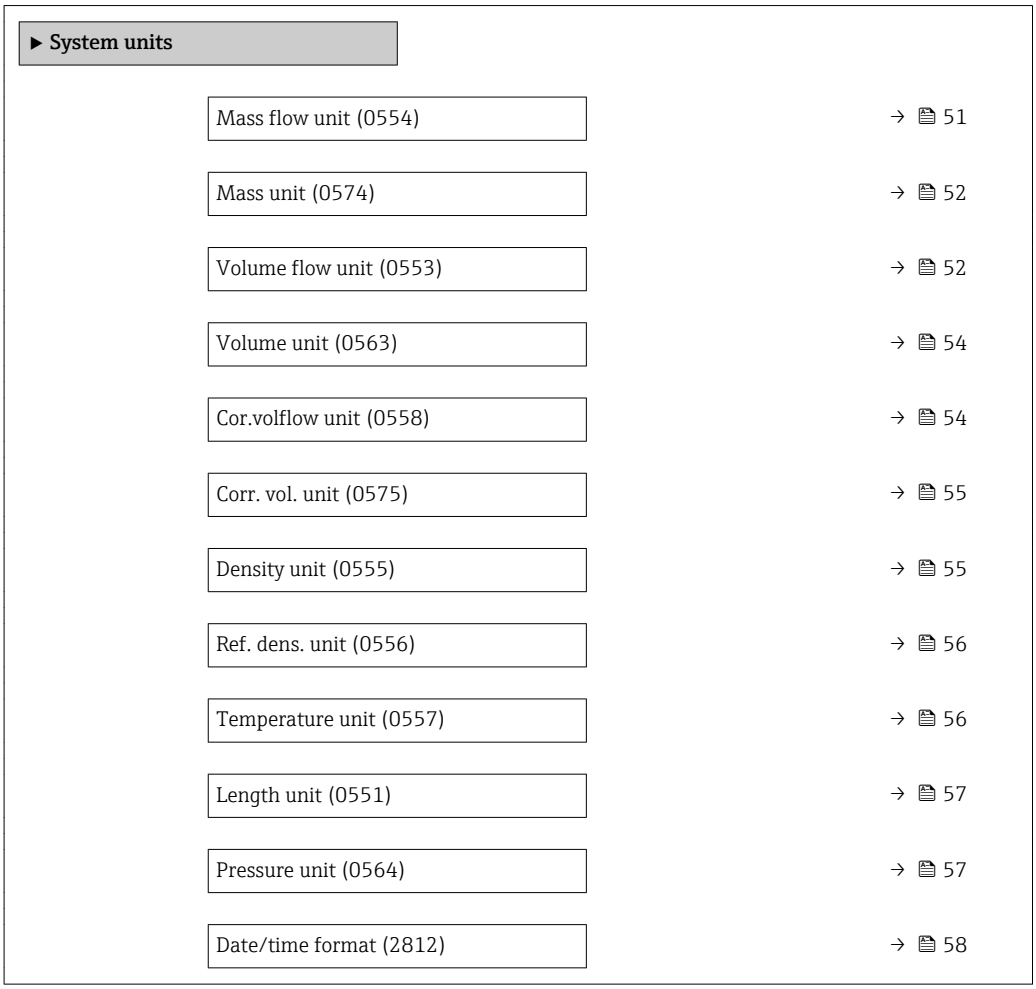
Description Displays the current switch status of the status output.

User interface
- Open
- Closed

Additional information *User interface*
- Open
  The switch output is not conductive.
- Closed
  The switch output is conductive.

3.2.2 "System units" submenu

Navigation Expert → Sensor → System units



Mass flow unit

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

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

Selection

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

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

Factory setting

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

Additional information

Result

The selected unit applies for:
Mass flow parameter (→ 45)

Selection

For an explanation of the abbreviated units: → 212

Mass unit

Navigation

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

Description

Use this function to select the unit for the mass.

Selection

SI units
- g
- kg
- t

US units
- oz
- lb
- STon

Factory setting

Country-specific:
- kg
- lb

Additional information

Selection

For an explanation of the abbreviated units: → 212

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
- cm^3/s
- cm^3/min
- cm^3/h
- cm^3/d
- dm^3/s
- dm^3/min
- dm^3/h
- dm^3/d
- m^3/s
- m^3/min
- m^3/h
- m^3/d
- ml/s
- ml/min
- ml/h
- ml/d
- l/s
- l/min
- l/h
- l/d

US units
- af/s
- af/min
- af/h
- af/d
- ft^3/s
- ft^3/min
- ft^3/h
- ft^3/d
- fl oz/s (us)
- fl oz/min (us)
- fl oz/h (us)
- fl oz/d (us)
- gal/s (us)
- gal/min (us)
- gal/h (us)
- gal/d (us)
- kgal/s (us)
- kgal/min (us)
- kgal/h (us)
- kgal/d (us)
- Mgal/s (us)
- Mgal/min (us)
- Mgal/h (us)
- Mgal/d (us)
- bbl/s (us;liq.)
- bbl/min (us;liq.)
- bbl/h (us;liq.)
- bbl/d (us;liq.)
- bbl/s (us;beer)
- bbl/min (us;beer)
- bbl/h (us;beer)
- bbl/d (us;beer)
- bbl/s (us;oil)
- bbl/min (us;oil)
- bbl/h (us;oil)
- bbl/d (us;oil)
- bbl/s (us;tank)
- bbl/min (us;tank)
- bbl/h (us;tank)
- bbl/d (us;tank)

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

Factory setting

Country-specific:
- l/h
- gal/min (us)

Additional information

Result

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

Selection

For an explanation of the abbreviated units: → 212

Volume unit

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

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

Selection

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

US units
- af
- ft^3
- fl oz (us)
- gal (us)
- kgal (us)
- Mgal (us)
- bbl (us;oil)
- bbl (us;liq.)
- bbl (us;beer)
- bbl (us;tank)

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

Factory setting Country-specific:
- l (DN > 150 (6"): m^3)
- gal (us)

Additional information *Selection*

For an explanation of the abbreviated units: → 212

Cor.volflow unit

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

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

Selection

SI units
- 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
- Sgal/s (us)
- Sgal/min (us)
- Sgal/h (us)
- Sgal/d (us)
- Sbbl/s (us;liq.)
- Sbbl/min (us;liq.)
- Sbbl/h (us;liq.)
- Sbbl/d (us;liq.)
- Sgal/s (imp)
- Sgal/min (imp)
- Sgal/h (imp)
- Sgal/d (imp)

Factory setting

Country-specific:
- Nl/h
- Sft^3/min

Additional information

Result

The selected unit applies for:
Correct.vol.flow parameter (→ 46)

Selection

For an explanation of the abbreviated units: → 212

Corr. vol. unit

Navigation

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

Description

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

Selection

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

US units
- Sft^3
- Sgal (us)
- Sbbl (us;liq.)

Imperial units
Sgal (imp)

Factory setting

Country-specific:
- Nl
- Sft^3

Additional information

Selection

For an explanation of the abbreviated units: → 212

Density unit

Navigation

Expert → Sensor → System units → Density unit (0555)

Description

Use this function to select the unit for the density.

Selection

SI units
- g/cm^3
- g/m^3
- kg/dm^3
- kg/l
- kg/m^3
- SD4°C
- SD15°C
- SD20°C
- SG4°C
- SG15°C
- SG20°C

US units
- lb/ft^3
- lb/gal (us)
- lb/bbl (us;liq.)
- lb/bbl (us;beer)
- lb/bbl (us;oil)
- lb/bbl (us;tank)

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

Factory setting

Country-specific:
- kg/l
- lb/ft³

Additional information

Result

The selected unit applies for:
Density parameter (→ 46)

Selection

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

For an explanation of the abbreviated units: → 212

Ref. dens. unit

Navigation

Expert → Sensor → System units → Ref. dens. unit (0556)

Description

Use this function to select the unit for the reference density.

Selection

SI units
- kg/Nm³
- kg/Nl
- g/Scm³
- kg/Sm³

US units
- lb/Sft³

Factory setting

Country-dependent
- kg/Nl
- lb/Sft³

Additional information

Result

The selected unit applies for:
- **Fix ref.density** parameter (→ 71)
- **Ref.density** parameter (→ 47)

Selection

For an explanation of the abbreviated units: → 212

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:
- **Minimum value** parameter (→ 195)
- **Maximum value** parameter (→ 195)
- **Maximum value** parameter (→ 196)
- **Minimum value** parameter (→ 196)
- **Average value** parameter (→ 196)
- **Minimum value** parameter (→ 197)
- **Maximum value** parameter (→ 197)
- **Minimum value** parameter (→ 198)
- **Maximum value** parameter (→ 198)
- **Ref. temperature** parameter (→ 71)

Selection

For an explanation of the abbreviated units: → 212

Length unit

Navigation

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

Description

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

Selection

SI units
- m
- mm
- µm

US units
- ft
- in

Factory setting

Country-specific:
- mm
- in

Additional information

Selection

For an explanation of the abbreviated units: → 212

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
- kPa a
- MPa a
- bar
- Pa g
- kPa g
- MPa g
- bar g

US units
- psi a
- psi g

Factory setting

Country-specific:
- bar a
- psi a

Additional information

Result

The unit is taken from:
- **Pressure value** parameter (→ 69)
- **External press.** parameter (→ 69)

Selection

For an explanation of the abbreviated units: → 212

Date/time format

Navigation

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

Description

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

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

Factory setting

dd.mm.yy hh:mm

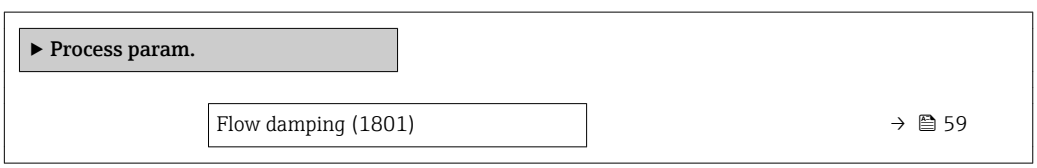
Additional information

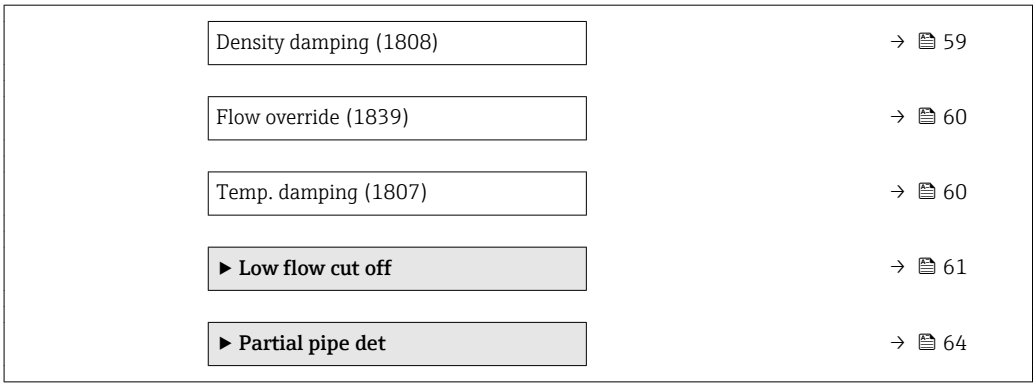
Selection

For an explanation of the abbreviated units: → 212

3.2.3 "Process param." submenu

Navigation Expert → Sensor → Process param.





Flow damping

Navigation Expert → Sensor → Process param. → Flow damping (1801)

Description Use this function to enter a value for 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 0 s

Additional information

User entry

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

Result

The damping affects the following variables of the device:
- Outputs → 82
- Low flow cut off → 61
- Totalizers → 159

Density damping

Navigation Expert → Sensor → Process param. → Density damping (1808)

Description Use this function to enter a value for density damping. Use this parameter to reduce the sensitivity of the measuring signal to fluctuations in the density of the medium. For this purpose, the depth of the density filter is adjusted. The damping is suitable for non-homogeneous liquids, for example.

User entry 0 to 999.9 s

Factory setting 0 s

Additional information *Result*

The damping has an effect on the following process variables:
- Density (→ 46)
- Ref.density (→ 47)
- Volume flow (→ 46)
- Correct.vol.flow (→ 46)

Flow override

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

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

Selection
- Off
- On

Factory setting Off

Additional information *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: continues to be output
  - Totalizers 1-3: stop being totalized

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

Temp. damping

Navigation Expert → Sensor → Process param. → Temp. damping (1807)

Description Use this function to enter a value for temperature damping. Use this parameter to reduce the sensitivity of the temperature measuring signal to interference peaks. For this purpose, the temperature filter is adjusted.

User entry 0 to 999.9 s

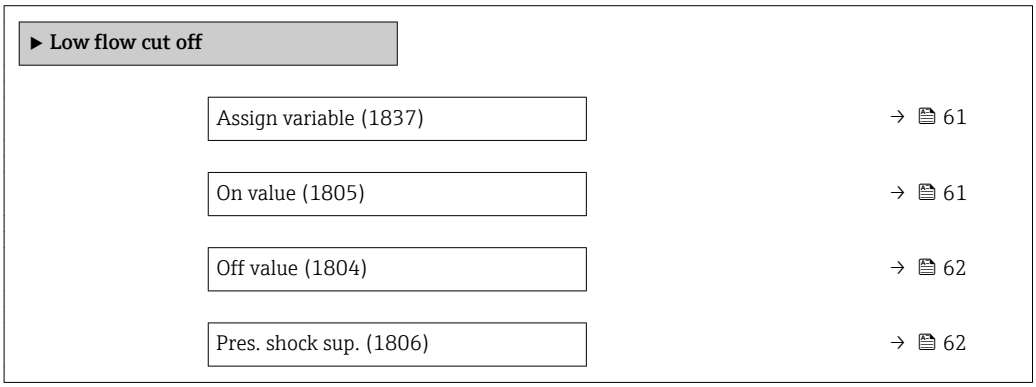
Factory setting 0 s

Additional information *Result*

In addition to the temperature, the damping has an effect on the following temperature-dependent process variables:
- Ref.density (→ 47)
- Correct.vol.flow (→ 46)

"Low flow cut off" submenu

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



Assign variable

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

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

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

Factory setting Mass flow

On value

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

Prerequisite A process variable is selected in the **Assign variable** parameter (→ 61).

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 → 62.

User entry Positive floating-point number

Factory setting Depends on country and nominal diameter→ 209

Additional information *Dependency*

The unit depends on the process variable selected in the **Assign variable** parameter (→ 61).

Off value

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

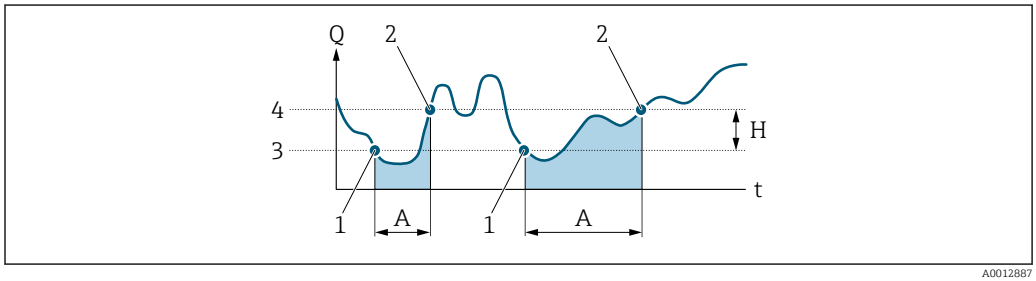
Prerequisite A process variable is selected in the **Assign variable** parameter (→ 61).

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→ 61.

User entry 0 to 100.0 %

Factory setting 50 %

Additional information *Example*



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

Pres. shock sup.

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

Prerequisite A process variable is selected in the **Assign variable** parameter (→ 61).

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

User entry 0 to 100 s

Factory setting 0 s

Additional information

Description

Pressure shock suppression is enabled

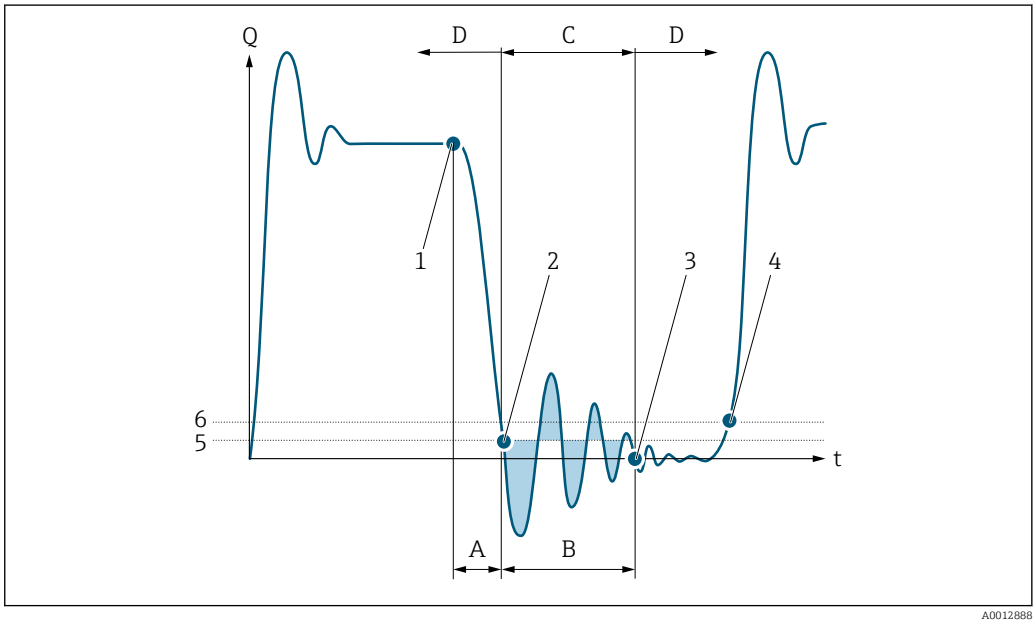
- Prerequisite:
  - Flow rate < on-value of low flow cut off
    or
  - Changing the flow direction
- Output values
  - Flow displayed: 0
  - Totalizer: the totalizers are pegged at the last correct value

Pressure shock suppression is disabled

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

Example

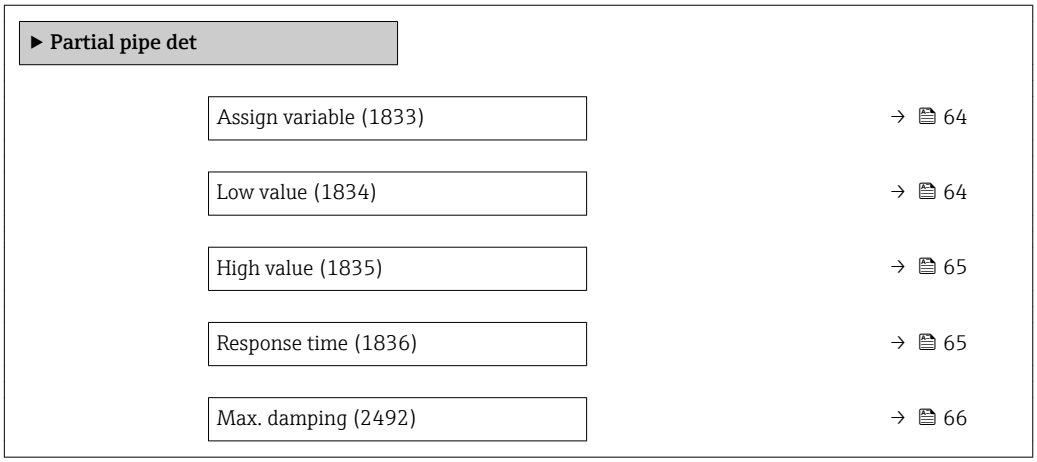
When closing a valve, momentarily strong fluid movements may occur in the pipeline, which are registered by the measuring system. These totalized flow values lead to a false totalizer status, particularly during batching processes.



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

"Partial pipe det" submenu

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



Assign variable

Navigation Expert → Sensor → Process param. → Partial pipe det → Assign variable (1833)

Description Use this function to select a process variable to detect empty or partially filled measuring tubes. For gas measurement: Deactivate monitoring due to low gas density.

Selection
- Off
- Density
- Ref.density

Factory setting Off

Low value

Navigation Expert → Sensor → Process param. → Partial pipe det → Low value (1834)

Prerequisite One of the following options is selected in the **Assign variable** parameter (→ 64):
- Density
- Ref.density

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

User entry Positive floating-point number

Factory setting 200

Additional information *User entry*

The lower limit value must be less than the upper limit value that is specified in the **High value** parameter (→ 65).

The unit depends on the process variable selected in the **Assign variable** parameter (→ 64).

High value

Navigation Expert → Sensor → Process param. → Partial pipe det → High value (1835)

Prerequisite One of the following options is selected in the **Assign variable** parameter (→ 64):
- Density
- Ref.density

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

User entry Signed floating-point number

Factory setting 6 000

Additional information *User entry*

The upper limit value must be greater than the lower limit value, that is specified in the **Low value** parameter (→ 64).

The unit depends on the process variable selected in the **Assign variable** parameter (→ 64).

Response time

Navigation Expert → Sensor → Process param. → Partial pipe det → Response time (1836)

Prerequisite One of the following options is selected in the **Assign variable** parameter (→ 64):
- Density
- Ref.density

Description Use this parameter to enter the time period until the diagnostic message ⚠**S862 Partly filled** appears in the case of a partially filled or empty measuring tube.

User entry 0 to 100 s

Factory setting 1 s

Max. damping

Navigation Expert → Sensor → Process param. → Partial pipe det → Max. damping (2492)

Prerequisite One of the following options is selected in the **Assign variable** parameter (→ 64):
- Density
- Ref.density

Description Use this function to enter a damping value to enable detection of empty or partially filled measuring tubes.

User entry Positive floating-point number

Factory setting 0

Additional information *Description*

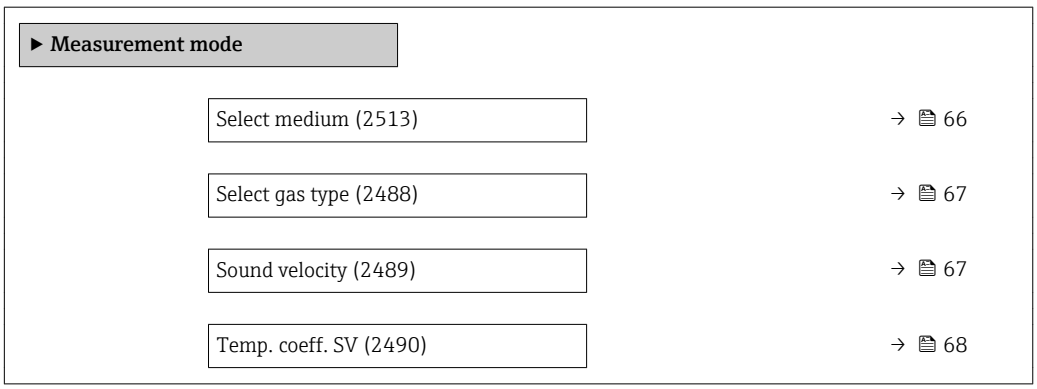
In the case of non-homogeneous media or air pockets, the damping of the measuring tubes increases. If the set value is exceeded, the diagnostic message ⚠**S862 Partly filled** is displayed.

User entry

The parameter is enabled only if the input value is greater than **0**.

3.2.4 "Measurement mode" submenu

Navigation Expert → Sensor → Measurement mode



Select medium

Navigation Expert → Sensor → Measurement mode → Select medium (2513)

Description Use this function to select the type of medium.

Selection
- Liquid
- Gas

Factory setting Liquid

Select gas type

Navigation Expert → Sensor → Measurement mode → Select gas type (2488)

Prerequisite In the **Select medium** parameter (→ 66) the **Gas** option is selected.

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

Selection
- Air
- Ammonia NH3
- Neon Ne
- Argon Ar
- Sulf. hex.fl.SF6
- Oxygen O2
- Ozone O3
- Nitrog. ox. NOx
- Nitrogen N2
- Nitrous ox. N2O
- Methane CH4
- Hydrogen H2
- Helium He
- Hydrog.chlor.HCl
- Hydrog.sulf. H2S
- Ethylene C2H4
- Carbon diox. CO2
- Carbon monox. CO
- Chlorine Cl2
- Butane C4H10
- Propane C3H8
- Propylene C3H6
- Ethane C2H6
- Others
- Krypton Kr
- Xenon Xe
- Vinyl Chloride
- Sulfur diox. SO2

Factory setting Air

Sound velocity

Navigation Expert → Sensor → Measurement mode → Sound velocity (2489)

Prerequisite In the **Select gas type** parameter (→ 67) the **Others** option is selected.

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

User entry 1 to 99 999.9999 m/s

Factory setting 331.5 m/s

Additional information *User entry*
For conversion: 1 m/s= 3.281 ft/s

Temp. coeff. SV

Navigation Expert → Sensor → Measurement mode → Temp. coeff. SV (2490)

Prerequisite In the **Select gas type** parameter (→ 67) the **Others** option is selected.

Description Use this function to enter the temperature coefficient of the sound velocity of the desired gas.

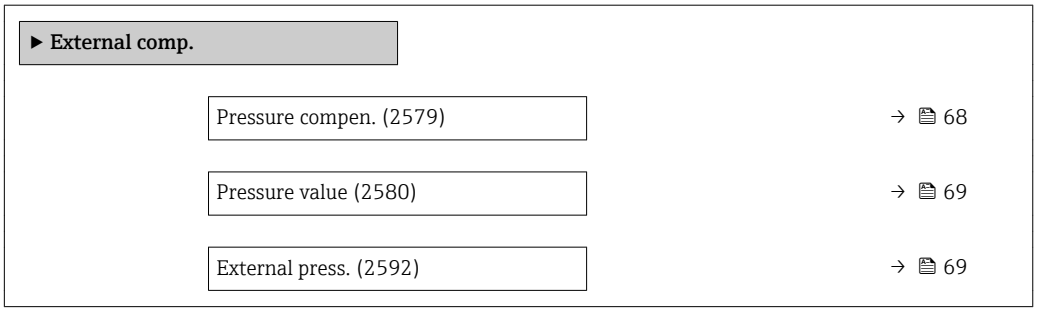
User entry Positive floating-point number

Factory setting 0.61 (m/s)/K

Additional information *User entry*
For conversion: T [K] = 0.555 × T [°F]

3.2.5 "External comp." submenu

Navigation Expert → Sensor → External comp.



Pressure compen.

Navigation Expert → Sensor → External comp. → Pressure compen. (2579)

Description Use this function to switch on automatic pressure correction.

Selection
- Off
- Fixed value
- External value

Factory setting Off

Additional information *Description*

With the automatic pressure correction it is possible to compensate the differential pressure effect between the calibration pressure and process pressure, which affects the measured error of the mass flow or density.

"Off" option

Pressure correction is switched off.

"Fixed value" option

The process pressure for pressure correction is fixed.

The unit is taken from the **Pressure unit** parameter (→ 57)

"External value" option

The process pressure for pressure correction is read in.

Pressure value

Navigation Expert → Sensor → External comp. → Pressure value (2580)

Prerequisite In the **Pressure compen.** parameter (→ 68) the **Fixed value** option is selected.

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

User entry Positive floating-point number

Factory setting Country-specific:
- 1.01 bar a
- 14.7 psi a

Additional information *Dependency*

The unit is taken from the **Pressure unit** parameter (→ 57)

External press.

Navigation Expert → Sensor → External comp. → External press. (2592)

Prerequisite The following conditions are met:
- The **Gas** option is selected in the **Select medium** parameter (→ 66).
- The **External value** option is selected in the **Pressure compen.** parameter (→ 68).

Description Displays the fixed value for the process pressure.

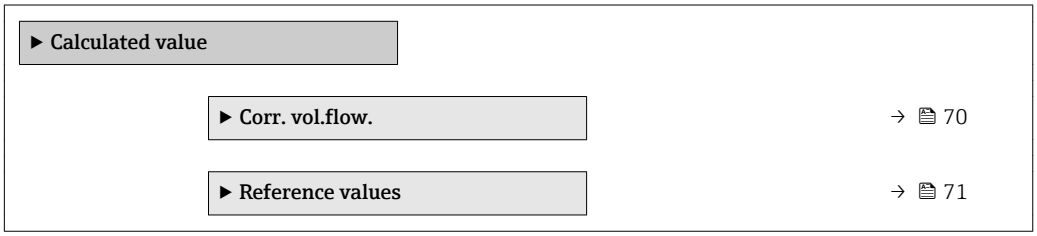
User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Pressure unit** parameter (→ 57)

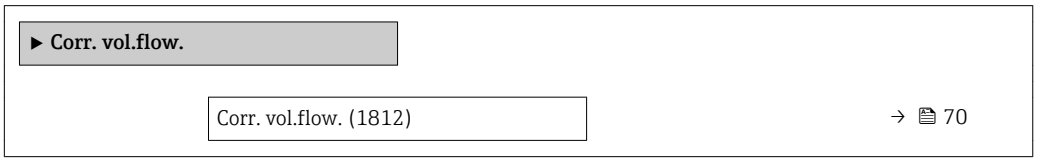
3.2.6 "Calculated value" submenu

Navigation Expert → Sensor → Calculated value



"Corr. vol.flow." submenu

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



Corr. vol.flow.

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

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

Selection
- Fix ref.density
- Calc ref density

Factory setting Calc ref density

Additional information *Selection*

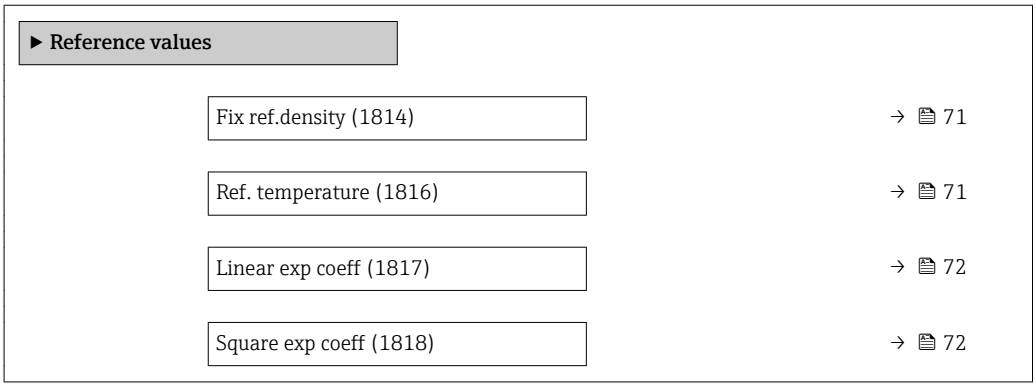
The **Ref. dens API 53** option is suitable only for applications involving LPG [2], where the flow rate is measured on the basis of the corrected volume flow.

Selecting this option means that the reference density is used, taking into account the values in table 53 E of API MPMS section 11.2. Temperature measurement (measured internally or read into the device from an external source) and density measurement take place during operation while the medium is flowing. The mass flow is divided by the reference density to give the corrected volume flow and is issued as an output signal.

2) liquefied petroleum gas

"Reference values" submenu

Navigation Expert → Sensor → Calculated value → Reference values



Fix ref.density

Navigation Expert → Sensor → Calculated value → Reference values → Fix ref.density (1814)

Prerequisite The **Fix ref.density** option is selected in the **Corr. vol.flow.** parameter (→ 70) parameter.

Description Use this function to enter a fixed value for the reference density.

User entry Positive floating-point number

Factory setting 1 kg/Nl

Additional information *Dependency*

The unit is taken from the **Ref. dens. unit** parameter (→ 56)

Ref. temperature

Navigation Expert → Sensor → Calculated value → Reference values → Ref. temperature (1816)

Prerequisite The **Calc ref density** option is selected in the **Corr. vol.flow.** parameter (→ 70) parameter.

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

User entry −273.15 to 99 999 °C

Factory setting Country-specific:
- +20 °C
- +68 °F

Additional information

Dependency

The unit is taken from the **Temperature unit** parameter (→ 56)

Reference density calculation

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

A0023403

- ρ_N: reference density
- ρ: fluid density currently measured
- t: fluid temperature currently measured
- t_N: reference temperature at which the reference density is calculated (e.g. 20 °C)
- Δt: t - t_N
- α: linear expansion coefficient of the fluid, unit = [1/K]; K = Kelvin
- β: square expansion coefficient of the fluid, unit = [1/K²]

Linear exp coeff

Navigation Expert → Sensor → Calculated value → Reference values → Linear exp coeff (1817)

Prerequisite The **Calc ref density** option is selected in the **Corr. vol.flow.** parameter (→ 70) parameter.

Description Use this function to enter a linear, fluid-specific expansion coefficient for calculating the reference density.

User entry Signed floating-point number

Factory setting 0.0

Square exp coeff

Navigation Expert → Sensor → Calculated value → Reference values → Square exp coeff (1818)

Prerequisite The **Calc ref density** option is selected in the **Corr. vol.flow.** parameter (→ 70) parameter.

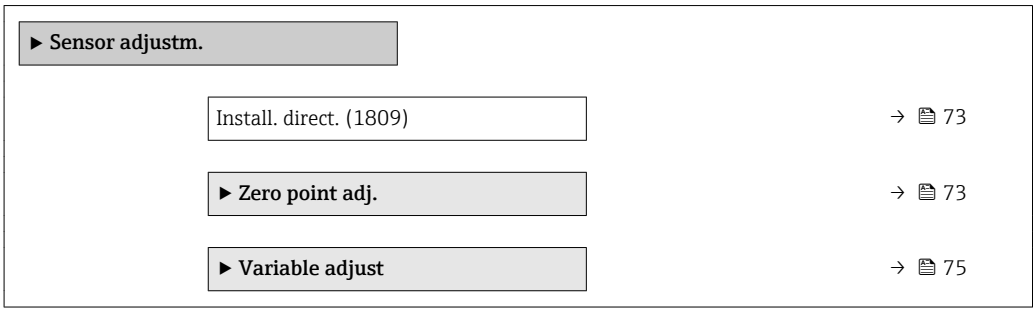
Description For fluid with a non-linear expansion pattern: use this function to enter a quadratic, fluid-specific expansion coefficient for calculating the reference density.

User entry Signed floating-point number

Factory setting 0.0

3.2.7 "Sensor adjustm." submenu

Navigation Expert → Sensor → Sensor adjustm.



Install. direct.

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

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

Selection
- In arrow direct.
- Against arrow

Factory setting In arrow direct.

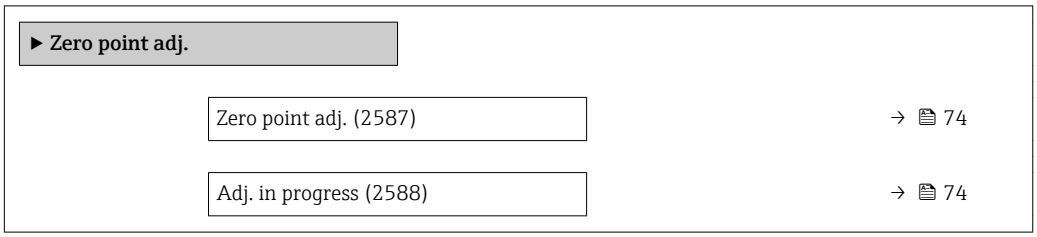
Additional information *Description*

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

"Zero point adj." submenu

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

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



Zero point adj.

Navigation Expert → Sensor → Sensor adjustm. → Zero point adj. → Zero point adj. (2587)

Description Use this parameter to start automatic zero point adjustment.

Selection
- Cancel
- Busy
- Zero adjust fail
- Start

Factory setting Cancel

Additional information *Description*

During calibration, the **Busy** option and the **Adj. in progress** parameter (→ 74) appear beneath the parameter. If the sensor is defective or flow is present, the **Zero adjust fail** option appears on the display. At the same time, this event is entered in the event logbook (event list) → 181.

The new zero point value determined by the measuring device is displayed in the **Zero point** parameter (→ 80).

Information on the procedure for performing zero point adjustment is provided in the Operating Instructions for the device.

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

Adj. in progress

Navigation Expert → Sensor → Sensor adjustm. → Zero point adj. → Adj. in progress (2588)

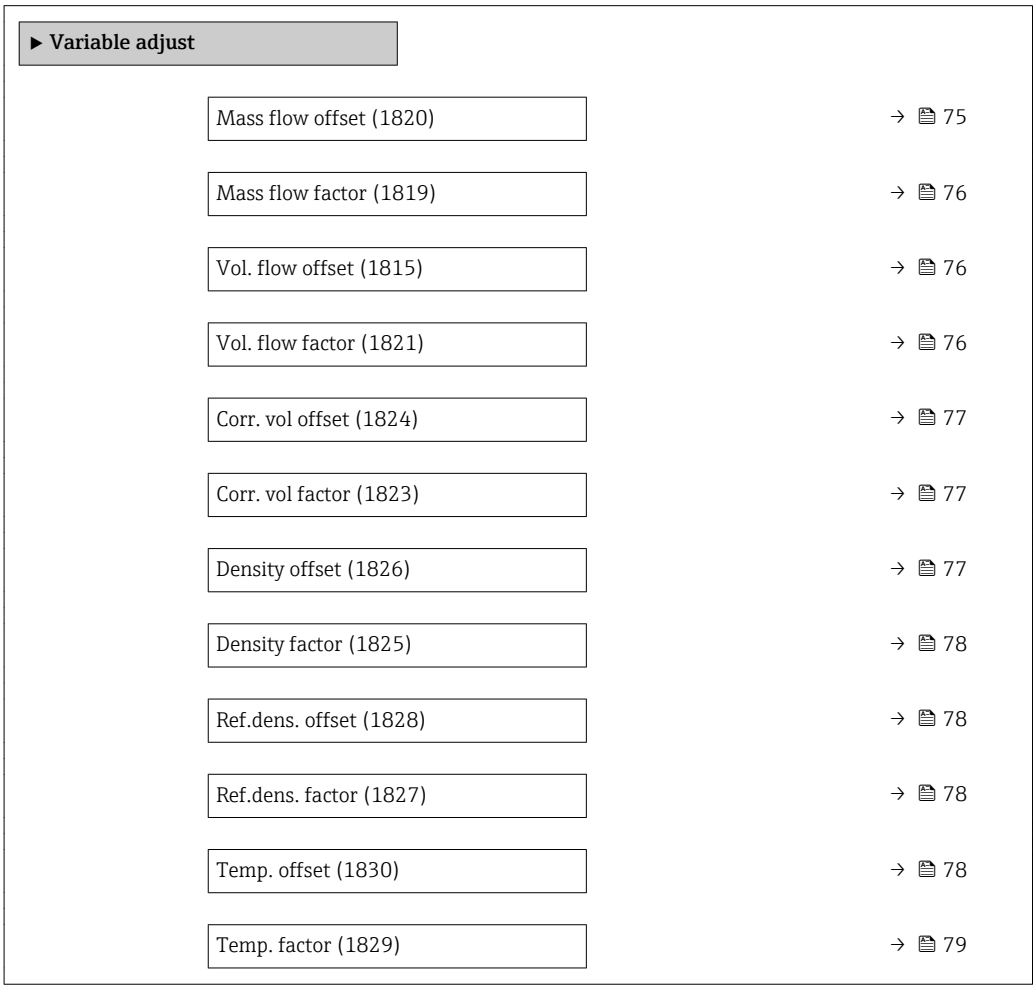
Prerequisite The **Start** option is selected in the **Zero point adj.** parameter (→ 74).

Description Displays the current status of the zero point adjustment via a progress bar.

User interface 0 to 100 %

"Variable adjust" submenu

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust



Mass flow offset

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Mass flow offset (1820)

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 (1819)

Description Use this function to enter a quantity factor (without time) for the mass flow. This factor refers in each case to the mass flow of 1 kg/s.

User entry Positive floating-point number

Factory setting 1

Vol. flow offset

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Vol. flow offset (1815)

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

Vol. flow factor

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Vol. flow factor (1821)

Description Use this function to enter a quantity factor (without time) for the volume flow. This factor refers in each case to the volume of 1 m^3/s.

User entry Positive floating-point number

Factory setting 1

Corr. vol offset

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol offset (1824)

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

Corr. vol factor

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol factor (1823)

Description Use this function to enter a quantity factor (without time) for the corrected volume flow. This factor refers in each case to the standard volume of 1 Nm^3/s.

User entry Positive floating-point number

Factory setting 1

Density offset

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Density offset (1826)

Description Use this parameter to enter the zero point shift for the density trim. The density unit on which the shift is based is 1 kg/m^3.

User entry Signed floating-point number

Factory setting 0 kg/m^3

Additional information *Description*

Corrected value = (factor × value) + offset

Density factor

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Density factor (1825)

Description Use this function to enter a quantity factor for the density. This factor refers in each case to the density of 1 kg/m³.

User entry Positive floating-point number

Factory setting 1

Ref.dens. offset

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Ref.dens. offset (1828)

Description Use this parameter to enter the zero point shift for the reference density trim. The standard density unit on which the shift is based is 1 kg/Nm³.

User entry Signed floating-point number

Factory setting 0 kg/Nm³

Additional information *Description*

Corrected value = (factor × value) + offset

Ref.dens. factor

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Ref.dens. factor (1827)

Description Use this function to enter a quantity factor for the reference density. This factor refers in each case to the reference density of 1 kg/Nm³.

User entry Positive floating-point number

Factory setting 1

Temp. offset

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Temp. offset (1830)

Description Use this function to enter the zero point shift for the temperature trim. The temperature on which the shift is based is entered in Kelvin.

User entry Signed floating-point number

Factory setting 0 K

Additional information *Description*

Corrected value = (factor × value) + offset

Temp. factor

Navigation Expert → Sensor → Sensor adjustm. → Variable adjust → Temp. factor (1829)

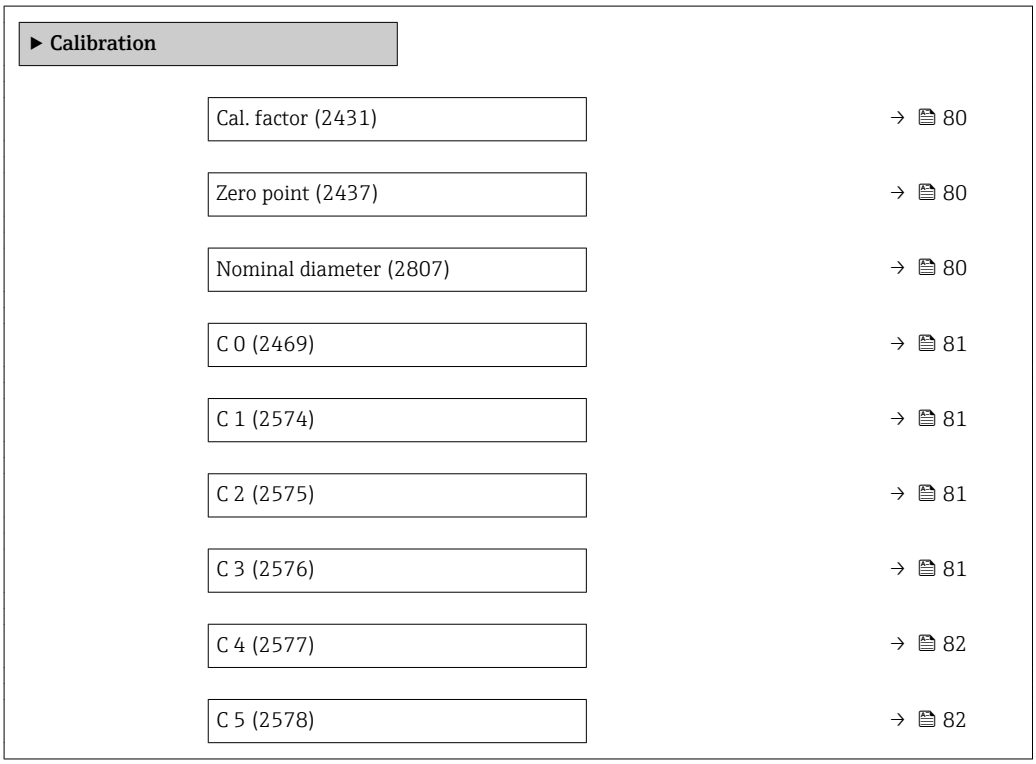
Description Use this parameter to enter a factor by which the temperature in Kelvin is multiplied.

User entry Positive floating-point number

Factory setting 1

3.2.8 "Calibration" submenu

Navigation Expert → Sensor → Calibration



Cal. factor

Navigation Expert → Sensor → Calibration → Cal. factor (2431)

Description Displays the current calibration factor for the sensor.

User interface Signed floating-point number

Factory setting Depends on nominal diameter and calibration

Additional information *Description*

The value is also specified on the sensor nameplate.

Zero point

Navigation Expert → Sensor → Calibration → Zero point (2437)

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

User entry Signed floating-point number

Factory setting 0

Additional information *Description*

The value is also specified on the sensor nameplate.

Nominal diameter

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

Description Displays the nominal diameter of the sensor.

User interface DNxx / x"

Factory setting Depends on the size of the sensor

Additional information *Description*

The value is also specified on the sensor nameplate.

C 0

Navigation Expert → Sensor → Calibration → C 0 (2469)

Description Displays the current density coefficient C0 of the sensor.

Additional information *Description*

A density trim can alter the calibration value of the density coefficient.

C 1

Navigation Expert → Sensor → Calibration → C 1 (2574)

Description Displays the current density coefficient C1 of the sensor.

Additional information *Description*

A density trim can alter the calibration value of the density coefficient.

C 2

Navigation Expert → Sensor → Calibration → C 2 (2575)

Description Displays the current density coefficient C2 of the sensor.

Additional information *Description*

A density trim can alter the calibration value of the density coefficient.

C 3

Navigation Expert → Sensor → Calibration → C 3 (2576)

Description Displays the current density coefficient C3 of the sensor.

Additional information *Description*

A density trim can alter the calibration value of the density coefficient.

C 4

Navigation Expert → Sensor → Calibration → C 4 (2577)

Description Displays the current density coefficient C4 of the sensor.

Additional information *Description*

A density trim can alter the calibration value of the density coefficient.

C 5

Navigation Expert → Sensor → Calibration → C 5 (2578)

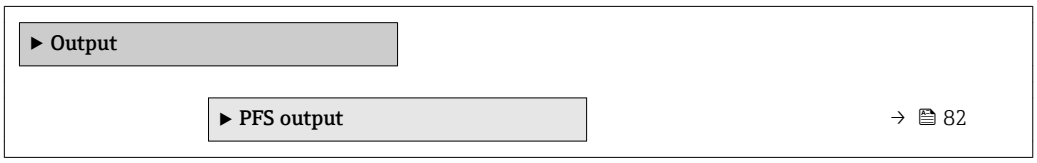
Description Displays the current density coefficient C5 of the sensor.

Additional information *Description*

A density trim can alter the calibration value of the density coefficient.

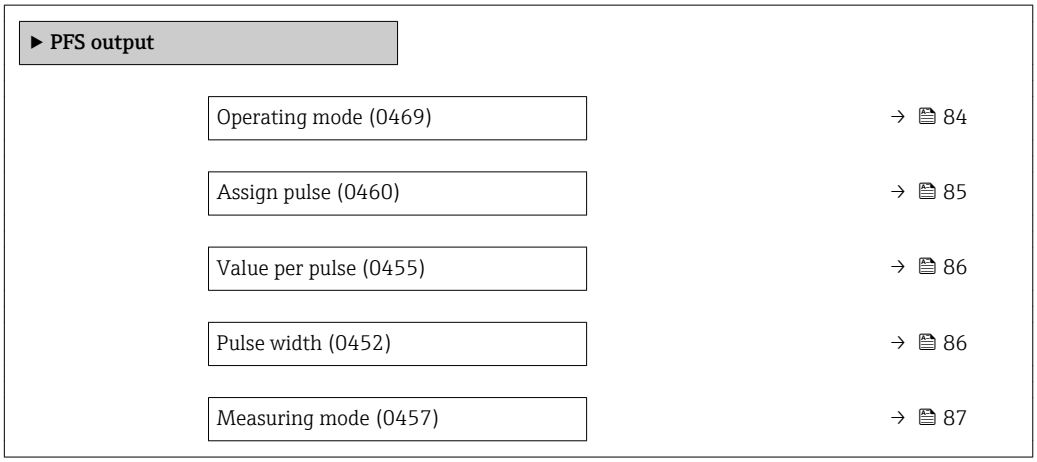
3.3 "Output" submenu

Navigation Expert → Output



3.3.1 "Pulse/frequency/switch output" submenu

Navigation Expert → Output → PFS output



Failure mode (0480)	→ 88
Pulse output (0456)	→ 88
Assign freq. (0478)	→ 89
Min. freq. value (0453)	→ 90
Max. freq. value (0454)	→ 90
Val. at min.freq (0476)	→ 91
Val. at max.freq (0475)	→ 91
Measuring mode (0479)	→ 91
Damping out. (0477)	→ 94
Response time (0491)	→ 94
Failure mode (0451)	→ 95
Failure freq. (0474)	→ 96
Output freq. (0471)	→ 96
Switch out funct (0481)	→ 96
Assign diag. beh (0482)	→ 97
Assign limit (0483)	→ 98
Switch-on value (0466)	→ 99
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Assign dir.check (0484)	→ 100
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Switch-on delay (0467)	→ 101
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Failure mode (0486)	→ 102
Switch status (0461)	→ 102
Invert outp.sig. (0470)	→ 103

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

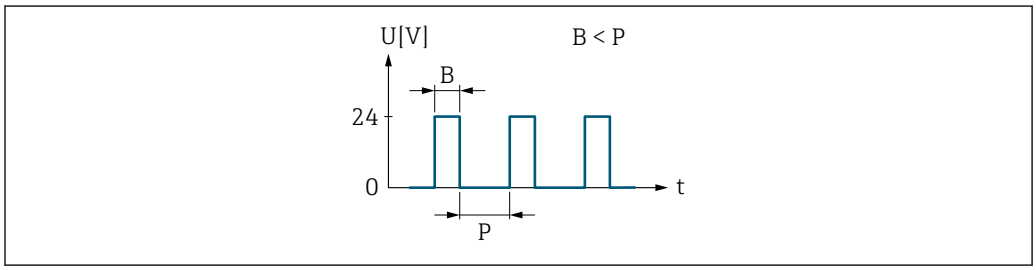
Factory setting Pulse

Additional information

"Pulse" option

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

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



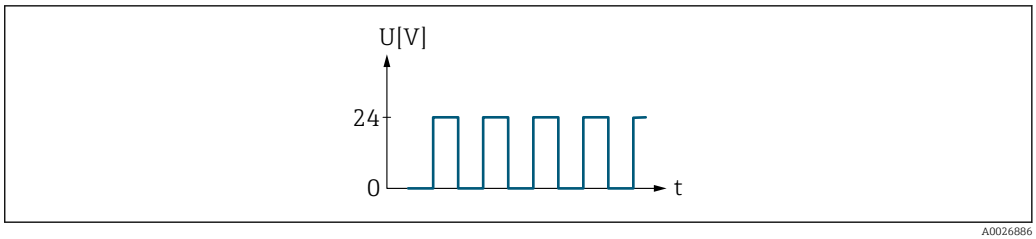
2 *Quantity-proportional pulse (pulse value) with pulse width to be configured*

B Pulse width entered
P Pauses between the individual pulses

"Frequency" option

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

Example
- Flow rate approx. 100 g/s
- Max. frequency 10 kHz
- Flow rate at max. frequency 1 000 g/s
- Output frequency approx. 1 000 Hz

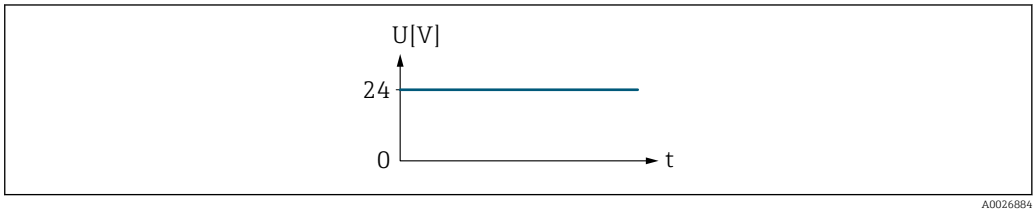


3 *Flow-proportional frequency output*

"Switch" option

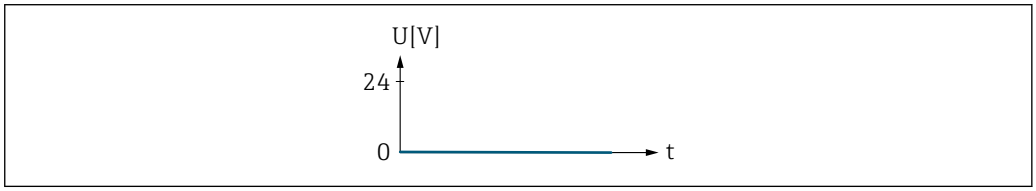
Contact for displaying a condition (e.g. alarm or warning if a limit value is reached)

Example
Alarm response without alarm



4 *No alarm, high level*

Example
Alarm response in case of alarm



5 *Alarm, low level*

Assign pulse

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

Prerequisite The **Pulse** option is selected in the **Operating mode** parameter (→ 84) parameter.

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

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

Factory setting Off

Value per pulse

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

Prerequisite The **Pulse** option is selected in the **Operating mode** parameter (→ 84) and a process variable is selected in the **Assign pulse** parameter (→ 85).

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→ 208

Additional information *User entry*

Weighting of the pulse output with a quantity.

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

Pulse width

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

Prerequisite The **Pulse** option is selected in the **Operating mode** parameter (→ 84) and a process variable is selected in the **Assign pulse** parameter (→ 85).

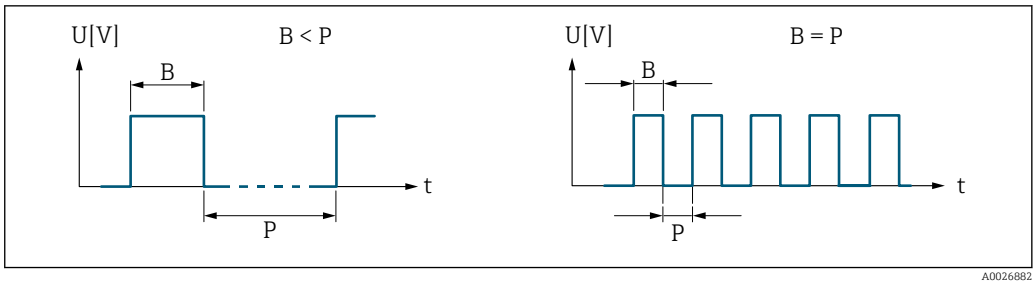
Description Use this function to enter the duration of the output pulse.

User entry 5 to 2 000 ms

Factory setting 100 ms

Additional information *Description*

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



B Pulse width entered
P Pauses between the individual pulses

Example

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

Measuring mode

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

Prerequisite In the **Operating mode** parameter (→ 84), the **Pulse** option is selected, and one of the following options is selected in the **Assign pulse** parameter (→ 85):
- Mass flow
- Volume flow
- Correct.vol.flow

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

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

Factory setting Forward flow

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

For a detailed description of the options available, see the **Measuring mode** parameter (→ 91)

Failure mode

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

Prerequisite The **Pulse** option is selected in the **Operating mode** parameter (→ 84) and a process variable is selected in the **Assign pulse** parameter (→ 85).

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

Selection
- Actual value
- No pulses

Factory setting No pulses

Additional information *Description*

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

Selection

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

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

Pulse output

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

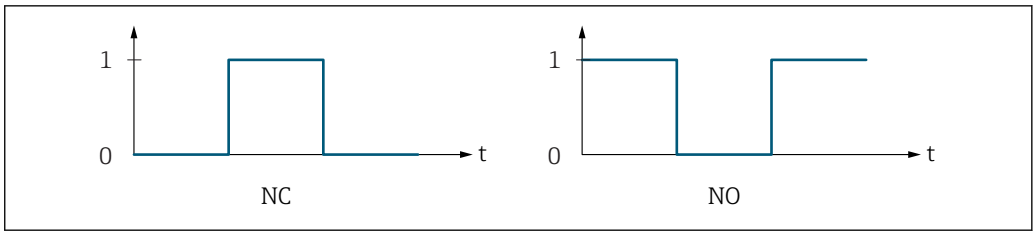
Prerequisite The **Pulse** option is selected in the **Operating mode** parameter (→ 84) parameter.

Description Displays the pulse frequency currently output.

User interface Positive floating-point number

Additional information *Description*

- The pulse output is an open collector output.
- This is configured at the factory in such a way that the transistor is conductive for the duration of the pulse (NO contact) and is safety-oriented.
- The **Value per pulse** parameter (→ 86) and **Pulse width** parameter (→ 86) can be used to define the value (i.e. the measured value amount that corresponds to a pulse) and the duration of the pulse.



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

The output behavior can be reversed via the **Invert outp.sig.** parameter (→ 103) i.e. the transistor does not conduct for the duration of the pulse.

In addition, the behavior of the output in the event of a device alarm (**Failure mode** parameter (→ 88)) can be configured.

Assign freq.

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

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (→ 84) parameter.

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

Selection
- Off
- Mass flow
- Volume flow
- Correct.vol.flow
- Density
- Ref.density
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Oscil. frequency
- Oscil. amplitude
- Oscil. damping
- Signal asymmetry

Factory setting Off

* Visibility depends on order options or device settings

Additional information *Selection*

- Oscil. frequency
  Displays the current oscillation frequency of the measuring tubes. This frequency depends on the density of the medium.
- Oscil. amplitude
  Displays the relative oscillation amplitude of the measuring tubes in relation to the preset value. This value is 100 % under optimum conditions. The value can decrease in the event of low 4 to 20 mA loop currents and/or difficult media (two-phase, high viscosity or high gas velocity).
- Oscil. damping
  Displays the current oscillation damping. Oscillation damping is an indicator of the sensor's current need for excitation power.
- Signal asymmetry
  Displays the relative difference between the oscillation amplitude at the inlet and outlet of the sensor. The measured value is the result of production tolerances of the sensor coils and should remain constant over the life time of a sensor.

Min. freq. value

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

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (→ 84) and a process variable is selected in the **Assign freq.** parameter (→ 89).

Description Use this function to enter the start value frequency.

User entry 0 to 1 000 Hz

Factory setting 0 Hz

Max. freq. value

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

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (→ 84) and a process variable is selected in the **Assign freq.** parameter (→ 89).

Description Use this function to enter the end value frequency.

User entry 0 to 1 000 Hz

Factory setting 1 000 Hz

Val. at min.freq

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

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (→ 84) and a process variable is selected in the **Assign freq.** parameter (→ 89).

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

User entry Signed floating-point number

Factory setting Depends on country and nominal diameter

Additional information *Dependency*

The entry depends on the process variable selected in the **Assign freq.** parameter (→ 89).

Val. at max.freq

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

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (→ 84) and a process variable is selected in the **Assign freq.** parameter (→ 89).

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

User entry Signed floating-point number

Factory setting Depends on country and nominal diameter

Additional information *Description*

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

Dependency

The entry depends on the process variable selected in the **Assign freq.** parameter (→ 89).

Measuring mode

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

Prerequisite In the **Operating mode** parameter (→ 84), the **Frequency** option is selected, and one of the following options is selected in the **Assign freq.** parameter (→ 89):
- Mass flow
- Volume flow
- Correct.vol.flow
- Density

- Ref.density
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Oscil. frequency
- Oscil. amplitude
- Oscil. damping
- Signal asymmetry

Detailed description of the options **Oscil. frequency, Oscil. amplitude, Oscil. damping** and **Signal asymmetry**: **Assign freq.** parameter (→ 89)

Description

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

Selection

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

Factory setting

Forward flow

Additional information

"Forward flow" option

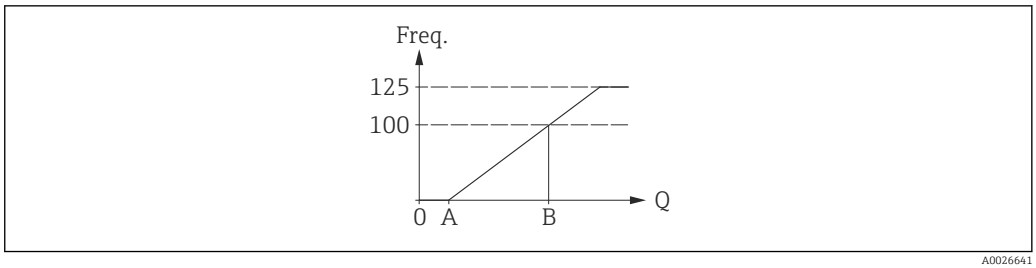
The frequency output signal is proportional to the measured variable assigned. The measuring range is defined by the values that are assigned to the Val. at min.freq (A) and the Val. at max.freq (B).

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

One of the values is defined as equal to zero flow e.g.:
- Val. at min.freq = 0 kg/h
- Val. at max.freq = 10kg/h
  - If the effective flow exceeds or falls below this measured value, no diagnostic message is output and the frequency output retains its value (0 Hz in the example).
  - If the effective flow exceeds or falls below the other measured value, the diagnostic message ⚠**S442 Freq. output** is displayed and the frequency output behaves as configured in the **Failure mode** parameter (→ 95).

Both values are defined such that they are not equal to zero flow e.g.:
- Val. at min.freq = −5 kg/h
- Val. at max.freq = 10kg/h
  If the effective flow exceeds or falls below this measuring range, the diagnostic message ⚠**S442 Freq. output 1 to n** is displayed and the frequency output behaves as configured in the **Failure mode** parameter (→ 95).

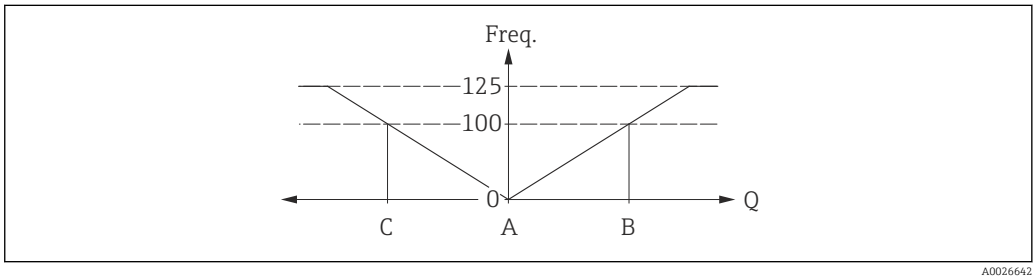
* Visibility depends on order options or device settings



A Val. at min.freq
B Val. at max.freq

"Forward/Reverse" option

The frequency output signal is independent of the direction of flow (absolute amount of the measured variable). The Val. at min.freq (A) and Val. at max.freq (B) must have the same sign (+ or -). The Val. at max.freq (C) (e.g. reverse flow) corresponds to the mirrored Val. at min.freq (e.g. forward flow).



- The flow direction can be output via the configurable relay or status outputs.
- The **Forward/Reverse** option can only be selected if the values in the **Val. at min.freq** parameter (→ 91) and **Val. at max.freq** parameter (→ 91) have the same sign or one of the values is zero.
- The **Forward/Reverse** option cannot be selected if the values have different signs.

"Rev. flow comp." option

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

If buffering cannot be processed within approx. 60 s, the diagnostic message ⚠**S442 Freq. output 1 to n** is displayed.

If buffering cannot be processed within approx. 60 s, the diagnostic message ⚠**S442 Freq. output** 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 frequency output.

Damping out.

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

Prerequisite In the **Operating mode** parameter (→ 84), the **Frequency** option is selected, and one of the following options is selected in the **Assign freq.** parameter (→ 89):
- Mass flow
- Volume flow
- Correct.vol.flow
- Density
- Ref.density
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Oscil. frequency
- Oscil. amplitude
- Oscil. damping
- Signal asymmetry

Detailed description of the options **Oscil. frequency, Oscil. amplitude, Oscil. damping** and **Signal asymmetry**: **Assign freq.** parameter (→ 89)

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

User entry 0 to 999.9 s

Factory setting 0.0 s

Additional information *User entry*

Use this function to enter a time constant (PT1 element [3]) for frequency output damping:
- If a low time constant is entered, the current output reacts particularly quickly to fluctuating measured variables.
- On the other hand, the current output reacts more slowly if a high time constant is entered.

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

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

Response time

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

Prerequisite In the **Operating mode** parameter (→ 84), the **Frequency** option is selected, and one of the following options is selected in the **Assign freq.** parameter (→ 89):
- Mass flow
- Volume flow
- Correct.vol.flow

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

- Density
- Ref.density
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Oscil. frequency
- Oscil. amplitude
- Oscil. damping
- Signal asymmetry

Detailed description of the options **Oscil. frequency, Oscil. amplitude, Oscil. damping** and **Signal asymmetry**: **Assign freq.** parameter (→ 89)

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
  and
- Depending on the measured variable assigned to the output.
  - Flow damping
    or
  - Density damping
    or
  - Temperature damping

Failure mode

Navigation

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

Prerequisite

The **Frequency** option is selected in the **Operating mode** parameter (→ 84) and a process variable is selected in the **Assign freq.** parameter (→ 89).

Description

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

Selection

- Actual value
- Defined value
- 0 Hz

Factory setting

0 Hz

* Visibility depends on order options or device settings

Additional information *Selection*

- Actual value
  In the event of a device alarm, the frequency output continues on the basis of the current flow measurement. The device alarm is ignored.
- Defined value
  In the event of a device alarm, the frequency output continues on the basis of a predefined value. The Failure freq. (→ 96) replaces the current measured value, making it possible to bypass the device alarm. The actual measurement is switched off for the duration of the device alarm.
- 0 Hz
  In the event of a device alarm, the frequency output is "switched off".

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

Failure freq.

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

Prerequisite The **Frequency** option is selected in the **Operating mode** parameter (→ 84) and a process variable is selected in the **Assign freq.** parameter (→ 89).

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

User entry 0.0 to 1250.0 Hz

Factory setting 0.0 Hz

Output freq.

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

Prerequisite In the **Operating mode** parameter (→ 84), the **Frequency** option is selected.

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

User interface 0 to 1250 Hz

Switch out funct

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

Prerequisite The **Switch** option is selected in the **Operating mode** parameter (→ 84).

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

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

Factory setting Off

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

Assign diag. beh

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

Prerequisite
- In the **Operating mode** parameter (→ 84), the **Switch** option is selected.
- In the **Switch out funct** parameter (→ 96), the **Diag. behavior** option is selected.

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

Selection
- Alarm
- Alarm or warning
- Warning

Factory setting Alarm

Additional information

Description

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

Selection

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

Assign limit

Navigation

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

Prerequisite

- The **Switch** option is selected in the **Operating mode** parameter (→ 84) parameter.
- The **Limit** option is selected in the **Switch out funct** parameter (→ 96) parameter.

Description

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

Selection

- Mass flow
- Volume flow
- Correct.vol.flow
- Density
- Ref.density
- Temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3

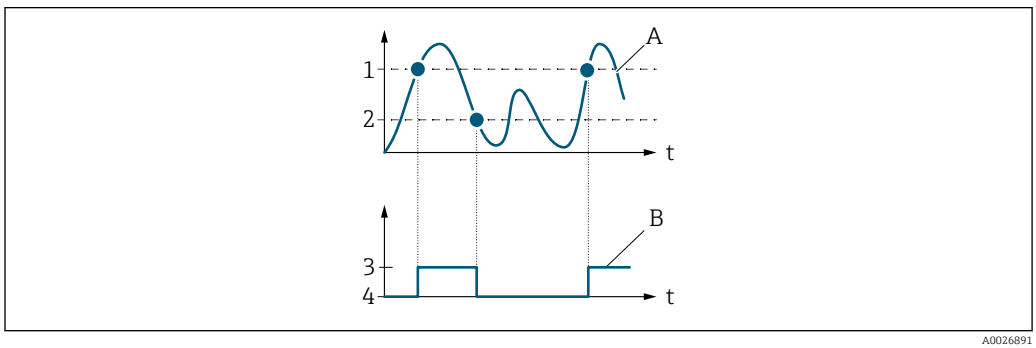
Factory setting

Mass flow

Additional information

Description

Behavior of status output when Switch-on value > Switch-off value:
- Process variable > Switch-on value: transistor is conductive
- Process variable < Switch-off value: transistor is non-conductive



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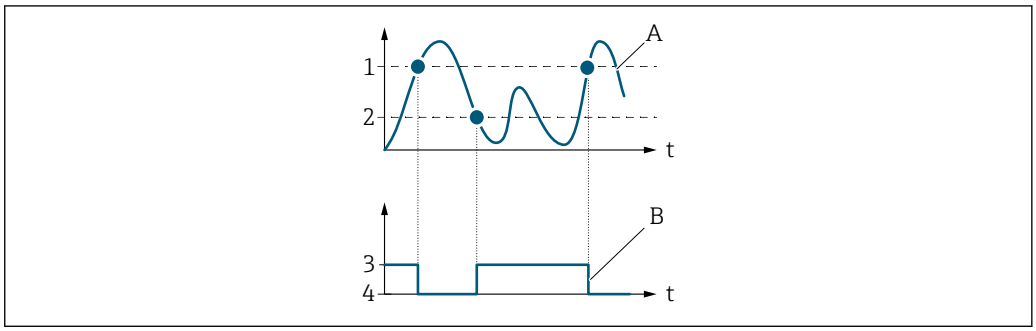
1 Switch-on value
2 Switch-off value
3 Conductive
4 Non-conductive
A Process variable
B Status output

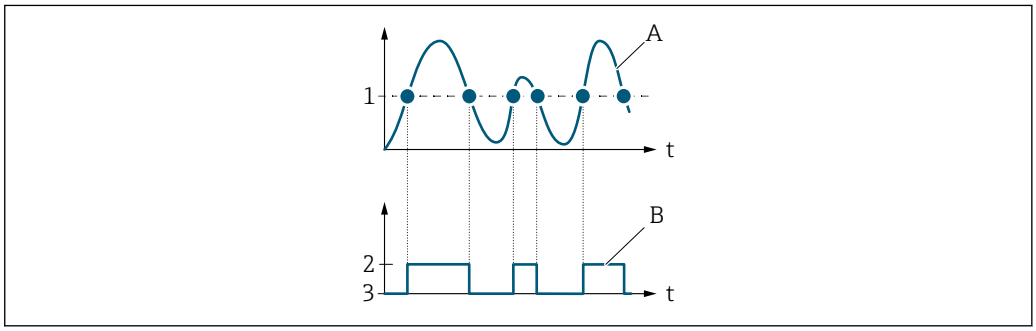
Behavior of status output when Switch-on value < Switch-off value:
- Process variable < Switch-on value: transistor is conductive
- Process variable > Switch-off value: transistor is non-conductive



A0026892

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

Behavior of status output when Switch-on value = Switch-off value:
- Process variable > Switch-on value: transistor is conductive
- Process variable < Switch-off value: transistor is non-conductive



A0026893

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

Switch-on value

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

Prerequisite
- In the **Operating mode** parameter (→ 84), the **Switch** option is selected.
- In the **Switch out funct** parameter (→ 96), the **Limit** option is selected.

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

User entry Signed floating-point number

Factory setting

Country-specific:
- 0 kg/h
- 0 lb/min

Additional information

Description

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

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

Dependency

The unit depends on the process variable selected in the **Assign limit** parameter (→ 98).

Switch-off value

Navigation

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

Prerequisite

- In the **Operating mode** parameter (→ 84), the **Switch** option is selected.
- In the **Switch out funct** parameter (→ 96), the **Limit** option is selected.

Description

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

User entry

Signed floating-point number

Factory setting

Country-specific:
- 0 kg/h
- 0 lb/min

Additional information

Description

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

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

Dependency

The unit depends on the process variable selected in the **Assign limit** parameter (→ 98).

Assign dir.check

Navigation

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

Prerequisite

- The **Switch** option is selected in the **Operating mode** parameter (→ 84).
- The **Fl. direct.check** option is selected in the **Switch out funct** parameter (→ 96).

Description

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

Selection
- Mass flow
- Volume flow
- Correct.vol.flow

Factory setting Mass flow

Assign status

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

Prerequisite
- The **Switch** option is selected in the **Operating mode** parameter (→ 84).
- The **Status** option is selected in the **Switch out funct** parameter (→ 96).

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

Selection
- Partial pipe det
- Low flow cut off
- Digital outp. 3

Factory setting Partial pipe det

Additional information *Options*

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

Switch-on delay

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

Prerequisite
- The **Switch** option is selected in the **Operating mode** parameter (→ 84).
- The **Limit** option is selected in the **Switch out funct** parameter (→ 96).

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)

Prerequisite
- The **Switch** option is selected in the **Operating mode** parameter (→ 84).
- The **Limit** option is selected in the **Switch out funct** parameter (→ 96).

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 a failsafe mode for the switch output in the event of a device alarm.

Selection
- Actual status
- Open
- Closed

Factory setting Open

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

Switch status

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

Prerequisite The **Switch** option is selected in the **Operating mode** parameter (→ 84).

Description Displays the current switch status of the status output.

User interface
- Open
- Closed

Additional information *User interface*
- Open
  The switch output is not conductive.
- Closed
  The switch output is conductive.

Invert outp.sig.

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

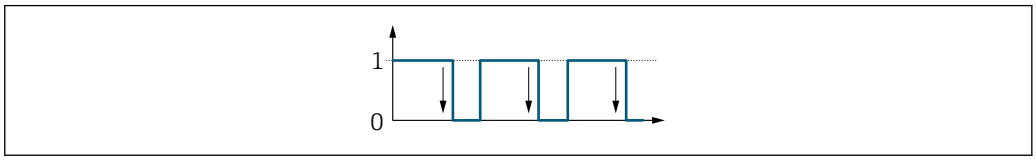
Description Use this function to select whether to invert the output signal.

Selection
- No
- Yes

Factory setting No

Additional information *Selection*

No option (passive - negative)



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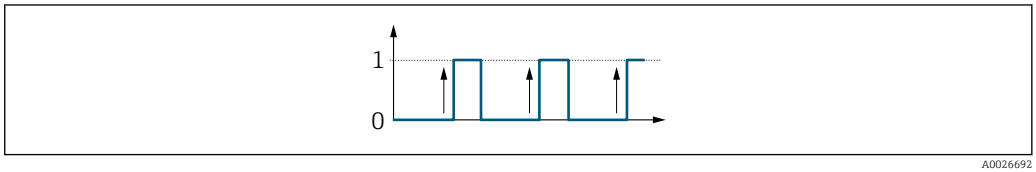
Yes option (passive - positive)



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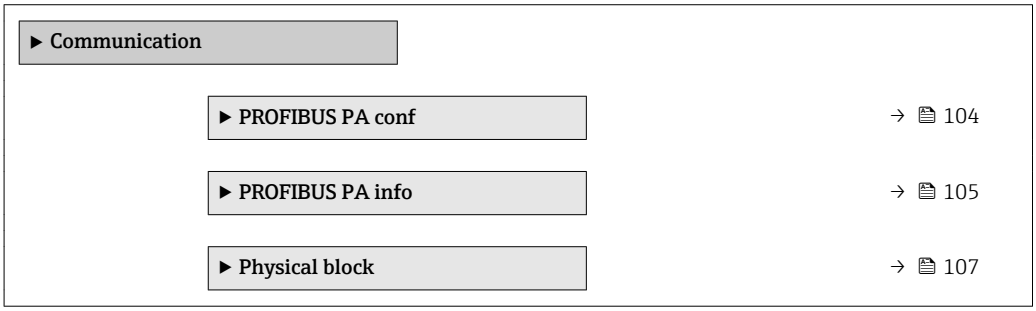
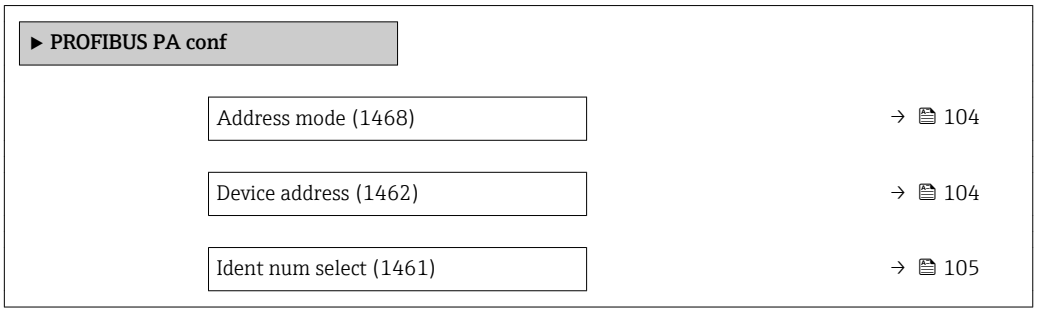
3.4 "Communication" submenu

Navigation Expert → Communication



3.4.1 "PROFIBUS PA conf" submenu

Navigation Expert → Communication → PROFIBUS PA conf



Address mode

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

Description Displays the configured address mode.

User interface
- Hardware
- Software

Factory setting Software

Additional information *Description*

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

Device address

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

Description Use this function to enter the device address.

User entry 0 to 126

Factory setting 126

Additional information *Description*

The address must always be configured for a PROFIBUS device. The valid address range is between 1 and 126. In a PROFIBUS network, each address can only be assigned once. If an address is not configured correctly, the device is not recognized by the master. All measuring devices are delivered from the factory with the device address 126 and with the software addressing method.

Displays the configured address mode: **Address mode** parameter (→ 104)

Ident num select

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

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

Selection
- Automatic mode
- Promass 200
- 3AI,1Tot(0x9742)
- 2AI,1Tot(0x9741)
- 1AI,1Tot(0x9740)

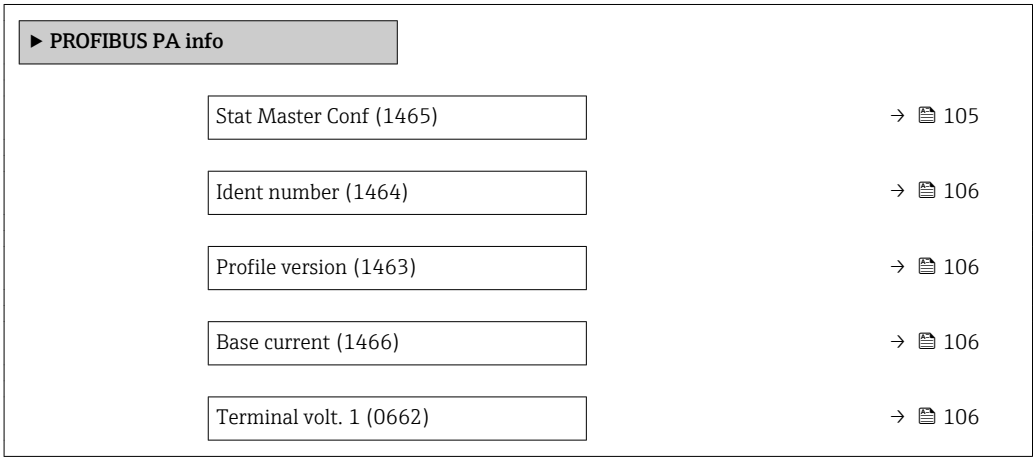
Factory setting Automatic mode

Additional information *Description*

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

3.4.2 "PROFIBUS PA info" submenu

Navigation Expert → Communication → PROFIBUS PA info



Stat Master Conf

Navigation Expert → Communication → PROFIBUS PA info → Stat Master Conf (1465)

Description For displaying the status of the PROFIBUS Master configuration.

User interface
- Active
- Not active

Factory setting Not active

Ident number

Navigation Expert → Communication → PROFIBUS PA info → Ident number (1464)

Description For displaying the PROFIBUS identification number.

User interface 0 to FFFF

Factory setting 0x155F

Profile version

Navigation Expert → Communication → PROFIBUS PA info → Profile version (1463)

Description Displays the profile version.

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

Factory setting 3.02

Base current

Navigation Expert → Communication → PROFIBUS PA info → Base current (1466)

Description Displays the basic current: Every PA measuring device taps a constant basic current from the MBP cable. This base current must be at least 10 mA. The base current enables power to be supplied to the measuring device.

User interface 15 mA

Terminal volt. 1

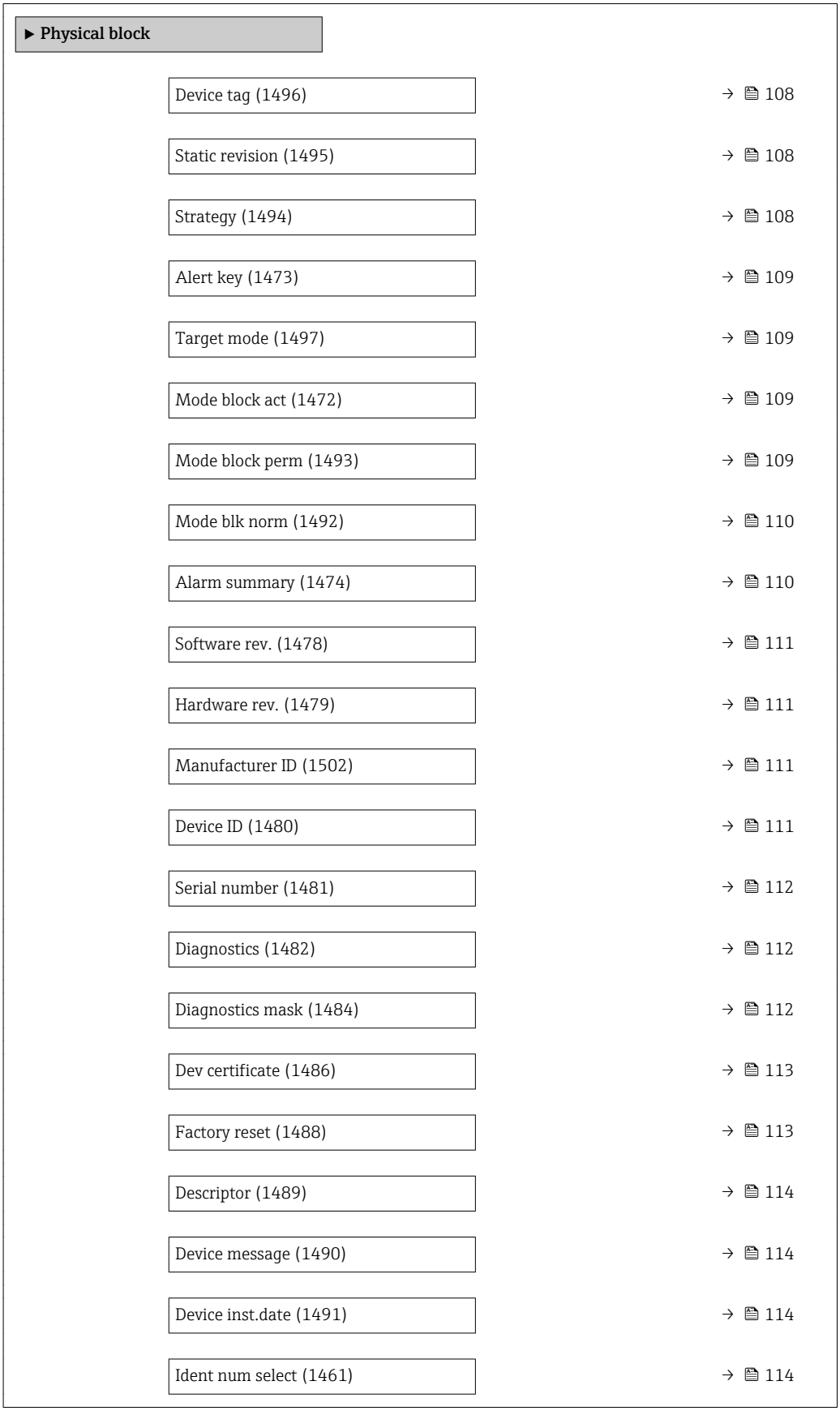
Navigation Expert → Communication → PROFIBUS PA info → Terminal volt. 1 (0662)

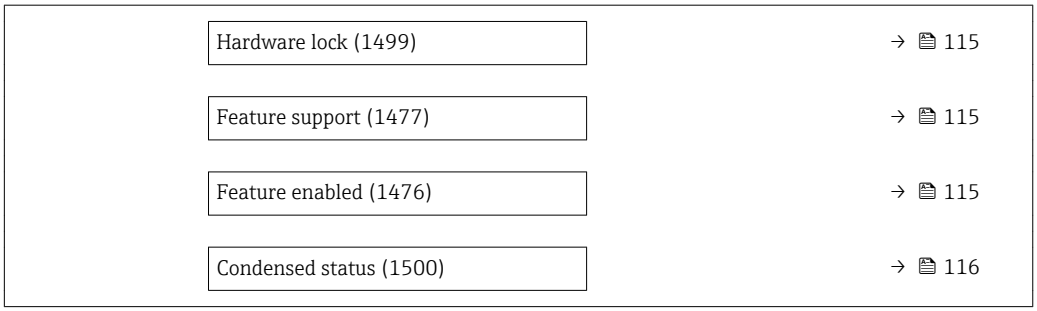
Description Displays the current terminal voltage that is applied at the output.

User interface 0.0 to 50.0 V

3.4.3 "Physical block" submenu

Navigation Expert → Communication → Physical block





Device tag

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

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

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

Factory setting Promass 200

Static revision

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

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

User interface 0 to FFFF

Additional information *Description*

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

Strategy

Navigation Expert → Communication → Physical block → Strategy (1494)

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

User entry 0 to FFFF

Factory setting 0

Alert key

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

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

User entry 0 to 0xFF

Factory setting 0

Target mode

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

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

User interface
- Auto
- Out of service

Mode block act

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

Description Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→ 109).

User interface
- Auto
- Out of service

Additional information *Description*

A comparison of the current mode with the target mode (**Target mode** parameter (→ 109)) indicates whether it was possible to reach the target mode.

Mode block perm

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

Description Displays the Mode block perm: This defines which modes of operation in the Target mode (→ 109) are available for the function block. The operating modes that are supported vary depending on the type and function of the block.

User interface 0 to 255

Mode blk norm

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

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

User interface
- Auto
- Out of service

Alarm summary

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

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

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

Additional information

Description

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

User interface

- Discrete alarm
  Alarm or warning message with a discrete value.
- Alm statHiHi lim
  Upper alarm limit
- Alrm stat Hi lim
  Upper warning limit
- Alm statLoLo lim
  Lower alarm limit
- Alrm stat Lo lim
  Lower warning limit
- Update Event
  This option constitutes a special alarm that is triggered if a static parameter is changed. If such a parameter is modified, the associated bit is set in the **Alarm summary** parameter (→ 110), the output of the block switches to "GOOD (NC) Active Update Event" (if the current status has a lower priority than this), and the block remains in this state for a duration of 10 s. The block then reverts to the normal state (the output has the last status and the **Update Event** option bit in the **Alarm summary** parameter (→ 110) is deleted again).

Software rev.

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

Description Displays the firmware version of the measuring device.

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

Hardware rev.

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

Description Displays the hardware revision of the measuring device.

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

Manufacturer ID

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

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

User interface 0 to FFFF

Factory setting 0x11

Device ID

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

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

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

Factory setting Promass 200

Serial number

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

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

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

Additional information *Description*

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

Diagnostics

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

Description Displays the diagnostic messages.

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

Diagnostics mask

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

Description Displays the diagnostic messages supported by the measuring device.

User interface

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

Dev certificate

Navigation Expert → Communication → Physical block → Dev certificate (1486)

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

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

Factory reset

Navigation Expert → Communication → Physical block → Factory reset (1488)

Description Use this function to reset a certain set of parameters in a block.

Selection

- to defaults
- warmstart device
- reset bus addr
- Cancel

Factory setting Cancel

Descriptor

Navigation Expert → Communication → Physical block → Descriptor (1489)

Description Use this function to enter a user-specific string to describe the device within the application.

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

Device message

Navigation Expert → Communication → Physical block → Device message (1490)

Description Use this funtion to enter a user-definable message (a string) to describe the device within the application or in the plant.

User entry Max. 32 Zeichen wie Buchstaben, Zahlen oder Sonderzeichen (z.B. @, %, /).

Device inst.date

Navigation Expert → Communication → Physical block → Device inst.date (1491)

Description Use this function to enter the date of installation of the device.

User entry Max. 16 Zeichen wie Buchstaben, Zahlen oder Sonderzeichen (z.B. @, %, /).

Ident num select

Navigation Expert → Communication → Physical block → Ident num select (1461)

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

Selection
- Automatic mode
- Promass 200
- 3AI,1Tot(0x9742)
- 2AI,1Tot(0x9741)
- 1AI,1Tot(0x9740)

Factory setting Automatic mode

Additional information *Description*

In order to integrate the field devices into the bus system, the PROFIBUS system needs a description of the device parameters, such as output data, input data, data format, data volume and supported transmission rate. These data are available in the device master file

(GSD) which is provided to the PROFIBUS Master when the communication system is commissioned.

Hardware lock

Navigation Expert → Communication → Physical block → Hardware lock (1499)

Description Displays the hardware write protection.

User interface
- Unprotected
- Protected

Additional information

Description

Indicates whether it is possible to write-access the measuring device via PROFIBUS (acyclic data transmission, e.g. via the “FieldCare” operating program).

For detailed information on hardware write protection, see the "Write protection via write protection switch" section of the Operating Instructions.

User interface
- Unprotected
  Write access via PROFIBUS is possible (acyclic data transmission).
- Protected
  Write access via PROFIBUS is locked (acyclic data transmission).

Feature support

Navigation Expert → Communication → Physical block → Feature support (1477)

Description Displays the PROFIBUS features that are supported by the measuring device.

User interface
- Condensed status
- Classic diag
- Data ex.broad.
- MS1 app.relation
- PROFIsafe comm.

Feature enabled

Navigation Expert → Communication → Physical block → Feature enabled (1476)

Description Displays the PROFIBUS features that are enabled in the measuring device.

User interface
- Condensed status
- Classic diag
- Data ex.broad.
- MS1 app.relation
- PROFIsafe comm.

Condensed status

Navigation Expert → Communication → Physical block → Condensed status (1500)

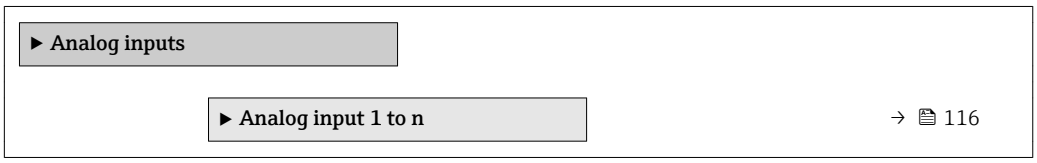
Description Use this function to switch the condensed status diagnostic on and off.

Selection
- Off
- On

Factory setting On

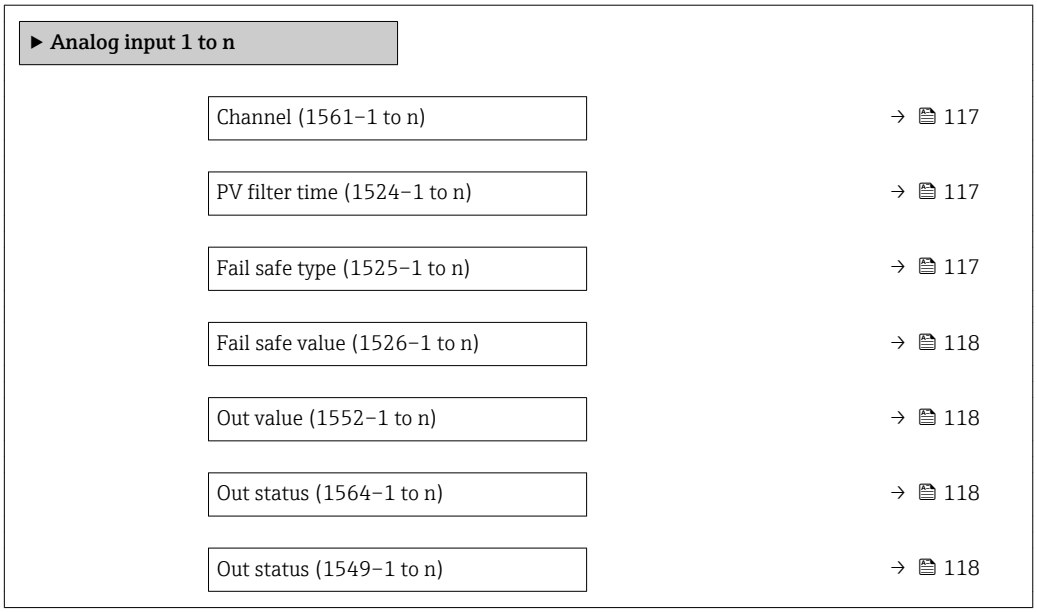
3.5 "Analog inputs" submenu

Navigation Expert → Analog inputs



3.5.1 "Analog input 1 to n" submenu

Navigation Expert → Analog inputs → Analog input 1 to n



Channel

Navigation Expert → Analog inputs → Analog input 1 to n → Channel (1561–1 to n)

Description For selecting the process variable.

Selection
- Mass flow
- Volume flow
- Correct.vol.flow
- Density
- Ref.density
- Temperature

Factory setting Mass flow

PV filter time

Navigation Expert → Analog inputs → Analog input 1 to n → PV filter time (1524–1 to n)

Description Use this function to enter a time to suppress signal peaks. During the specified time the Analog input does not respond to an erratic increase in the process variable.

User entry Positive floating-point number

Factory setting 0

Fail safe type

Navigation Expert → Analog inputs → Analog input 1 to n → Fail safe type (1525–1 to n)

Description Use this function to select the failure mode.

Selection
- Fail safe value
- Fallback value
- Off

Factory setting Off

Additional information *Selection*

If an input or simulation value has the status BAD, the function block uses this predefined failure value:
- Fail safe value
  A substitute value is used. This is specified in the **Fail safe value** parameter (→ 118).
- Fallback value
  If the value was good at one point, then this last valid value is used.
- Off
  The system continues to use the bad value.

Fail safe value

Navigation Expert → Analog inputs → Analog input 1 to n → Fail safe value (1526–1 to n)

Prerequisite In **Fail safe type** parameter (→ 117), the **Fail safe value** option is selected.

Description Use this function to enter a failure value. The value entered is displayed as the output value (**Out value** parameter (→ 118)) in the event of an error.

User entry Signed floating-point number

Factory setting 0

Out value

Navigation Expert → Analog inputs → Analog input 1 to n → Out value (1552–1 to n)

Prerequisite In **Target mode** parameter (→ 120), the **Auto** option is selected.

Description Displays the analog value which is calculated when the function is executed.

User interface Signed floating-point number

Out status

Navigation Expert → Analog inputs → Analog input 1 to n → Out status (1564–1 to n)

Description Displays the current output status (Good, Bad, Uncertain).

User interface
- Good
- Uncertain
- Bad

Out status

Navigation Expert → Analog inputs → Analog input 1 to n → Out status (1549–1 to n)

Prerequisite In **Target mode** parameter (→ 120), the **Auto** option is selected.

Description Displays the current output status (hex value).

User interface 0 to 0xFF

Tag description

Navigation Expert → Analog inputs → Analog input 1 to n → Tag description (1562–1 to n)

Description Use this function to enter a string to identify the block.

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

Static revision

Navigation Expert → Analog inputs → Analog input 1 to n → Static revision (1560–1 to n)

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

User interface 0 to FFFF

Additional information *Description*

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

Strategy

Navigation Expert → Analog inputs → Analog input 1 to n → Strategy (1559–1 to n)

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

User entry 0 to FFFF

Factory setting 0

Alert key

Navigation Expert → Analog inputs → Analog input 1 to n → Alert key (1522–1 to n)

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

User entry 0 to 0xFF

Factory setting 0

Target mode

Navigation Expert → Analog inputs → Analog input 1 to n → Target mode (1563–1 to n)

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

User interface
- Auto
- Man
- Out of service

Mode block act

Navigation Expert → Analog inputs → Analog input 1 to n → Mode block act (1521–1 to n)

Description Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→ 120).

User interface
- Auto
- Man
- Out of service

Additional information *Description*

A comparison of the current mode with the target mode (**Target mode** parameter (→ 120)) indicates whether it was possible to reach the target mode.

Mode block perm

Navigation Expert → Analog inputs → Analog input 1 to n → Mode block perm (1553–1 to n)

Description Displays the Mode block perm: This defines which modes of operation in the Target mode (→ 120) are available for the function block. The operating modes that are supported vary depending on the type and function of the block.

User interface 0 to 255

Mode blk norm

Navigation Expert → Analog inputs → Analog input 1 to n → Mode blk norm (1546–1 to n)

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

User interface
- Auto
- Man
- Out of service

Alarm summary

Navigation Expert → Analog inputs → Analog input 1 to n → Alarm summary (1537–1 to n)

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

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

Additional information *Description*

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

Batch ID

Navigation Expert → Analog inputs → Analog input 1 to n → Batch ID (1533–1 to n)

Description Use this function to enter the batch ID: identification of a specific batch to make it possible to assign device-specific information (e.g. errors, alarm conditions etc.) to the batching process.

User entry Positive integer

Batch operation

Navigation Expert → Analog inputs → Analog input 1 to n → Batch operation (1534–1 to n)

Description Use this function to enter the batch operation: control recipe operation number to identify the active control recipe operation.

User entry 0 to 65 535

Factory setting 0

Batch phase

Navigation Expert → Analog inputs → Analog input 1 to n → Batch phase (1535–1 to n)

Description Use this function to enter the batch phase: control recipe phase number to identify the active control recipe operation.

User entry 0 to 65 535

Factory setting 0

Batch Recipe

Navigation Expert → Analog inputs → Analog input 1 to n → Batch Recipe (1536–1 to n)

Description Use this function to enter the batch recipe unit procedure (RUP): identification of the active control recipe unit procedure or the associated unit (e.g. inductor, centrifuge, drying agent).

User entry 0 to 65 535

Factory setting 0

Additional information *Description*

The unit is defined in IEC61512 Part1/ISA S88 but its meaning is different to that of the parameter unit, such as system units.

PVscale lo range

Navigation Expert → Analog inputs → Analog input 1 to n → PVscale lo range (1554–1 to n)

Description Use this function to enter the lower value range for the input value (Process Value Scale) in system units. The process value scale normalizes the input value to a user-specific range.

User entry Signed floating-point number

Factory setting 0

PVscale up range

Navigation Expert → Analog inputs → Analog input 1 to n → PVscale up range (1555–1 to n)

Description Use this function to enter the upper value range for the input value (Process Value Scale) in system units. The process value scale normalizes the input value to a user-specific range.

User entry Signed floating-point number

Factory setting 100.0

Out scale low

Navigation Expert → Analog inputs → Analog input 1 to n → Out scale low (1548–1 to n)

Description Use this function to enter the lower value range for the output value in system units.

User entry Signed floating-point number

Factory setting 0

Out scale up

Navigation Expert → Analog inputs → Analog input 1 to n → Out scale up (1551–1 to n)

Description Use this function to enter the upper value range for the output value in system units.

User entry Signed floating-point number

Factory setting 100.0

Lin type

Navigation Expert → Analog inputs → Analog input 1 to n → Lin type (1523–1 to n)

Description Use this function to switch off the linearization type for the input value.

Selection Off

Factory setting Off

Out unit

Navigation Expert → Analog inputs → Analog input 1 to n → Out unit (1550–1 to n)

Description Use this function to enter a numerical code (hex) for the system unit.

User entry 0 to 65 535

Factory setting 1 997

Out dec_ point

Navigation Expert → Analog inputs → Analog input 1 to n → Out dec_ point (1547–1 to n)

Description Use this function to enter the maximum number of decimal places that are displayed for the output value.

User entry 0 to 7

Factory setting 0

Alarm hysteresis

Navigation Expert → Analog inputs → Analog input 1 to n → Alarm hysteresis (1527–1 to n)

Description Use this function to enter the hysteresis value for the upper and lower warning or alarm limit values.

User entry Signed floating-point number

Factory setting 0

Hi Hi Lim

Navigation Expert → Analog inputs → Analog input 1 to n → Hi Hi Lim (1528–1 to n)

Description Use this function to enter the value for the upper alarm limit (**HiHi alarm value** parameter (→ 126)).

User entry Signed floating-point number

Factory setting Positive floating-point number

Additional information *Description*

If the output value Out value (→ 118) exceeds this limit value, the **HiHi alarm state** parameter (→ 126) is output.

User entry

The value is entered in the defined units (**Out unit** parameter (→ 124)) and must be in the range defined in the **Out scale low** parameter (→ 123) and **Out scale up** parameter (→ 123).

Hi Lim

Navigation Expert → Analog inputs → Analog input 1 to n → Hi Lim (1529–1 to n)

Description Use this function to enter the value for the upper warning limit (**Hi alarm value** parameter (→ 127)).

User entry Signed floating-point number

Factory setting Positive floating-point number

Additional information *Description*

If the output value Out value (→ 118) exceeds this limit value, the **Hi alarm state** parameter (→ 127) is output.

User entry

The value is entered in the defined units (**Out unit** parameter (→ 124)) and must be in the range defined in the **Out scale low** parameter (→ 123) and **Out scale up** parameter (→ 123).

Lo Lim

Navigation Expert → Analog inputs → Analog input 1 to n → Lo Lim (1530–1 to n)

Description Use this function to enter the value for the lower warning limit (**Lo alarm value** parameter (→ 127)).

User entry Signed floating-point number

Factory setting Negative floating-point number

Additional information *Description*

If the output value Out value (→ 118) exceeds this limit value, the **Lo alarm state** parameter (→ 127) is output.

User entry

The value is entered in the defined units (**Out unit** parameter (→ 124)) and must be in the range defined in the **Out scale low** parameter (→ 123) and **Out scale up** parameter (→ 123).

Lo Lo Lim

Navigation Expert → Analog inputs → Analog input 1 to n → Lo Lo Lim (1531–1 to n)

Description Use this function to enter the value for the lower alarm limit (**LoLo alarm value** parameter (→ 128)).

User entry Signed floating-point number

Factory setting Negative floating-point number

Additional information

Description

If the output value Out value (→ 118) exceeds this limit value, the **LoLo alarm state** parameter (→ 128) is output.

User entry

The value is entered in the defined units (**Out unit** parameter (→ 124)) and must be in the range defined in the **Out scale low** parameter (→ 123) and **Out scale up** parameter (→ 123).

HiHi alarm value

Navigation Expert → Analog inputs → Analog input 1 to n → HiHi alarm value (1541–1 to n)

Description Displays the alarm value for the upper alarm limit value (**Hi Hi Lim** parameter (→ 124)).

User interface Signed floating-point number

HiHi alarm state

Navigation Expert → Analog inputs → Analog input 1 to n → HiHi alarm state (1540–1 to n)

Description Displays the status for the upper alarm limit value (**Hi Hi Lim** parameter (→ 124)).

User interface

- No alarm
- Alm statHiHi lim

Additional information

User interface

The display contains information such as the time of the alarm (date and time) and the value that triggered the alarm.

Hi alarm value

Navigation Expert → Analog inputs → Analog input 1 to n → Hi alarm value (1539–1 to n)

Description Displays the alarm value for the upper warning limit value (**Hi Lim** parameter (→ 125)).

User interface Signed floating-point number

Hi alarm state

Navigation Expert → Analog inputs → Analog input 1 to n → Hi alarm state (1538–1 to n)

Description Displays the status for the upper warning limit value (**Hi Lim** parameter (→ 125)).

User interface
- No warning
- Alrm stat Hi lim

Additional information *User interface*

The display contains information such as the time of the warning (date and time) and the value that triggered the alarm.

Lo alarm value

Navigation Expert → Analog inputs → Analog input 1 to n → Lo alarm value (1543–1 to n)

Description Displays the alarm value for the lower warning limit value (**Lo Lim** parameter (→ 125)).

User interface Signed floating-point number

Lo alarm state

Navigation Expert → Analog inputs → Analog input 1 to n → Lo alarm state (1542–1 to n)

Description Displays the status for the lower warning limit value (**Lo Lim** parameter (→ 125)).

User interface
- No warning
- Alrm stat Lo lim

Additional information *User interface*

The display contains information such as the time of the warning (date and time) and the value that triggered the alarm.

LoLo alarm value

Navigation Expert → Analog inputs → Analog input 1 to n → LoLo alarm value (1545–1 to n)

Description Displays the alarm value for the lower alarm limit value (**Lo Lo Lim** parameter (→ 126)).

User interface Signed floating-point number

LoLo alarm state

Navigation Expert → Analog inputs → Analog input 1 to n → LoLo alarm state (1544–1 to n)

Description Displays the status for the lower alarm limit value (**Lo Lo Lim** parameter (→ 126)).

User interface
- No alarm
- Alm statLoLo lim

Additional information *User interface*

The display contains information such as the time of the alarm (date and time) and the value that triggered the alarm.

Simulate enabled

Navigation Expert → Analog inputs → Analog input 1 to n → Simulate enabled (1556–1 to n)

Description Use this function to enable or disable block simulation.

Selection
- Disable
- Enable

Factory setting Disable

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated discrete I/O channel during operation.

Simulate value

Navigation Expert → Analog inputs → Analog input 1 to n → Simulate value (1558–1 to n)

Description Use this function to enter a simulation value for the block.

User entry Signed floating-point number

Factory setting 0

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated value during operation.

Simulate status

Navigation Expert → Analog inputs → Analog input 1 to n → Simulate status (1557–1 to n)

Description Use this function to enter a simulation status for the block.

User entry 0 to 255

Factory setting 0

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated status during operation.

Out unit text

Navigation Expert → Analog inputs → Analog input 1 to n → Out unit text (1532–1 to n)

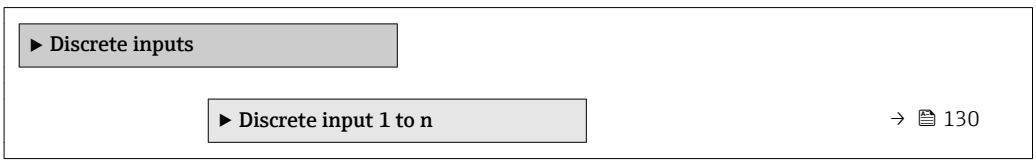
Description Use this function to enter the out unit text: if a specific out unit does not appear in the code list, the user can enter the specific text. The unit code is then equivalent to the definition provided here.

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

Factory setting NoUnit

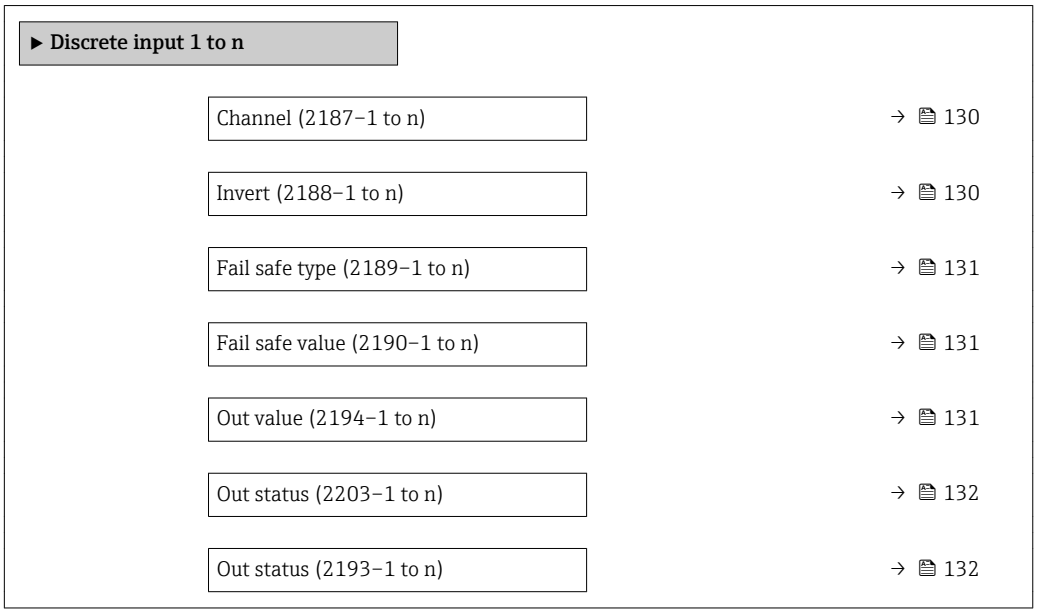
3.6 "Discrete inputs" submenu

Navigation Expert → Discrete inputs



3.6.1 "Discrete input 1 to n" submenu

Navigation Expert → Discrete inputs → Discrete input 1 to n



Channel

Navigation Expert → Discrete inputs → Discrete input 1 to n → Channel (2187–1 to n)

Description Use this function to assign a measured variable to the particular function block.

Selection
- Empty pipe det.
- Low flow cut off
- Switch out.stat.
- Verific. status *

Factory setting Switch out.stat.

Invert

Navigation Expert → Discrete inputs → Discrete input 1 to n → Invert (2188–1 to n)

Description Use this function to invert the input signal.

Selection
- Off
- On

Factory setting Off

* Visibility depends on order options or device settings

Fail safe type

Navigation Expert → Discrete inputs → Discrete input 1 to n → Fail safe type (2189–1 to n)

Description Use this function to select the failure mode.

Selection
- Fail safe value
- Fallback value
- Off

Factory setting Off

Additional information *Selection*

If an input or simulation value has the status BAD, the function block uses this predefined failure value:
- Fail safe value
  A substitute value is used. This is specified in the **Fail safe value** parameter (→ 131).
- Fallback value
  If the value was good at one point, then this last valid value is used.
- Off
  The system continues to use the bad value.

Fail safe value

Navigation Expert → Discrete inputs → Discrete input 1 to n → Fail safe value (2190–1 to n)

Prerequisite In **Fail safe type** parameter (→ 131), the **Fail safe value** option is selected.

Description Use this function to enter a failure value. The value entered is displayed as the output value (**Out value** parameter (→ 131)) in the event of an error.

User entry 0 to 255

Factory setting 0

Out value

Navigation Expert → Discrete inputs → Discrete input 1 to n → Out value (2194–1 to n)

Prerequisite In **Target mode** parameter (→ 133), the **Auto** option is selected.

Description Displays the analog value which is calculated when the function is executed.

User interface 0 to 255

Out status

Navigation Expert → Discrete inputs → Discrete input 1 to n → Out status (2203–1 to n)

Description Displays the current output status (Good, Bad, Uncertain).

User interface
- Good
- Uncertain
- Bad

Out status

Navigation Expert → Discrete inputs → Discrete input 1 to n → Out status (2193–1 to n)

Prerequisite In **Target mode** parameter (→ 133), the **Auto** option is selected.

Description Displays the current output status (hex value).

User interface 0 to 0xFF

Tag description

Navigation Expert → Discrete inputs → Discrete input 1 to n → Tag description (2201–1 to n)

Description Use this function to enter a string to identify the block.

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

Static revision

Navigation Expert → Discrete inputs → Discrete input 1 to n → Static revision (2200–1 to n)

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

User interface 0 to FFFF

Additional information *Description*

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

Strategy

Navigation Expert → Discrete inputs → Discrete input 1 to n → Strategy (2199–1 to n)

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

User entry 0 to FFFF

Factory setting 0

Alert key

Navigation Expert → Discrete inputs → Discrete input 1 to n → Alert key (2182–1 to n)

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

User entry 0 to 0xFF

Factory setting 0

Target mode

Navigation Expert → Discrete inputs → Discrete input 1 to n → Target mode (2202–1 to n)

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

User interface
- Auto
- Man
- Out of service

Mode block act

Navigation Expert → Discrete inputs → Discrete input 1 to n → Mode block act (2181–1 to n)

Description Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→ 133).

User interface
- Auto
- Man
- Out of service

Additional information *Description*

A comparison of the current mode with the target mode (**Target mode** parameter (→ 133)) indicates whether it was possible to reach the target mode.

Mode block perm

Navigation Expert → Discrete inputs → Discrete input 1 to n → Mode block perm (2195–1 to n)

Description Displays the Mode block perm: This defines which modes of operation in the Target mode (→ 133) are available for the function block. The operating modes that are supported vary depending on the type and function of the block.

User interface 0 to 255

Mode blk norm

Navigation Expert → Discrete inputs → Discrete input 1 to n → Mode blk norm (2192–1 to n)

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

User interface
- Auto
- Man
- Out of service

Alarm summary

Navigation Expert → Discrete inputs → Discrete input 1 to n → Alarm summary (2191–1 to n)

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

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

Additional information *Description*

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

Batch ID

Navigation Expert → Discrete inputs → Discrete input 1 to n → Batch ID (2183–1 to n)

Description Use this function to enter the batch ID: identification of a specific batch to make it possible to assign device-specific information (e.g. errors, alarm conditions etc.) to the batching process.

User entry Positive integer

Batch operation

Navigation Expert → Discrete inputs → Discrete input 1 to n → Batch operation (2184–1 to n)

Description Use this function to enter the batch operation: control recipe operation number to identify the active control recipe operation.

User entry 0 to 65 535

Factory setting 0

Batch phase

Navigation Expert → Discrete inputs → Discrete input 1 to n → Batch phase (2185–1 to n)

Description Use this function to enter the batch phase: control recipe phase number to identify the active control recipe operation.

User entry 0 to 65 535

Factory setting 0

Batch Recipe

Navigation Expert → Discrete inputs → Discrete input 1 to n → Batch Recipe (2186–1 to n)

Description Use this function to enter the batch recipe unit procedure (RUP): identification of the active control recipe unit procedure or the associated unit (e.g. inductor, centrifuge, drying agent).

User entry 0 to 65 535

Factory setting 0

Additional information *Description*

The unit is defined in IEC61512 Part1/ISA S88 but its meaning is different to that of the parameter unit, such as system units.

Simulate enabled

Navigation Expert → Discrete inputs → Discrete input 1 to n → Simulate enabled (2196–1 to n)

Description Use this function to enable or disable block simulation.

Selection
- Disable
- Enable

Factory setting Disable

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated discrete I/O channel during operation.

Simulate value

Navigation Expert → Discrete inputs → Discrete input 1 to n → Simulate value (2198–1 to n)

Description Use this function to enter a simulation value for the block.

User entry 0 to 255

Factory setting 0

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated value during operation.

Simulate status

Navigation Expert → Discrete inputs → Discrete input 1 to n → Simulate status (2197–1 to n)

Description Use this function to enter a simulation status for the block.

User entry 0 to 255

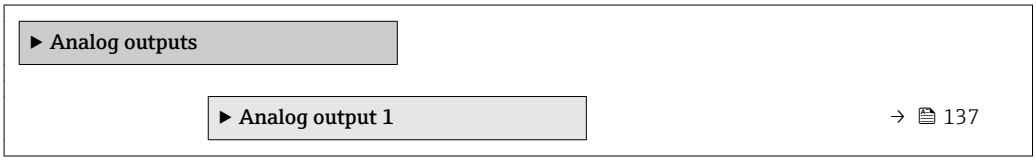
Factory setting 0

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated status during operation.

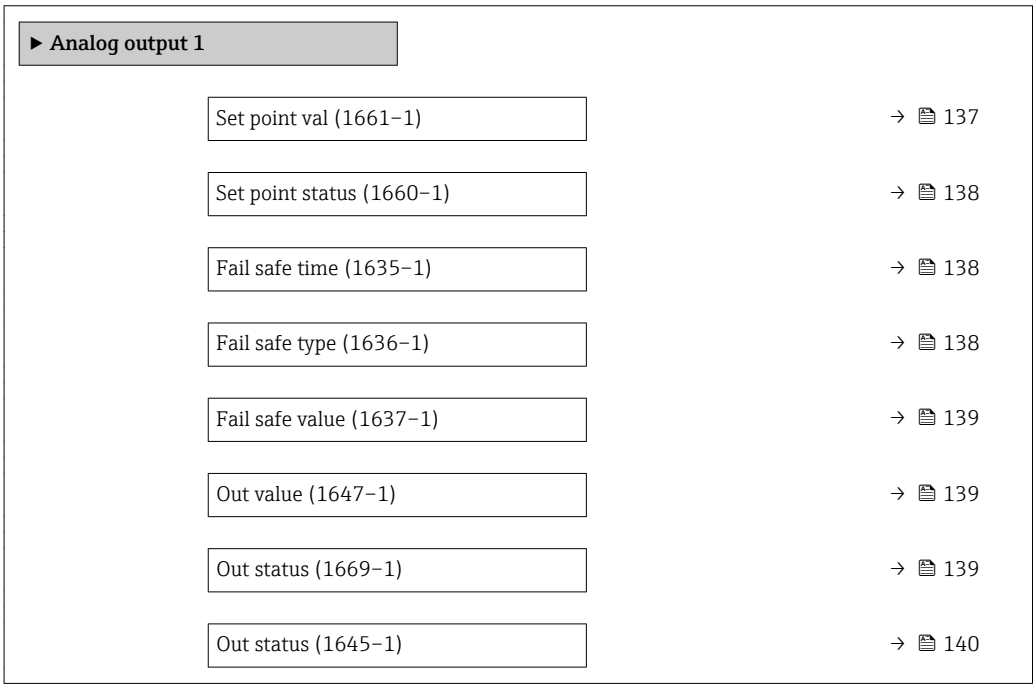
3.7 "Analog outputs" submenu

Navigation Expert → Analog outputs



3.7.1 "Analog output 1 to n" submenu

Navigation Expert → Analog outputs → Analog output 1 to n



Set point val

Navigation Expert → Analog outputs → Analog output 1 → Set point val (1661–1)

Description Use this function to enter an analog set point.

User entry Signed floating-point number

Factory setting 0

Set point status

Navigation Expert → Analog outputs → Analog output 1 → Set point status (1660–1)

Description Use this function to enter a status for the analog set point.

User entry 0 to 255

Factory setting 0

Fail safe time

Navigation Expert → Analog outputs → Analog output 1 → Fail safe time (1635–1)

Description Use this function to enter a time span within which the criteria for an error must be met continuously before an error message or notice message is generated.

User entry 0 to 999.0

Factory setting 0

Additional information *User entry*

NOTE!

If this parameter is used, error messages and notice messages are delayed by the set time before being relayed to the higher-level controller (DCS, etc.).

▸ Check in advance to ensure that the safety-specific requirements of the process would permit this.

▸ If the error and notice messages may not be suppressed, a value of 0 seconds must be configured here.

Fail safe type

Navigation Expert → Analog outputs → Analog output 1 → Fail safe type (1636–1)

Description Use this function to select the failure mode.

Selection
- Fail safe value
- Fallback value
- Off

Factory setting Fallback value

Additional information *Selection*

If an input or simulation value has the status BAD, the function block uses this predefined failure value:
- Fail safe value
  A substitute value is used. This is specified in the **Fail safe value** parameter (→ 139).
- Fallback value
  If the value was good at one point, then this last valid value is used.
- Off
  The system continues to use the bad value.

Fail safe value

Navigation Expert → Analog outputs → Analog output 1 → Fail safe value (1637–1)

Prerequisite In **Fail safe type** parameter (→ 138), the **Fallback value** option is selected.

Description Use this function to enter a failure value. The value entered is displayed as the output value (**Out value** parameter (→ 139)) in the event of an error.

User entry Signed floating-point number

Factory setting 0

Out value

Navigation Expert → Analog outputs → Analog output 1 → Out value (1647–1)

Prerequisite In **Target mode** parameter (→ 141), the **Auto** option is selected.

Description Displays the analog value which is calculated when the function is executed.

User interface Signed floating-point number

Out status

Navigation Expert → Analog outputs → Analog output 1 → Out status (1669–1)

Description Displays the current output status (Good, Bad, Uncertain).

User interface
- Good
- Uncertain
- Bad

Out status

Navigation Expert → Analog outputs → Analog output 1 → Out status (1645–1)

Prerequisite In **Target mode** parameter (→ 141), the **Auto** option is selected.

Description Displays the current output status (hex value).

User interface 0 to 0xFF

Tag description

Navigation Expert → Analog outputs → Analog output 1 → Tag description (1667–1)

Description Use this function to enter a string to identify the block.

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

Static revision

Navigation Expert → Analog outputs → Analog output 1 → Static revision (1666–1)

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

User interface 0 to FFFF

Additional information *Description*

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

Strategy

Navigation Expert → Analog outputs → Analog output 1 → Strategy (1665–1)

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

User entry 0 to FFFF

Factory setting 0

Alert key

Navigation Expert → Analog outputs → Analog output 1 → Alert key (1632–1)

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

User entry 0 to 0xFF

Factory setting 0

Target mode

Navigation Expert → Analog outputs → Analog output 1 → Target mode (1668–1)

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

User interface
- Auto
- Local override
- Man
- Out of service
- Remote Cascaded

Mode block act

Navigation Expert → Analog outputs → Analog output 1 → Mode block act (1631–1)

Description Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→ 141).

User interface
- Auto
- Local override
- Man
- Out of service
- Remote Cascaded

Additional information *Description*

A comparison of the current mode with the target mode (**Target mode** parameter (→ 141)) indicates whether it was possible to reach the target mode.

Mode block perm

Navigation Expert → Analog outputs → Analog output 1 → Mode block perm (1648–1)

Description Displays the Mode block perm: This defines which modes of operation in the Target mode (→ 141) are available for the function block. The operating modes that are supported vary depending on the type and function of the block.

User interface 0 to 255

Mode blk norm

Navigation Expert → Analog outputs → Analog output 1 → Mode blk norm (1643–1)

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

User interface
- Auto
- Local override
- Man
- Out of service
- Remote Cascaded

Alarm summary

Navigation Expert → Analog outputs → Analog output 1 → Alarm summary (1642–1)

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

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

Additional information *Description*

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

Batch ID

Navigation Expert → Analog outputs → Analog output 1 → Batch ID (1633–1)

Description Use this function to enter the batch ID: identification of a specific batch to make it possible to assign device-specific information (e.g. errors, alarm conditions etc.) to the batching process.

User entry Positive integer

Batch operation

Navigation Expert → Analog outputs → Analog output 1 → Batch operation (1639–1)

Description Use this function to enter the batch operation: control recipe operation number to identify the active control recipe operation.

User entry 0 to 65 535

Factory setting 0

Batch phase

Navigation Expert → Analog outputs → Analog output 1 → Batch phase (1640–1)

Description Use this function to enter the batch phase: control recipe phase number to identify the active control recipe operation.

User entry 0 to 65 535

Factory setting 0

Batch Recipe

Navigation Expert → Analog outputs → Analog output 1 → Batch Recipe (1641–1)

Description Use this function to enter the batch recipe unit procedure (RUP): identification of the active control recipe unit procedure or the associated unit (e.g. inductor, centrifuge, drying agent).

User entry 0 to 65 535

Factory setting 0

Additional information *Description*

The unit is defined in IEC61512 Part1/ISA S88 but its meaning is different to that of the parameter unit, such as system units.

PVscale lo range

Navigation Expert → Analog outputs → Analog output 1 → PVscale lo range (1651–1)

Description Use this function to enter the lower value range for the input value (Process Value Scale) in system units. The process value scale normalizes the input value to a user-specific range.

User entry Signed floating-point number

Factory setting 0

PVscale up range

Navigation Expert → Analog outputs → Analog output 1 → PVscale up range (1652–1)

Description Use this function to enter the upper value range for the input value (Process Value Scale) in system units. The process value scale normalizes the input value to a user-specific range.

User entry Signed floating-point number

Factory setting 100.0

Readback value

Navigation Expert → Analog outputs → Analog output 1 → Readback value (1659–1)

Description Displays the readback value. The readback value indicates the current position of the control element within the travel range (between the open and close position) in PV scale units.

User interface Signed floating-point number

Readback status

Navigation Expert → Analog outputs → Analog output 1 → Readback status (1658–1)

Description Displays the readback status. The readback status contains the status information of the slave.

User interface 0 to 255

RCAS in value

Navigation Expert → Analog outputs → Analog output 1 → RCAS in value (1655–1)

Description Use this function to enter the RCAS (Remote Cascade) in value. The block set point is set by a control application via the remote cascade **RCAS in value** parameter (→ 145). The normal algorithm calculates the output value of the block on the basis of this set point.

User entry Signed floating-point number

Factory setting 0

RCAS in status

Navigation Expert → Analog outputs → Analog output 1 → RCAS in status (1654–1)

Description Use this function to enter the RCAS (Remote Cascade) in status. Defines the status for the RCAS in value (→ 145).

User entry 0 to 255

Factory setting 0

Input channel

Navigation Expert → Analog outputs → Analog output 1 → Input channel (1670–1)

Description Use this function to select the input channel. The number of logical hardware channels from the converter that is connected to this I/O block.

Selection None

Factory setting None

Output channel

Navigation Expert → Analog outputs → Analog output 1 → Output channel (1671–1)

Description Use this function to select the output channel. The number of logical hardware channels to the converter that is connected to this I/O block.

Selection External press.

Factory setting External press.

RCAS out value

Navigation Expert → Analog outputs → Analog output 1 → RCAS out value (1657–1)

Description Displays the RCAS out value. Displays the set point of the block which is made available to the higher-level host for monitoring/back calculation and which makes it possible to take action under certain conditions or in a different mode.

User interface Signed floating-point number

RCAS out status

Navigation Expert → Analog outputs → Analog output 1 → RCAS out status (1656–1)

Description Displays the RCAS out status. Displays the status of the set point.

User interface 0 to 0xFF

Pos value

Navigation Expert → Analog outputs → Analog output 1 → Pos value (1650–1)

Description Displays the current value of the positioner.

User interface 0 to 255

Position status

Navigation Expert → Analog outputs → Analog output 1 → Position status (1649–1)

Description Displays the current status of the positioner.

User interface 0 to 255

Setp. deviation

Navigation Expert → Analog outputs → Analog output 1 → Setp. deviation (1653–1)

Description Displays the deviation between the set point (**Set point val** parameter (→ 137)) and the actual value (**Readback value** parameter (→ 144)).

User interface Signed floating-point number

Simulate enabled

Navigation Expert → Analog outputs → Analog output 1 → Simulate enabled (1662–1)

Description Use this function to enable or disable block simulation.

Selection
- Disable
- Enable

Factory setting Disable

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated discrete I/O channel during operation.

Simulate value

Navigation Expert → Analog outputs → Analog output 1 → Simulate value (1664–1)

Description Use this function to enter a simulation value.

User entry Signed floating-point number

Factory setting 0

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated value during operation.

Simulate status

Navigation Expert → Analog outputs → Analog output 1 → Simulate status (1663–1)

Description Use this function to enter a simulation status for the block.

User entry 0 to 255

Factory setting 0

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated status during operation.

Increase close

Navigation Expert → Analog outputs → Analog output 1 → Increase close (1638–1)

Description Use this function to enter the effective direction of the positioner in automatic mode.

User entry 0 to 255

Factory setting 0

Out scale up

Navigation Expert → Analog outputs → Analog output 1 → Out scale up (1646–1)

Description Use this function to enter the upper value range for the output value in system units.

User entry Signed floating-point number

Factory setting 100.0

Out scale low

Navigation Expert → Analog outputs → Analog output 1 → Out scale low (1644–1)

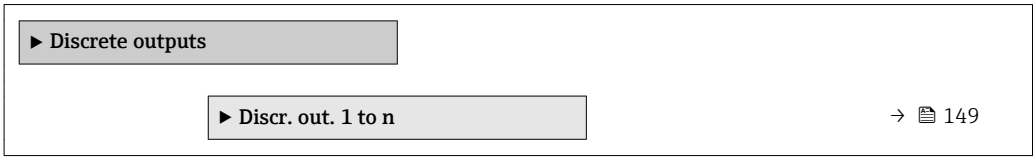
Description Use this function to enter the lower value range for the output value in system units.

User entry Signed floating-point number

Factory setting 0

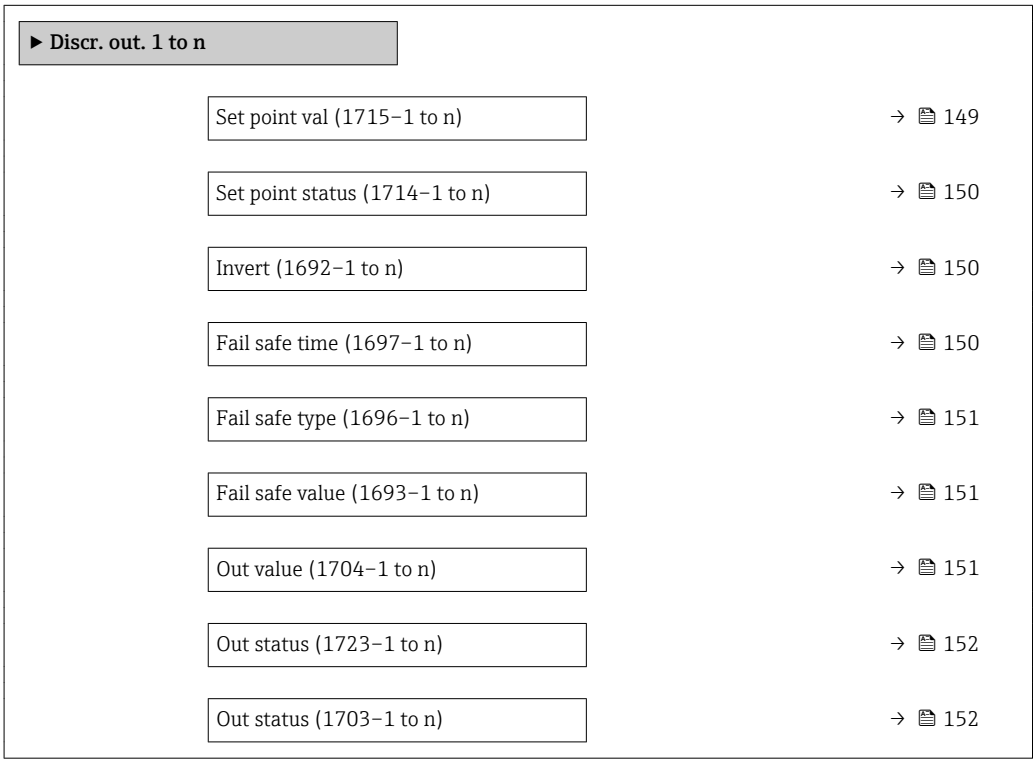
3.8 "Discrete outputs" submenu

Navigation Expert → Discrete outputs



3.8.1 "Discrete output 1 to n" submenu

Navigation Expert → Discrete outputs → Discr. out. 1 to n



Set point val

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Set point val (1715–1 to n)

Description Use this function to enter an analog set point.

User entry 0 to 255

Factory setting 0

Set point status

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Set point status (1714–1 to n)

Description Use this function to enter a status for the analog set point.

User entry 0 to 255

Factory setting 0

Invert

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Invert (1692–1 to n)

Description Use this function to switch inversion on and off. Specifies whether the set point should be inverted before the value is set as the output value or the RCAS value (in the automatic mode).

Selection
- Off
- On

Factory setting Off

Fail safe time

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Fail safe time (1697–1 to n)

Description Use this function to enter a time span within which the criteria for an error must be met continuously before an error message or notice message is generated.

User entry Signed floating-point number

Factory setting 0

Additional information *User entry*

NOTE!

If this parameter is used, error messages and notice messages are delayed by the set time before being relayed to the higher-level controller (DCS, etc.).

▸ Check in advance to ensure that the safety-specific requirements of the process would permit this.

▸ If the error and notice messages may not be suppressed, a value of 0 seconds must be configured here.

Fail safe type

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Fail safe type (1696–1 to n)

Description Use this function to select the failure mode.

Selection
- Fail safe value
- Fallback value
- Off

Factory setting Fallback value

Additional information *Selection*

If an input or simulation value has the status BAD, the function block uses this predefined failure value:
- Fail safe value
  A substitute value is used. This is specified in the **Fail safe value** parameter (→ 151).
- Fallback value
  If the value was good at one point, then this last valid value is used.
- Off
  The system continues to use the bad value.

Fail safe value

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Fail safe value (1693–1 to n)

Prerequisite In **Fail safe type** parameter (→ 151), the **Fail safe value** option is selected.

Description Use this function to enter a failure value. The value entered is displayed as the output value (**Out value** parameter (→ 151)) in the event of an error.

User entry 0 to 255

Factory setting 0

Out value

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Out value (1704–1 to n)

Prerequisite In **Target mode** parameter (→ 153), the **Auto** option is selected.

Description Displays the analog value which is calculated when the function is executed.

User interface 0 to 255

Out status

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Out status (1723–1 to n)

Description Displays the current output status (Good, Bad, Uncertain).

User interface
- Good
- Uncertain
- Bad

Out status

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Out status (1703–1 to n)

Prerequisite In **Target mode** parameter (→ 153), the **Auto** option is selected.

Description Displays the current output status (hex value).

User interface 0 to 0xFF

Tag description

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Tag description (1721–1 to n)

Description Use this function to enter a string to identify the block.

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

Static revision

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Static revision (1720–1 to n)

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

User interface 0 to FFFF

Additional information *Description*

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

Strategy

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Strategy (1719–1 to n)

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

User entry 0 to FFFF

Factory setting 0

Alert key

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Alert key (1694–1 to n)

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

User entry 0 to 0xFF

Factory setting 0

Target mode

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Target mode (1722–1 to n)

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

User interface
- Local override
- Remote Cascaded
- Man
- Out of service
- Auto

Mode block act

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Mode block act (1691–1 to n)

Description Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→ 153).

User interface
- Local override
- Remote Cascaded
- Man
- Out of service
- Auto

Additional information *Description*

A comparison of the current mode with the target mode (**Target mode** parameter (→ 153)) indicates whether it was possible to reach the target mode.

Mode block perm

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Mode block perm (1705–1 to n)

Description Displays the Mode block perm: This defines which modes of operation in the Target mode (→ 153) are available for the function block. The operating modes that are supported vary depending on the type and function of the block.

User interface 0 to 255

Mode blk norm

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Mode blk norm (1702–1 to n)

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

User interface
- Local override
- Remote Cascaded
- Man
- Out of service
- Auto

Alarm summary

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Alarm summary (1701–1 to n)

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

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

Additional information *Description*

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

Batch ID

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Batch ID (1695–1 to n)

Description Use this function to enter the batch ID: identification of a specific batch to make it possible to assign device-specific information (e.g. errors, alarm conditions etc.) to the batching process.

User entry Positive integer

Batch operation

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Batch operation (1698–1 to n)

Description Use this function to enter the batch operation: control recipe operation number to identify the active control recipe operation.

User entry 0 to 65 535

Factory setting 0

Batch phase

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Batch phase (1699–1 to n)

Description Use this function to enter the batch phase: control recipe phase number to identify the active control recipe operation.

User entry 0 to 65 535

Factory setting 0

Batch Recipe

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Batch Recipe (1700–1 to n)

Description Use this function to enter the batch recipe unit procedure (RUP): identification of the active control recipe unit procedure or the associated unit (e.g. inductor, centrifuge, drying agent).

User entry 0 to 65 535

Factory setting 0

Additional information *Description*

The unit is defined in IEC61512 Part1/ISA S88 but its meaning is different to that of the parameter unit, such as system units.

Readback value

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Readback value (1713–1 to n)

Description Displays the readback value. The readback value indicates the current position of the control element and the element's sensors.

User interface 0 to 255

Readback status

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Readback status (1712–1 to n)

Description Displays the readback status. Displays the status of the readback value.

User interface 0 to 255

RCAS in value

Navigation Expert → Discrete outputs → Discr. out. 1 to n → RCAS in value (1707–1 to n)

Description Use this function to enter the RCAS (Remote Cascade) in value. The block set point is set by a control application via the remote cascade **RCAS in value** parameter (→ 156). The normal algorithm calculates the output value of the block on the basis of this set point.

User entry 0 to 255

Factory setting 0

RCAS in status

Navigation Expert → Discrete outputs → Discr. out. 1 to n → RCAS in status (1706–1 to n)

Description Use this function to enter the RCAS (Remote Cascade) in status. Defines the status for the RCAS in value (→ 156).

User entry 0 to 255

Factory setting 0

Input channel

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Input channel (1724–1 to n)

Description Use this function to select the input channel. The number of logical hardware channels from the converter that is connected to this I/O block.

Selection None

Factory setting None

Output channel

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Output channel (1725–1 to n)

Description Use this function to select the output channel. The number of logical hardware channels to the converter that is connected to this I/O block.

Selection
- Flow override
- Zero point adj.
- PFS output *
- Start verificat. *

Factory setting Flow override

RCAS out value

Navigation Expert → Discrete outputs → Discr. out. 1 to n → RCAS out value (1711–1 to n)

Description Displays the RCAS out value. Displays the set point of the block which is made available to the higher-level host for monitoring/back calculation and which makes it possible to take action under certain conditions or in a different mode.

* Visibility depends on order options or device settings

User interface 0 to 255

RCAS out status

Navigation Expert → Discrete outputs → Discr. out. 1 to n → RCAS out status (1708–1 to n)

Description Displays the RCAS out status. Displays the status of the set point.

User interface 0 to 255

Simulate enabled

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Simulate enabled (1716–1 to n)

Description Use this function to enable or disable block simulation.

Selection
- Disable
- Enable

Factory setting Disable

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated discrete I/O channel during operation.

Simulate value

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Simulate value (1718–1 to n)

Description Use this function to enter a simulation value.

User entry 0 to 255

Factory setting 0

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated value during operation.

Simulate status	

Navigation Expert → Discrete outputs → Discr. out. 1 to n → Simulate status (1717–1 to n)

Description Use this function to enter a simulation status for the block.

User entry 0 to 255

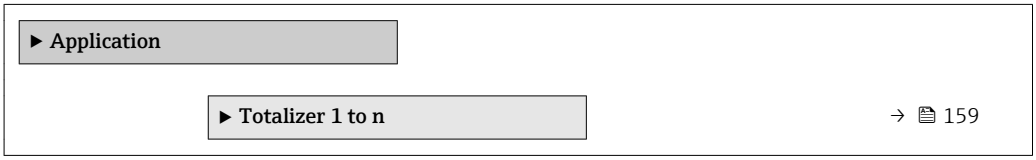
Factory setting 0

Additional information *Description*

The simulation is used to bypass the physical I/O channel. In this way, the block remains in the normal mode and uses the simulated status during operation.

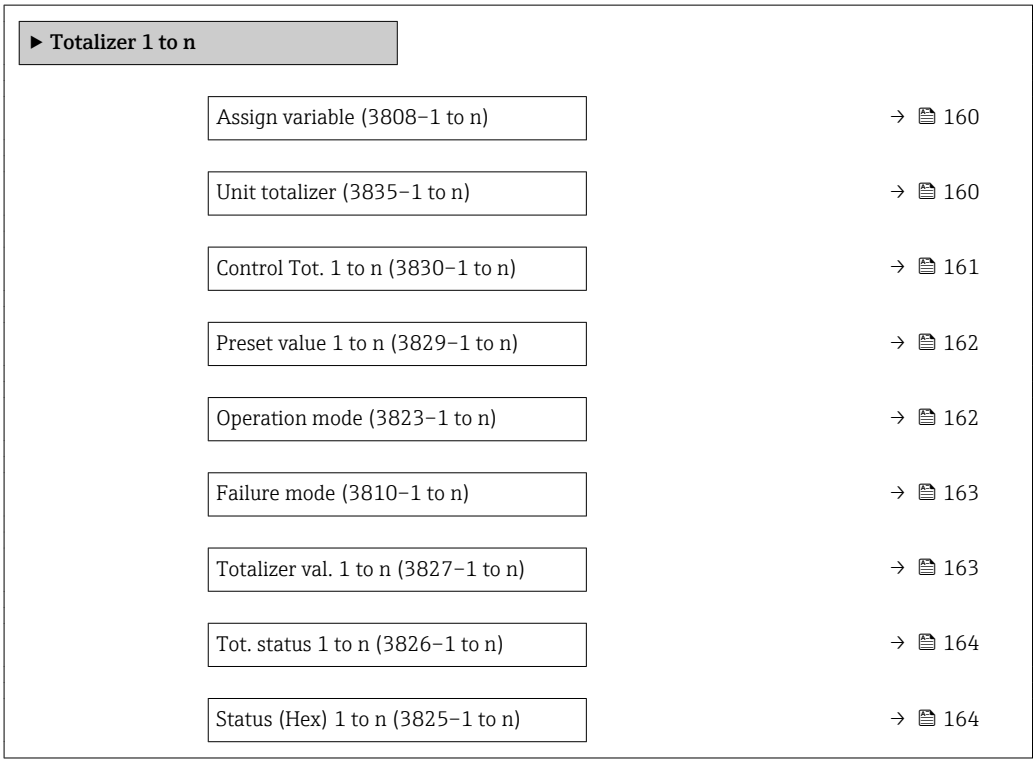
3.9 "Application" submenu

Navigation Expert → Application



3.9.1 "Totalizer 1 to n" submenu

Navigation Expert → Application → Totalizer 1 to n



Assign variable

Navigation Expert → Application → Totalizer 1 to n → Assign variable (3808–1 to n)

Description Use this function to select a process variable for the Totalizer 1 to n.

Selection
- Mass flow
- Volume flow
- Correct.vol.flow

Factory setting Mass flow

Additional information *Description*

If the option selected is changed, the device resets the totalizer to 0.

Unit totalizer

Navigation Expert → Application → Totalizer 1 to n → Unit totalizer (3835–1 to n)

Prerequisite One of the following options is selected in the **Assign variable** parameter (→ 160):
- Mass flow
- Volume flow
- Correct.vol.flow

Description Use this function to select the process variable of a totalizer.

The unit is selected separately for each totalizer. It is independent of the selection made in the **System units** submenu (→ 51).

Selection

SI units
- g
- kg
- t

US units
- oz
- lb
- STon

or

SI units
- cm^3
- dm^3
- m^3
- ml
- l
- hl
- Ml Mega

US units
- af
- ft^3
- fl oz (us)
- gal (us)
- kgal (us)
- Mgal (us)
- bbl (us;liq.)
- bbl (us;beer)
- bbl (us;oil)
- bbl (us;tank)

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

or

SI units	*US units*	*Imperial units*
▪ Nl ▪ Nm^3 ▪ Sl ▪ Sm^3	▪ Sft^3 ▪ Sgal (us) ▪ Sbbl (us;liq.)	Sgal (imp)

Factory setting

Country-specific:
- kg
- lb

Additional information

Selection

The selection is independent of the process variable selected in the **Assign variable** parameter (→ 160).

Dependency

The following parameters depend on the option selected:
- **Alarm hysteresis** parameter (→ 168)
- **Hi Hi Lim** parameter (→ 168)
- **Hi Lim** parameter (→ 169)
- **Lo Lim** parameter (→ 169)
- **Lo Lo Lim** parameter (→ 170)
- **Totalizer val.** parameter (→ 48)
- **Preset value** parameter (→ 162)

Control Tot. 1 to n

Navigation

Expert → Application → Totalizer 1 to n → Control Tot. 1 to n (3830–1 to n)

Prerequisite

In the **Assign variable** parameter (→ 160), one of the following options is selected:
- Mass flow
- Volume flow
- Correct.vol.flow

Description

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

Selection

- Totalize
- Reset + hold
- Preset + hold

Factory setting

Totalize

Additional information

Selection

- Totalize
  The totalizer is started or continues totalizing with the current counter reading.
- Reset + hold
  The totaling process is stopped and the totalizer is reset to 0.
- Preset + hold
  The totaling process is stopped and the totalizer is set to its defined start value from the **Preset value** parameter.

Preset value 1 to n

Navigation Expert → Application → Totalizer 1 to n → Preset value 1 to n (3829–1 to n)

Prerequisite One of the following options is selected in the **Assign variable** parameter (→ 160):
- Mass flow
- Volume flow
- Correct.vol.flow

Description Use this function to enter an initial value for the specific totalizer.

User entry Signed floating-point number

Factory setting Country-specific:
- kg
- lb

Additional information *User entry*

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 160).

Example

This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.

Operation mode

Navigation Expert → Application → Totalizer 1 to n → Operation mode (3823–1 to n)

Prerequisite In the **Assign variable** parameter (→ 160), one of the following options is selected:
- Mass flow
- Volume flow
- Correct.vol.flow

Description Use this function to select how the totalizer summates the flow.

Selection
- Net flow total
- Forward total
- Reverse total
- Last valid value

Factory setting Net flow total

Additional information *Selection*

- Net flow total
  Positive and negative flow values are totalized and balanced against one another. Net flow is registered in the flow direction.
- Forward total
  Only the flow in the forward flow direction is totalized.
- Reverse total
  Only the flow against the forward flow direction is totalized (= reverse flow total).
- Last valid value
  The value is frozen. Totaling is stopped.

Failure mode

Navigation Expert → Application → Totalizer 1 to n → Failure mode (3810–1 to n)

Prerequisite In the **Assign variable** parameter (→ 160), one of the following options is selected:
- Mass flow
- Volume flow
- Correct.vol.flow

Description Use this function to select how a totalizer behaves in the event of a device alarm.

Selection
- Stop
- Actual value
- Last valid value

Factory setting Actual value

Additional information *Description*

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

Selection

- Stop
  Totalizing is stopped when a device alarm occurs.
- Actual value
  The totalizer continues to count based on the current measured value; the device alarm is ignored.
- Last valid value
  The totalizer continues to count based on the last valid measured value before the device alarm occurred.

Totalizer val. 1 to n

Navigation Expert → Application → Totalizer 1 to n → Totalizer val. 1 to n (3827–1 to n)

Prerequisite In the **Target mode** parameter (→ 165), the **Auto** option is selected.

Description Displays the current reading for totalizer 1-3.

User interface Signed floating-point number

Additional information

Description

In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→ 163).

User interface

The value of the process variable totalized since measuring began can be positive or negative. This depends on the settings in the **Operation mode** parameter (→ 162).

Dependency

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 160).

Tot. status 1 to n

Navigation Expert → Application → Totalizer 1 to n → Tot. status 1 to n (3826–1 to n)

Description Displays the status of the particular totalizer.

User interface
- Good
- Uncertain
- Bad

Status (Hex) 1 to n

Navigation Expert → Application → Totalizer 1 to n → Status (Hex) 1 to n (3825–1 to n)

Prerequisite In **Target mode** parameter (→ 165), the **Auto** option is selected.

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

User interface 0 to 0xFF

Tag description

Navigation Expert → Application → Totalizer 1 to n → Tag description (3833–1 to n)

Description Use this function to enter a string to identify the block.

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

Static revision

Navigation Expert → Application → Totalizer 1 to n → Static revision (3832–1 to n)

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

User interface 0 to FFFF

Additional information *Description*

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

Strategy

Navigation Expert → Application → Totalizer 1 to n → Strategy (3831–1 to n)

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

User entry 0 to FFFF

Factory setting 0

Alert key

Navigation Expert → Application → Totalizer 1 to n → Alert key (3803–1 to n)

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

User entry 0 to 0xFF

Factory setting 0

Target mode

Navigation Expert → Application → Totalizer 1 to n → Target mode (3834–1 to n)

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

User interface

- Auto
- Man
- Out of service

Mode block act

Navigation Expert → Application → Totalizer 1 to n → Mode block act (3801–1 to n)

Description Displays the Mode block act: Under certain conditions, it is possible that a function block will not operate in the required mode. In this case, the Mode block act shows the actual mode in which the function block is currently operating. A comparison of the Mode block act with the Target mode indicates whether it was possible to reach the Target mode (→ 165).

User interface
- Auto
- Man
- Out of service

Additional information *Description*

A comparison of the current mode with the target mode (**Target mode** parameter (→ 165)) indicates whether it was possible to reach the target mode.

Mode block perm

Navigation Expert → Application → Totalizer 1 to n → Mode block perm (3828–1 to n)

Description Displays the Mode block perm: This defines which modes of operation in the Target mode (→ 165) are available for the function block. The operating modes that are supported vary depending on the type and function of the block.

User interface 0 to 255

Mode blk norm

Navigation Expert → Application → Totalizer 1 to n → Mode blk norm (3824–1 to n)

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

User interface
- Auto
- Man
- Out of service

Alarm summary

Navigation Expert → Application → Totalizer 1 to n → Alarm summary (3809–1 to n)

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

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

Additional information *Description*

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

Batch ID

Navigation Expert → Application → Totalizer 1 to n → Batch ID (3804–1 to n)

Description Use this function to enter the batch ID: identification of a specific batch to make it possible to assign device-specific information (e.g. errors, alarm conditions etc.) to the batching process.

User entry Positive integer

Factory setting 0

Batch operation

Navigation Expert → Application → Totalizer 1 to n → Batch operation (3805–1 to n)

Description Use this function to enter the batch operation: control recipe operation number to identify the active control recipe operation.

User entry 0 to 65 535

Factory setting 0

Batch phase

Navigation Expert → Application → Totalizer 1 to n → Batch phase (3806–1 to n)

Description Use this function to enter the batch phase: control recipe phase number to identify the active control recipe operation.

User entry 0 to 65 535

Factory setting 0

Batch Recipe

Navigation Expert → Application → Totalizer 1 to n → Batch Recipe (3807–1 to n)

Description Use this function to enter the batch recipe unit procedure (RUP): identification of the active control recipe unit procedure or the associated unit (e.g. inductor, centrifuge, drying agent).

User entry 0 to 65 535

Factory setting 0

Additional information *Description*

The unit is defined in IEC61512 Part1/ISA S88 but its meaning is different to that of the parameter unit, such as system units.

Alarm hysteresis

Navigation Expert → Application → Totalizer 1 to n → Alarm hysteresis (3802–1 to n)

Description Use this function to enter the hysteresis value for the upper and lower warning or alarm limit values.

User entry Signed floating-point number

Factory setting 0 kg

Additional information *User entry*

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 160).

Hi Hi Lim

Navigation Expert → Application → Totalizer 1 to n → Hi Hi Lim (3815–1 to n)

Description Use this function to enter the value for the upper alarm limit of the totalizer (**HiHi alarm value** parameter (→ 170)).

User entry Signed floating-point number

Factory setting Positive floating-point number

Additional information

Description

If the output value Out value (→ 118) exceeds this limit value, the **HiHi alarm state** parameter (→ 171) is output.

User entry

The value is entered in the defined units (**Out unit** parameter (→ 124)) and must be in the range defined in the **Out scale low** parameter (→ 123) and **Out scale up** parameter (→ 123).

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 160).

Hi Lim

Navigation Expert → Application → Totalizer 1 to n → Hi Lim (3816–1 to n)

Description Use this function to enter the value for the upper warning limit of the totalizer (**Hi alarm value** parameter (→ 171)).

User entry Signed floating-point number

Factory setting Positive floating-point number

Additional information

Description

If the output value Out value (→ 118) exceeds this limit value, the **Hi alarm state** parameter (→ 171) is output.

User entry

The value is entered in the defined units (**Out unit** parameter (→ 124)) and must be in the range defined in the **Out scale low** parameter (→ 123) and **Out scale up** parameter (→ 123).

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 160).

Lo Lim

Navigation Expert → Application → Totalizer 1 to n → Lo Lim (3819–1 to n)

Description Use this function to enter the value for the lower warning limit of the totalizer (**Lo alarm value** parameter (→ 171)).

User entry Signed floating-point number

Factory setting Negative floating-point number

Additional information

Description

If the output value Out value (→ 118) exceeds this limit value, the **Lo alarm state** parameter (→ 172) is output.

User entry

The value is entered in the defined units (**Out unit** parameter (→ 124)) and must be in the range defined in the **Out scale low** parameter (→ 123) and **Out scale up** parameter (→ 123).

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 160).

Lo Lo Lim

Navigation Expert → Application → Totalizer 1 to n → Lo Lo Lim (3822–1 to n)

Description Use this function to enter the value for the lower alarm limit of the totalizer (**LoLo alarm value** parameter (→ 172)).

User entry Signed floating-point number

Factory setting Negative floating-point number

Additional information

Description

If the output value Out value (→ 118) exceeds this limit value, the **LoLo alarm state** parameter (→ 172) is output.

User entry

The value is entered in the defined units (**Out unit** parameter (→ 124)) and must be in the range defined in the **Out scale low** parameter (→ 123) and **Out scale up** parameter (→ 123).

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 160).

HiHi alarm value

Navigation Expert → Application → Totalizer 1 to n → HiHi alarm value (3814–1 to n)

Description Displays the alarm value for the upper alarm limit value (**Hi Hi Lim** parameter (→ 168)).

User interface Signed floating-point number

HiHi alarm state

Navigation Expert → Application → Totalizer 1 to n → HiHi alarm state (3813–1 to n)

Description Displays the status for the upper alarm limit value (**Hi Hi Lim** parameter (→ 168)).

User interface
- No alarm
- Alm statHiHi lim

Additional information *User interface*

The display contains information such as the time of the alarm (date and time) and the value that triggered the alarm.

Hi alarm value

Navigation Expert → Application → Totalizer 1 to n → Hi alarm value (3812–1 to n)

Description Displays the warning value for the upper warning limit value (**Hi Lim** parameter (→ 169)).

User interface Signed floating-point number

Hi alarm state

Navigation Expert → Application → Totalizer 1 to n → Hi alarm state (3811–1 to n)

Description Displays the status for the upper warning limit value (**Hi Lim** parameter (→ 169)).

User interface
- No warning
- Alrm stat Hi lim

Additional information *User interface*

The display contains information such as the time of the warning (date and time) and the value that triggered the alarm.

Lo alarm value

Navigation Expert → Application → Totalizer 1 to n → Lo alarm value (3818–1 to n)

Description Displays the warning value for the lower warning limit value (**Lo Lim** parameter (→ 169)).

User interface Signed floating-point number

Lo alarm state

Navigation Expert → Application → Totalizer 1 to n → Lo alarm state (3817–1 to n)

Description Displays the status for the lower warning limit value (**Lo Lim** parameter (→ 169)).

User interface
- No warning
- Alrm stat Lo lim

Additional information *User interface*

The display contains information such as the time of the warning (date and time) and the value that triggered the alarm.

LoLo alarm value

Navigation Expert → Application → Totalizer 1 to n → LoLo alarm value (3821–1 to n)

Description Displays the alarm value for the lower alarm limit value (**Lo Lo Lim** parameter (→ 170)).

User interface Signed floating-point number

LoLo alarm state

Navigation Expert → Application → Totalizer 1 to n → LoLo alarm state (3820–1 to n)

Description Displays the status for the lower alarm limit value (**Lo Lo Lim** parameter (→ 170)).

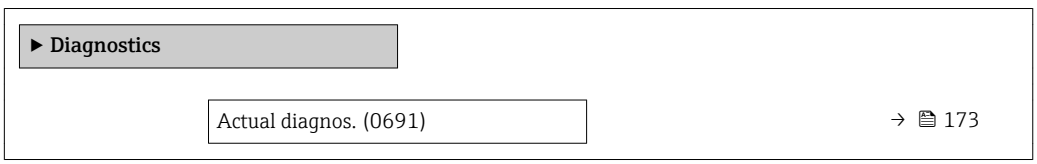
User interface
- No alarm
- Alm statLoLo lim

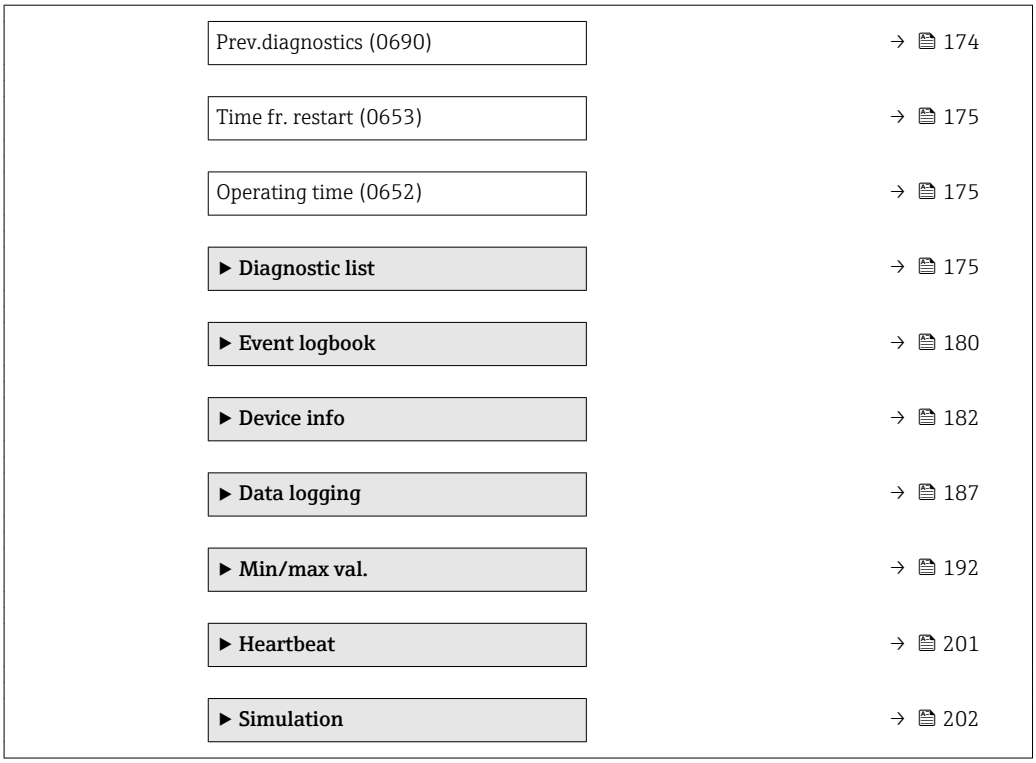
Additional information *User interface*

The display contains information such as the time of the alarm (date and time) and the value that triggered the alarm.

3.10 "Diagnostics" submenu

Navigation Expert → Diagnostics





Actual diagnos.

Navigation Expert → Diagnostics → Actual diagnos. (0691)

Prerequisite A diagnostic event has occurred.

Description Displays the current diagnostic message. If two or more messages occur simultaneously, the message with the highest priority is shown on the display.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Display*

Additional pending diagnostic messages can be viewed in the **Diagnostic list** submenu (→ 175).

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

Example

For the display format:
⊗F271 Main electronic

Timestamp

Navigation Expert → Diagnostics → Timestamp

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

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

Additional information *Display*

The diagnostic message can be viewed via the **Actual diagnos.** parameter (→ 173).

Example

For the display format:
24d12h13m00s

Prev.diagnostics

Navigation Expert → Diagnostics → Prev.diagnostics (0690)

Prerequisite Two diagnostic events have already occurred.

Description Displays the diagnostic message that occurred before the current message.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Display*

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

Example

For the display format:
⊗F271 Main electronic

Timestamp

Navigation Expert → Diagnostics → Timestamp

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

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

Additional information *Display*

The diagnostic message can be viewed via the **Prev.diagnostics** parameter (→ 174).

Example

For the display format:
24d12h13m00s

Time fr. restart

Navigation Expert → Diagnostics → Time fr. restart (0653)

Description Use this function to display the time the device has been in operation since the last device restart.

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

Operating time

Navigation Expert → Diagnostics → Operating time (0652)

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

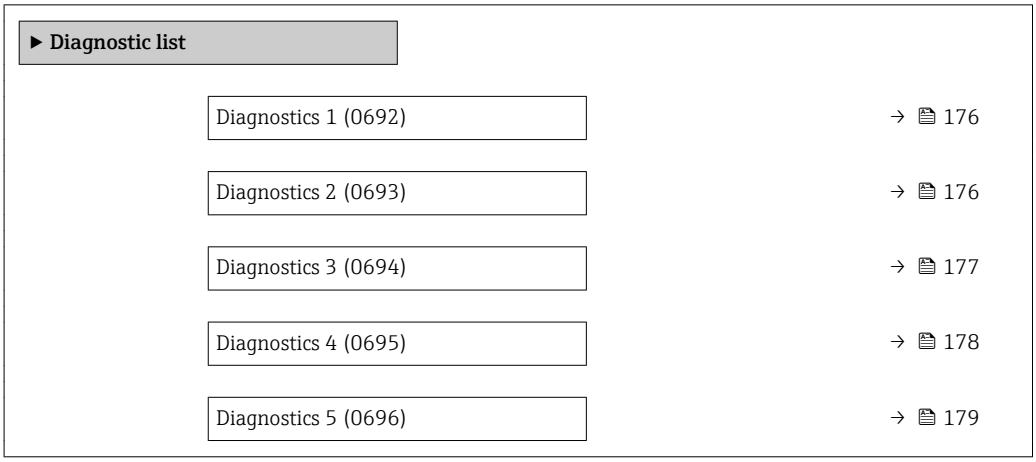
User interface Days (d), hours (h), minutes (m) and seconds (s)

Additional information *User interface*

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

3.10.1 "Diagnostic list" submenu

Navigation Expert → Diagnostics → Diagnostic list



Diagnostics 1

Navigation Expert → Diagnostics → Diagnostic list → Diagnostics 1 (0692)

Description Displays the current diagnostics message with the highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information

Display

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

Examples

For the display format:
- ⚠S442 Freq. output
- ⊗F276 I/O module

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp

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

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

Additional information

Display

The diagnostic message can be viewed via the **Diagnostics 1** parameter (→ 176).

Example

For the display format:
24d12h13m00s

Diagnostics 2

Navigation Expert → Diagnostics → Diagnostic list → Diagnostics 2 (0693)

Description Displays the current diagnostics message with the second-highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Display*

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

Examples

For the display format:
- ⚠S442 Freq. output
- ⊗F276 I/O module

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp

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

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

Additional information *Display*

The diagnostic message can be viewed via the **Diagnostics 2** parameter (→ 176).

Example

For the display format:
24d12h13m00s

Diagnostics 3

Navigation Expert → Diagnostics → Diagnostic list → Diagnostics 3 (0694)

Description Displays the current diagnostics message with the third-highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Display*

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

Examples

For the display format:
- ⚠S442 Freq. output
- ⊗F276 I/O module

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp

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

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

Additional information *Display*

The diagnostic message can be viewed via the **Diagnostics 3** parameter (→ 177).

Example

For the display format:
24d12h13m00s

Diagnostics 4

Navigation Expert → Diagnostics → Diagnostic list → Diagnostics 4 (0695)

Description Displays the current diagnostics message with the fourth-highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Display*

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

Examples

For the display format:
- ⚠S442 Freq. output
- ⊗F276 I/O module

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp

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

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

Additional information *Display*

The diagnostic message can be viewed via the **Diagnostics 4** parameter (→ 178).

Example

For the display format:
24d12h13m00s

Diagnostics 5

Navigation Expert → Diagnostics → Diagnostic list → Diagnostics 5 (0696)

Description Displays the current diagnostics message with the fifth-highest priority.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *Display*

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

Examples

For the display format:
- ⚠S442 Freq. output
- ⊗F276 I/O module

Timestamp

Navigation Expert → Diagnostics → Diagnostic list → Timestamp

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

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

Additional information *Display*

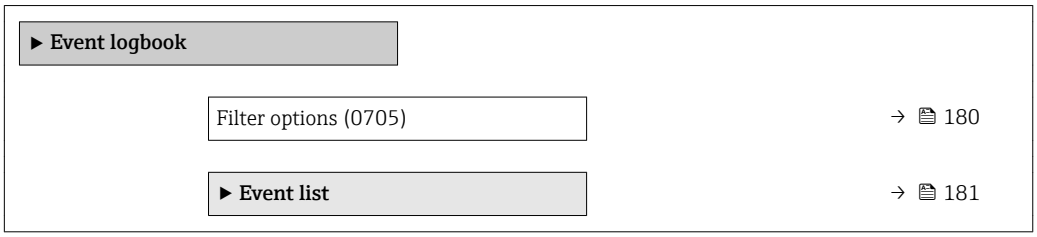
The diagnostic message can be viewed via the **Diagnostics 5** parameter (→ 179).

Example

For the display format:
24d12h13m00s

3.10.2 "Event logbook" submenu

Navigation Expert → Diagnostics → Event logbook



Filter options

Navigation Expert → Diagnostics → Event logbook → Filter options (0705)

Description Use this function to select the category whose event messages are displayed in the event list of the local display.

Selection
- All
- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- Information (I)

Factory setting All

Additional information *Description*

The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:
- F = Failure
- C = Function Check
- S = Out of Specification
- M = Maintenance Required

Filter options

Navigation Expert → Diagnostics → Event logbook → Filter options

Description Use this function to select the category whose event messages are displayed in the event list of the operating tool.

Selection
- All
- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- Information (I)

Factory setting All

Additional information *Description*

The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:
- F = Failure
- C = Function Check
- S = Out of Specification
- M = Maintenance Required

"Event list" submenu

The **Event list** submenu is only displayed if operating via the local display.

If operating via the FieldCare operating tool, the event list can be read out with a separate FieldCare module.

Navigation Expert → Diagnostics → Event logbook → Event list

Event list

Navigation Expert → Diagnostics → Event logbook → Event list

Description Displays the history of event messages of the category selected in the **Filter options** parameter (→ 180).

User interface
- For a "Category I" event message
  Information event, short message, symbol for event recording and operating time when error occurred
- For a "Category F, C, S, M" event message (status signal)
  Diagnostics code, short message, symbol for event recording and operating time when error occurred

Additional information *Description*

A maximum of 20 event messages are displayed in chronological order.

If the **Extended HistoROM** application package (order option) is enabled in the device, the event list can contain up to 100 entries .

The following symbols indicate whether an event has occurred or has ended:
- ⊕: Occurrence of the event
- ⊖: End of the event

Examples

For the display format:
- I1091 Configuration modified
  ⊕ 24d12h13m00s
- ⚠S442 Freq. output
  ⊕ 01d04h12min30s

Additional information, such as remedial measures, can be retrieved via the E key.

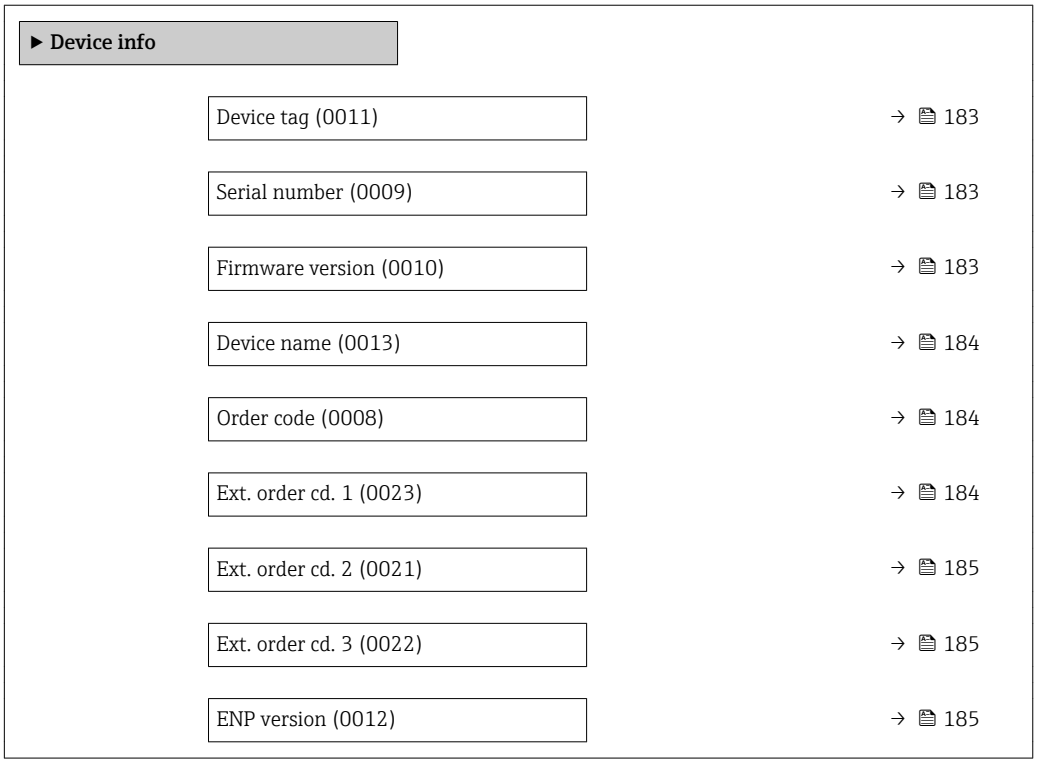
HistoROM

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

To order the **Extended HistoROM** application package, see the "Application packages" section of the "Technical Information" document

3.10.3 "Device info" submenu

Navigation Expert → Diagnostics → Device info



Device tag

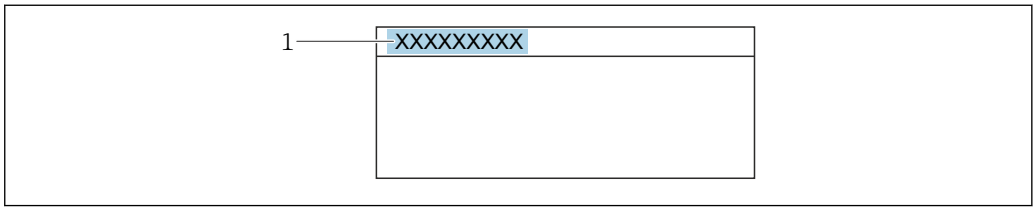
Navigation Expert → Diagnostics → Device info → Device tag (0011)

Description Displays a unique name for the measuring point so it can be identified quickly within the plant. The name is displayed in the header.

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

Factory setting Promass

Additional information *Display*



1 Position of the header text on the display

The number of characters displayed depends on the characters used.

Serial number

Navigation Expert → Diagnostics → Device info → Serial number (0009)

Description Displays the serial number of the measuring device.

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

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

Additional information *Description*

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

Firmware version

Navigation Expert → Diagnostics → Device info → Firmware version (0010)

Description Displays the device firmware version installed.

User interface Character string in the format xx.yy.zz

Additional information *Display*

The Firmware version is also located:
- On the title page of the Operating instructions
- On the transmitter nameplate

Device name

Navigation Expert → Diagnostics → Device info → Device name (0013)

Description Displays the name of the transmitter. It can also be found on the nameplate of the transmitter.

User interface Max. 32 characters such as letters or numbers.

Factory setting Promass 200

Order code

Navigation Expert → Diagnostics → Device info → Order code (0008)

Description Displays the device order code.

User interface Character string composed of letters, numbers and certain punctuation marks (e.g. /).

Additional information *Description*

The order code can be found on the nameplate of the sensor and transmitter in the "Order code" field.

The order code is generated from the extended order code through a process of reversible transformation. The extended order code indicates the attributes for all the device features in the product structure. The device features are not directly readable from the order code.

Uses of the order code
- To order an identical spare device.
- To identify the device quickly and easily, e.g. when contacting Endress+Hauser.

Ext. order cd. 1

Navigation Expert → Diagnostics → Device info → Ext. order cd. 1 (0023)

Description Displays the first part of the extended order code.

On account of length restrictions, the extended order code is split into a maximum of 3 parameters.

User interface Character string

Additional information *Description*

The extended order code indicates the version of all the features of the product structure for the measuring device and thus uniquely identifies the measuring device.

The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.

Ext. order cd. 2

Navigation Expert → Diagnostics → Device info → Ext. order cd. 2 (0021)

Description Displays the second part of the extended order code.

User interface Character string

Additional information For additional information, see **Ext. order cd. 1** parameter (→ 184)

Ext. order cd. 3

Navigation Expert → Diagnostics → Device info → Ext. order cd. 3 (0022)

Description Displays the third part of the extended order code.

User interface Character string

Additional information For additional information, see **Ext. order cd. 1** parameter (→ 184)

Config. counter

Navigation Expert → Diagnostics → Device info → Config. counter (0233)

Description Displays the number of parameter modifications for the device. When the user changes a parameter setting, this counter is incremented.

User interface 0 to 65 535

ENP version

Navigation Expert → Diagnostics → Device info → ENP version (0012)

Description Displays the version of the electronic nameplate.

User interface Character string

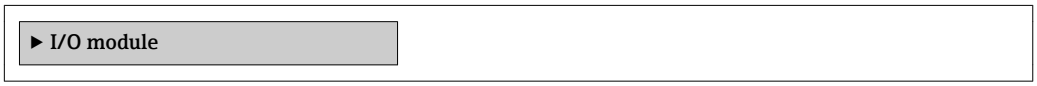
Factory setting 2.02.00

Additional information *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.

3.10.4 "I/O module" submenu

Navigation Expert → Diagnostics → I/O module



Software rev.

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

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

User interface Positive integer

3.10.5 "Display module" submenu

Navigation Expert → Diagnostics → Display module

Software rev.

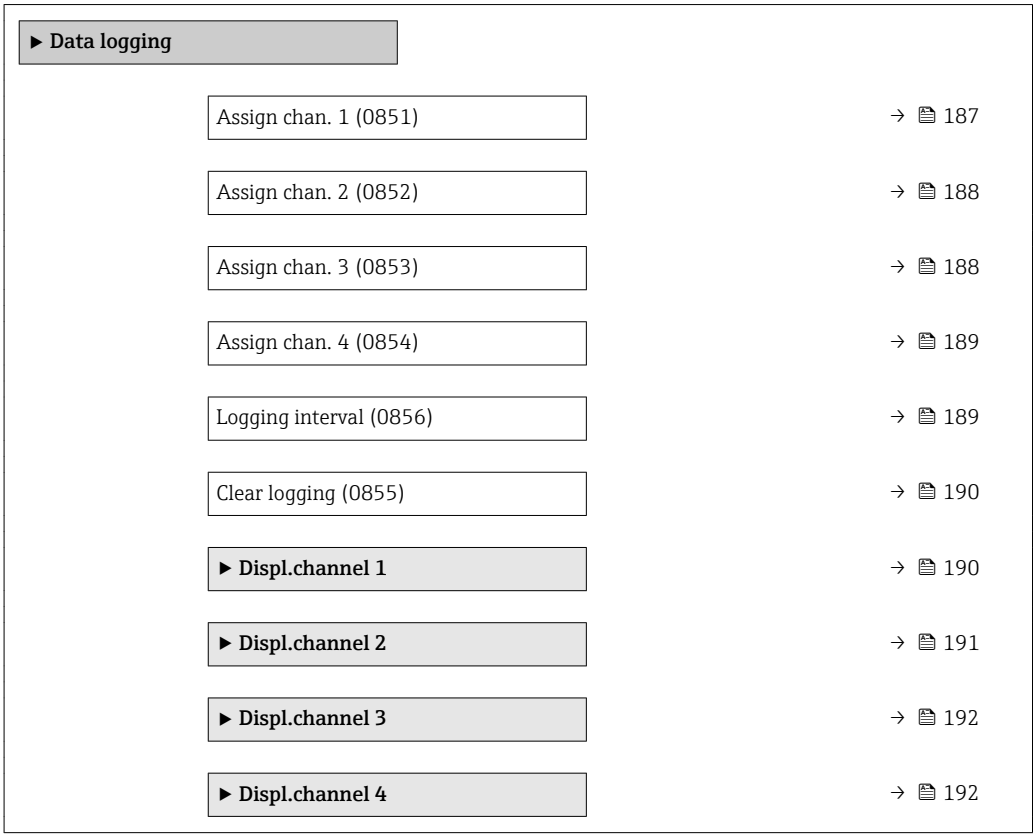
Navigation Expert → Diagnostics → Display module → Software rev. (0072)

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

User interface Positive integer

3.10.6 "Data logging" submenu

Navigation Expert → Diagnostics → Data logging



Assign chan. 1

Navigation Expert → Diagnostics → Data logging → Assign chan. 1 (0851)

Prerequisite The **Extended HistoROM** application package is available.

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 43).

Description Use this function to select a process variable for the data logging channel.

Selection
- Off
- Mass flow
- Volume flow
- Correct.vol.flow
- Density
- Ref.density
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Oscil. frequency

* Visibility depends on order options or device settings

- Oscil. amplitude
- Oscil. damping
- Signal asymmetry

Factory setting Off

Additional information *Description*

A total of 1000 measured values can be logged. This means:
- 1000 data points if 1 logging channel is used
- 500 data points if 2 logging channels are used
- 333 data points if 3 logging channels are used
- 250 data points if 4 logging channels are used

Once the maximum number of data points is reached, the oldest data points in the data log are cyclically overwritten in such a way that the last 1000, 500, 333 or 250 measured values are always in the log (ring memory principle).

The log contents are cleared if the option selected is changed.

Selection

Detailed description of the options **Oscil. frequency, Oscil. amplitude, Oscil. damping** and **Signal asymmetry**: **Assign freq.** parameter (→ 89)

Assign chan. 2

Navigation Expert → Diagnostics → Data logging → Assign chan. 2 (0852)

Prerequisite The **Extended HistoROM** application package is available.

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 43).

Description Options for the assignment of a process variable to the data logging channel.

Selection Picklist, see **Assign channel 1** parameter (→ 187)

Factory setting Off

Assign chan. 3

Navigation Expert → Diagnostics → Data logging → Assign chan. 3 (0853)

Prerequisite The **Extended HistoROM** application package is available.

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 43).

Description Options for the assignment of a process variable to the data logging channel.

Selection Picklist, see **Assign channel 1** parameter (→ 187)

Factory setting Off

Assign chan. 4

Navigation Expert → Diagnostics → Data logging → Assign chan. 4 (0854)

Prerequisite The **Extended HistoROM** application package is available.

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 43).

Description Options for the assignment of a process variable to the data logging channel.

Selection Picklist, see **Assign channel 1** parameter (→ 187)

Factory setting Off

Logging interval

Navigation Expert → Diagnostics → Data logging → Logging interval (0856)

Prerequisite The **Extended HistoROM** application package is available.

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 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 T_{log} always remains in the memory (ring memory principle).

The log contents are cleared if the length of the logging interval is changed.

Example

If 1 logging channel is used:
- $T_{log} = 1000 \times 1$ 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

Navigation Expert → Diagnostics → Data logging → Clear logging (0855)

Prerequisite The **Extended HistoROM** application package is available.

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 43).

Description Use this function to clear the entire logging data.

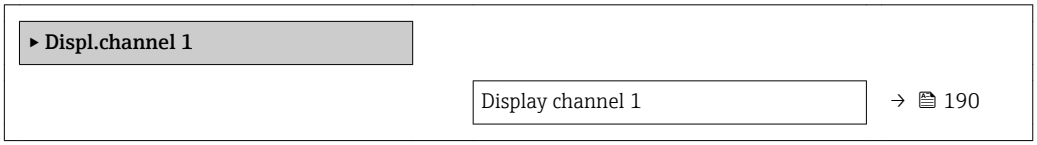
Selection
- Cancel
- Clear data

Factory setting Cancel

Additional information *Selection*
- Cancel
  The data is not cleared. All the data is retained.
- Clear data
  The logging data is cleared. The logging process starts from the beginning.

"Displ.channel 1" submenu

Navigation Expert → Diagnostics → Data logging → Displ.channel 1



Display channel 1

Navigation Expert → Diagnostics → Data logging → Displ.channel 1

Prerequisite The **Extended HistoROM** application package is available.

The software options currently enabled are displayed in the **SW option overv.** parameter (→ 43).

One of the following options is selected in the **Assign chan. 1** parameter (→ 187):
- Mass flow
- Volume flow
- Correct.vol.flow
- Density
- Ref.density
- Temperature
- Carr. pipe temp. *

* Visibility depends on order options or device settings

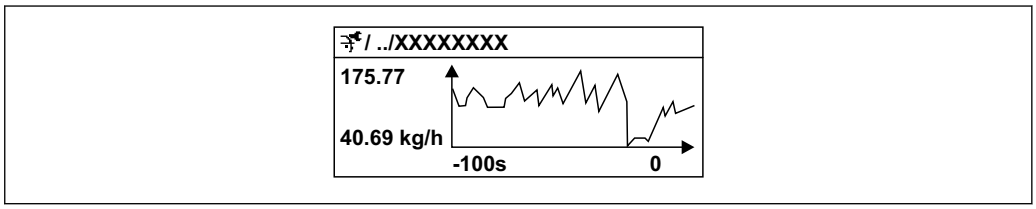
- Electronic temp.
- Oscil. frequency
- Oscil. amplitude
- Oscil. damping
- Signal asymmetry

Description Displays the measured value trend for the logging channel in the form of a chart.

Additional information *Prerequisite*

Detailed description of the options **Oscil. frequency, Oscil. amplitude, Oscil. damping** and **Signal asymmetry**: **Assign freq.** parameter (→ 89)

Description

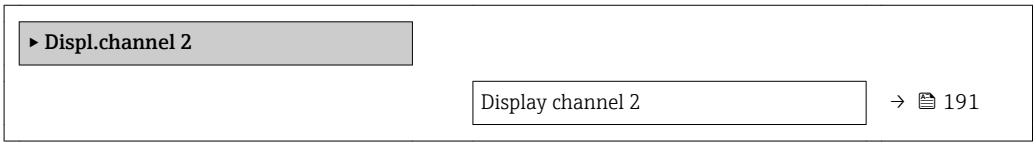


6 *Chart of a measured value trend*

- x-axis: depending on the number of channels selected displays 250 to 1000 measured values of a process variable.
- y-axis: displays the approximate measured value span and constantly adapts this to the ongoing measurement.

"Displ.channel 2" submenu

Navigation Expert → Diagnostics → Data logging → Displ.channel 2



Display channel 2

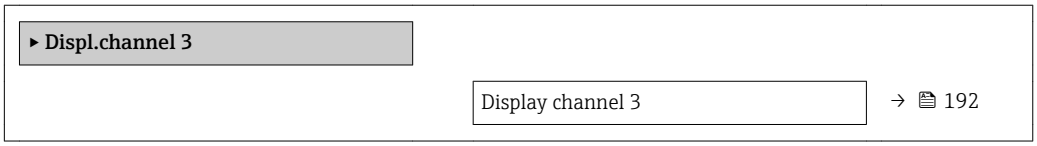
Navigation Expert → Diagnostics → Data logging → Displ.channel 2

Prerequisite A process variable is defined in the **Assign chan. 2** parameter.

Description See the **Display channel 1** parameter → 190

"Displ.channel 3" submenu

Navigation Expert → Diagnostics → Data logging → Displ.channel 3



Display channel 3

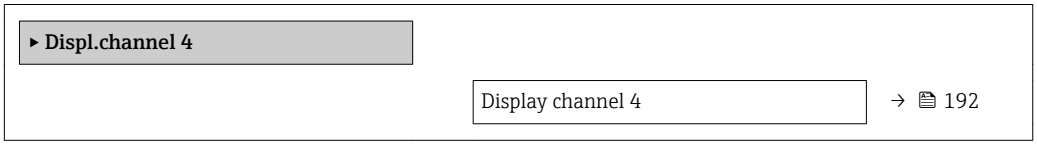
Navigation Expert → Diagnostics → Data logging → Displ.channel 3

Prerequisite A process variable is defined in the **Assign chan. 3** parameter.

Description See the **Display channel 1** parameter → 190

"Displ.channel 4" submenu

Navigation Expert → Diagnostics → Data logging → Displ.channel 4



Display channel 4

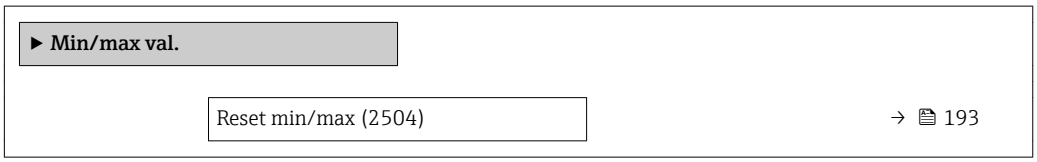
Navigation Expert → Diagnostics → Data logging → Displ.channel 4

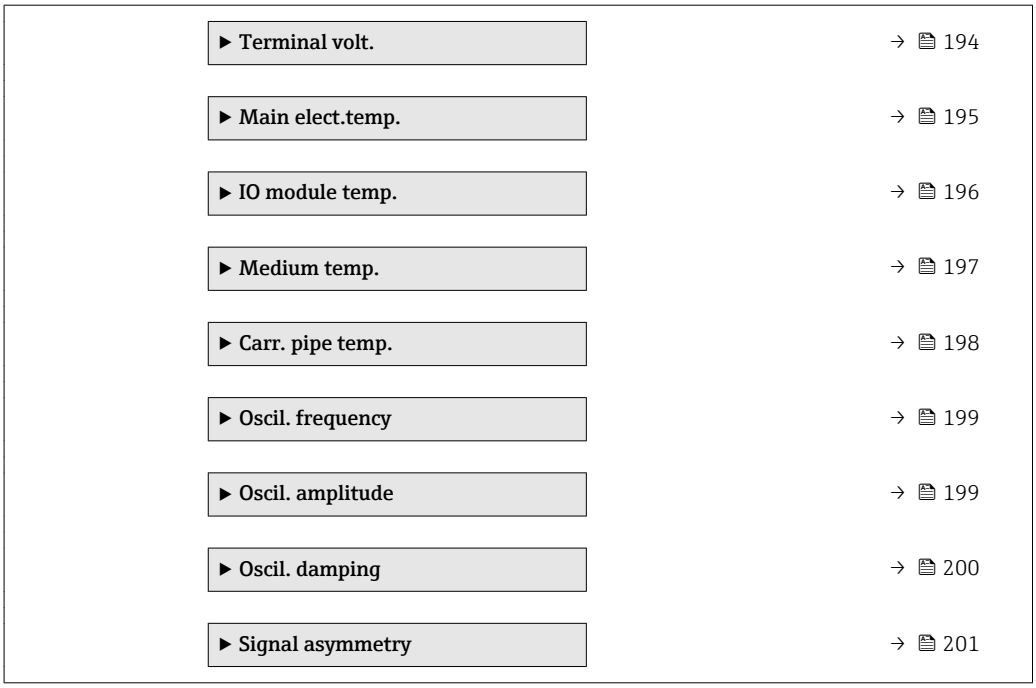
Prerequisite A process variable is defined in the **Assign chan. 4** parameter.

Description See the **Display channel 1** parameter → 190

3.10.7 "Min/max val." submenu

Navigation Expert → Diagnostics → Min/max val.





Reset min/max

Navigation Expert → Diagnostics → Min/max val. → Reset min/max (2504)

Description Use this function to select measured variables whose minimum, maximum and average measured values are to be reset.

Selection
- Cancel
- Terminal volt. 1
- IO module temp.
- Oscil. amplitude
- Oscil. damping
- Oscil. frequency
- Signal asymmetry

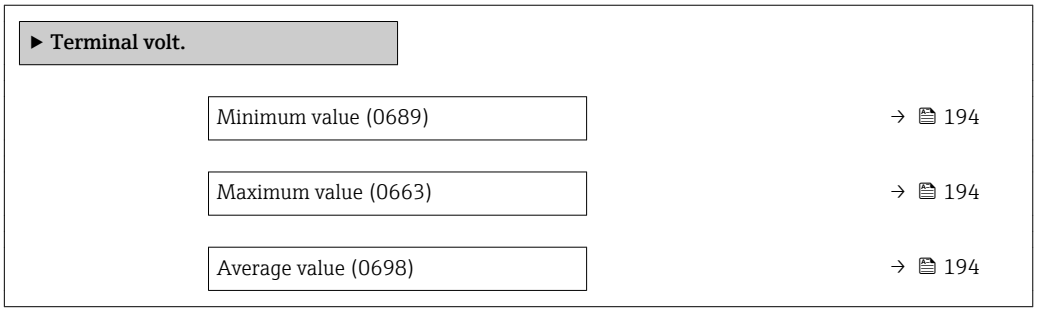
Factory setting Cancel

Additional information *Options*

Detailed description of the options **Oscil. frequency, Oscil. amplitude, Oscil. damping** and **Signal asymmetry**: **Assign freq.** parameter (→ 89)

"Terminal volt." 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

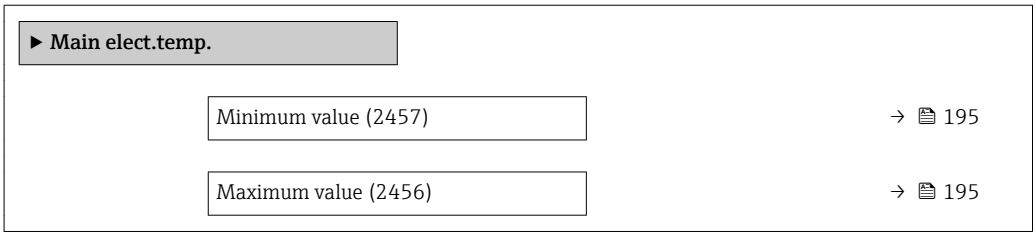
Navigation Expert → Diagnostics → Min/max val. → Terminal volt. → Average value (0698)

Description Use this function to view the average of all previously measured terminal voltage values in Volts.

User interface Signed floating-point number

"Main elect.temp." submenu

Navigation Expert → Diagnostics → Min/max val. → Main elect.temp.



Minimum value

Navigation Expert → Diagnostics → Min/max val. → Main elect.temp. → Minimum value (2457)

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 (→ 56)

Maximum value

Navigation Expert → Diagnostics → Min/max val. → Main elect.temp. → Maximum value (2456)

Description Displays the highest previously measured temperature value of the main electronics module.

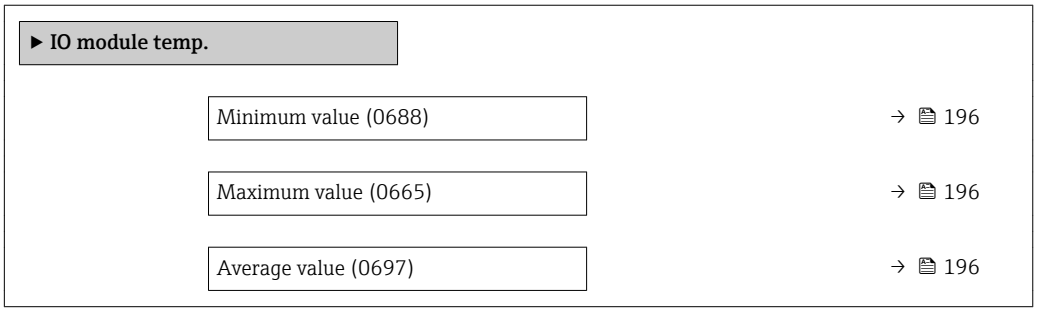
User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Temperature unit** parameter (→ 56)

"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 Displays 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 (→ 56)

Maximum value

Navigation Expert → Diagnostics → Min/max val. → IO module temp. → Maximum value (0665)

Description Displays 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 (→ 56)

Average value

Navigation Expert → Diagnostics → Min/max val. → IO module temp. → Average value (0697)

Description Displays the average value of all previously measured temperature values of the I/O electronics module.

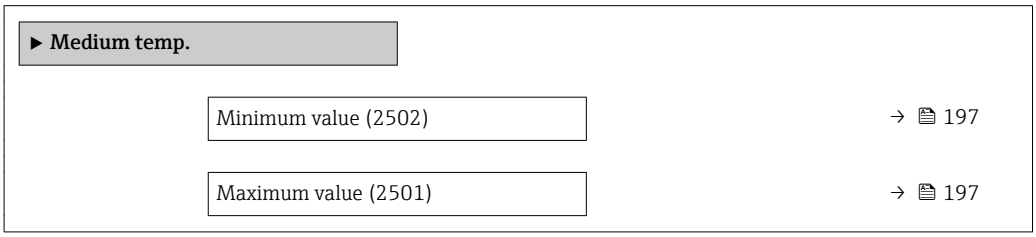
User interface −1 273.15 to 726.85 °C

Additional information *Dependency*

The unit is taken from the **Temperature unit** parameter (→ 56)

"Medium temp." submenu

Navigation Expert → Diagnostics → Min/max val. → Medium temp.



Minimum value

Navigation Expert → Diagnostics → Min/max val. → Medium temp. → Minimum value (2502)

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 (→ 56)

Maximum value

Navigation Expert → Diagnostics → Min/max val. → Medium temp. → Maximum value (2501)

Description Displays the highest previously measured medium temperature value.

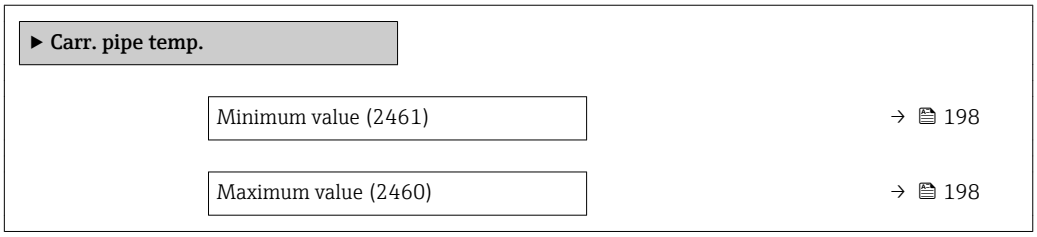
User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Temperature unit** parameter (→ 56)

"Carr. pipe temp." submenu

Navigation Expert → Diagnostics → Min/max val. → Carr. pipe temp.



Minimum value

Navigation Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Minimum value (2461)

Prerequisite If the carrier tube temperature is available (applies only to Promass F).

Description Displays the lowest previously measured temperature value of the carrier pipe.

User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Temperature unit** parameter (→ 56)

Maximum value

Navigation Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Maximum value (2460)

Prerequisite If the carrier tube temperature is available (applies only to Promass F).

Description Displays the highest previously measured temperature value of the carrier pipe.

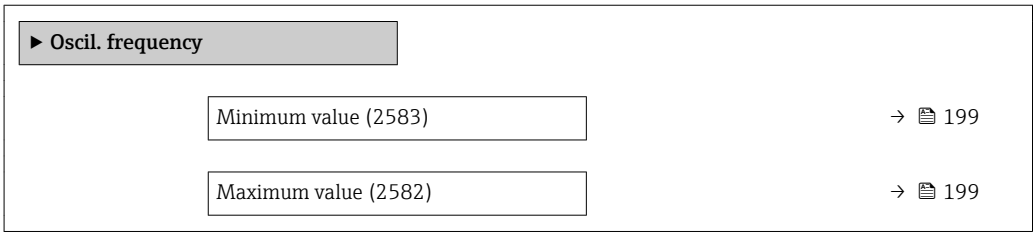
User interface Signed floating-point number

Additional information *Dependency*

The unit is taken from the **Temperature unit** parameter (→ 56)

"Oscil. frequency" submenu

Navigation Expert → Diagnostics → Min/max val. → Oscil. frequency



Minimum value

Navigation Expert → Diagnostics → Min/max val. → Oscil. frequency → Minimum value (2583)

Description Displays the lowest previously measured oscillation frequency.

User interface Signed floating-point number

Maximum value

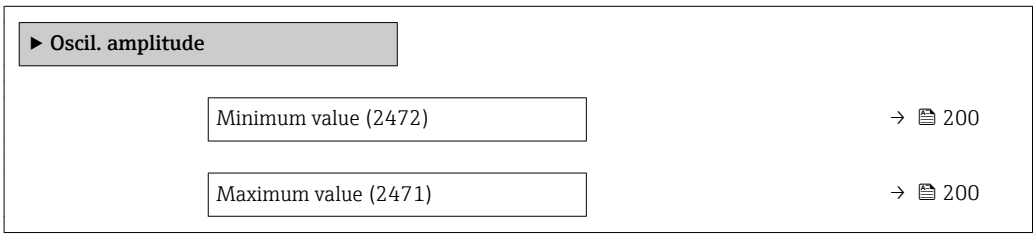
Navigation Expert → Diagnostics → Min/max val. → Oscil. frequency → Maximum value (2582)

Description Displays the highest previously measured oscillation frequency.

User interface Signed floating-point number

"Oscil. amplitude" submenu

Navigation Expert → Diagnostics → Min/max val. → Oscil. amplitude



Minimum value

Navigation Expert → Diagnostics → Min/max val. → Oscil. amplitude → Minimum value (2472)

Description Displays the lowest previously measured oscillation amplitude.

User interface Signed floating-point number

Maximum value

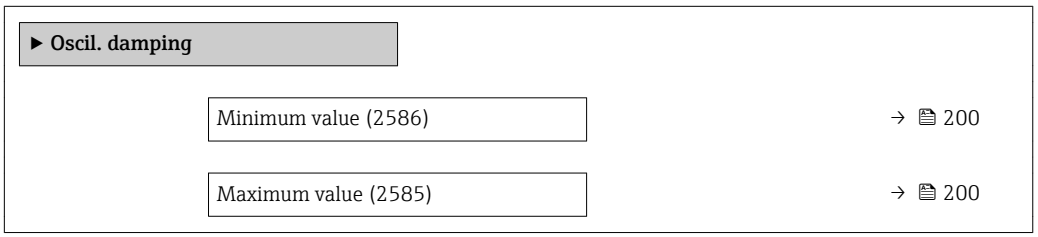
Navigation Expert → Diagnostics → Min/max val. → Oscil. amplitude → Maximum value (2471)

Description Displays the highest previously measured oscillation amplitude.

User interface Signed floating-point number

"Oscil. damping" submenu

Navigation Expert → Diagnostics → Min/max val. → Oscil. damping



Minimum value

Navigation Expert → Diagnostics → Min/max val. → Oscil. damping → Minimum value (2586)

Description Displays the lowest previously measured oscillation damping.

User interface Signed floating-point number

Maximum value

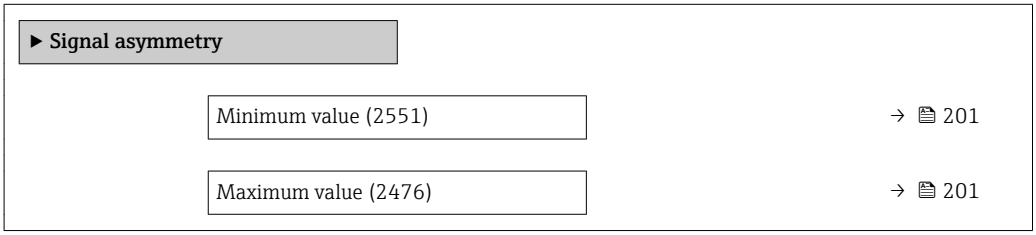
Navigation Expert → Diagnostics → Min/max val. → Oscil. damping → Maximum value (2585)

Description Displays the highest previously measured oscillation damping.

User interface Signed floating-point number

"Signal asymmetry" submenu

Navigation Expert → Diagnostics → Min/max val. → Signal asymmetry



Minimum value

Navigation Expert → Diagnostics → Min/max val. → Signal asymmetry → Minimum value (2551)

Description Displays the lowest previously measured signal asymmetry.

User interface Signed floating-point number

Maximum value

Navigation Expert → Diagnostics → Min/max val. → Signal asymmetry → Maximum value (2476)

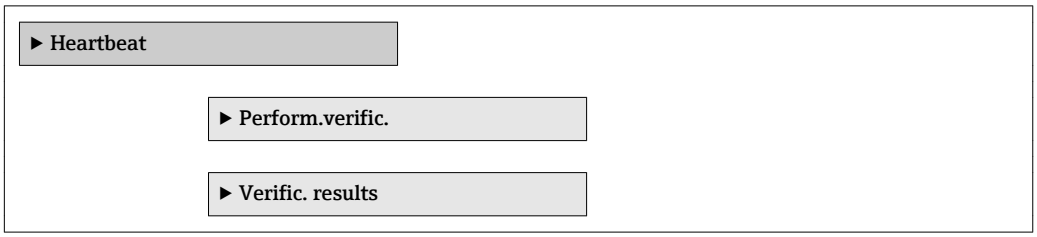
Description Displays the highest previously measured signal asymmetry.

User interface Signed floating-point number

3.10.8 "Heartbeat" submenu

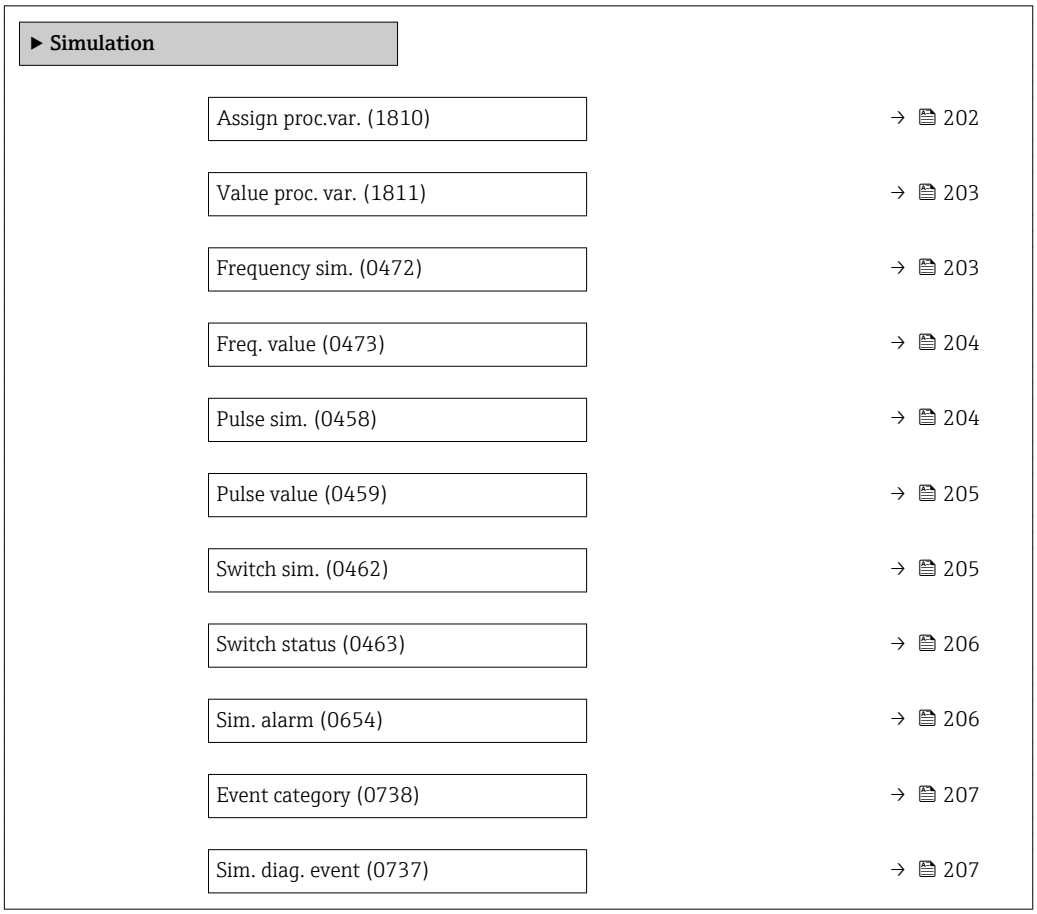
For detailed information on the parameter descriptions for the **Heartbeat Verification+Monitoring**application package, refer to the Special Documentation for the device → 7

Navigation Expert → Diagnostics → Heartbeat



3.10.9 "Simulation" submenu

Navigation Expert → Diagnostics → Simulation



Assign proc.var.

Navigation Expert → Diagnostics → Simulation → Assign proc.var. (1810)

Description Use this function to select a process variable for the simulation process that is activated. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection
- Off
- Mass flow
- Volume flow

- Correct.vol.flow
- Density
- Ref.density
- Temperature

Factory setting Off

Additional information *Description*

The simulation value of the process variable selected is defined in the **Value proc. var.** parameter (→ 203).

Value proc. var.

Navigation Expert → Diagnostics → Simulation → Value proc. var. (1811)

Prerequisite A process variable is selected in the **Assign proc.var.** parameter (→ 202).

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 (→ 51).

Frequency sim.

Navigation Expert → Diagnostics → Simulation → Frequency sim. (0472)

Prerequisite In the **Operating mode** parameter (→ 84), the **Frequency** option is selected.

Description Use this function to switch simulation of the frequency output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting Off

Additional information

Description

The desired simulation value is defined in the **Freq. value** parameter (→ 204).

Selection

- Off
  Frequency simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
  Frequency simulation is active.

Freq. value

Navigation Expert → Diagnostics → Simulation → Freq. value (0473)

Prerequisite In the **Frequency sim.** parameter (→ 203), the **On** option is selected.

Description Use this function to enter a frequency value for the simulation. In this way, users can verify the correct adjustment of the frequency output and the correct function of downstream switching units.

User entry 0.0 to 1250.0 Hz

Pulse sim.

Navigation Expert → Diagnostics → Simulation → Pulse sim. (0458)

Prerequisite In the **Operating mode** parameter (→ 84), the **Pulse** option is selected.

Description Use this function to switch simulation of the pulse output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- Fixed value
- Down-count. val.

Factory setting Off

Additional information

Description

The desired simulation value is defined in the **Pulse value** parameter (→ 205).

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 (→ 86).
- Down-count. val.
  The pulses specified in the **Pulse value** parameter (→ 205) are output.

Pulse value

Navigation Expert → Diagnostics → Simulation → Pulse value (0459)

Prerequisite In the **Pulse sim.** parameter (→ 204), the **Down-count. val.** option is selected.

Description Use this function to enter a pulse value for the simulation. In this way, users can verify the correct adjustment of the pulse output and the correct function of downstream switching units.

User entry 0 to 65 535

Switch sim.

Navigation Expert → Diagnostics → Simulation → Switch sim. (0462)

Prerequisite In the **Operating mode** parameter (→ 84), the **Switch** option is selected.

Description Use this function to switch simulation of the switch output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting Off

Additional information *Description*

The desired simulation value is defined in the **Switch status** parameter (→ 206).

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 In the **Switch sim.** parameter (→ 205) **Switch sim. 1 to n** parameter **Switch sim. 1 to n** parameter, the **On** option is selected.

Description Use this function to select a switch value for the simulation. In this way, users can verify the correct adjustment of the switch output and the correct function of downstream switching units.

Selection
- Open
- Closed

Additional information *Selection*

- Open
  Switch simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- Closed
  Switch simulation is active.

Sim. alarm

Navigation Expert → Diagnostics → Simulation → Sim. alarm (0654)

Description Use this function to switch the device alarm on and off.

Selection
- Off
- On

Factory setting Off

Additional information *Description*

The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Event category

Navigation Expert → Diagnostics → Simulation → Event category (0738)

Description Use this function to select the category of the diagnostic events that are displayed for the simulation in the **Sim. diag. event** parameter (→ 207).

Selection
- Sensor
- Electronics
- Configuration
- Process

Factory setting Process

Sim. diag. event

Navigation Expert → Diagnostics → Simulation → Sim. diag. event (0737)

Description Use this function to select a diagnostic event for the simulation process that is activated.

Selection
- Off
- Diagnostic event picklist (depends on the category selected)

Factory setting Off

Additional information *Description*

For the simulation, you can choose from the diagnostic events of the category selected in the **Event category** parameter (→ 207).

4 Country-specific factory settings

4.1 SI units

Not valid for USA and Canada.

4.1.1 System units

Mass	kg
Mass flow	kg/h
Volume	l
Volume flow	l/h
Corrected volume	Nl
Corrected volume flow	Nl/h
Density	kg/l
Reference density	kg/Nl
Temperature	°C
Length	mm
Pressure	bar a

4.1.2 Full scale values

The factory settings applie to the following parameters:
100% bar graph value 1

Nominal diameter [mm]	[kg/h]
1	4
2	20
4	90
8	400
15	1300
25	3600
40	9000
50	14000
80	36000

4.1.3 Pulse value

Nominal diameter [mm]	(~ 2 pulses/s at 2 m/s) [kg/p]
1	0.001
2	0.01
4	0.01
8	0.1
15	0.1

Nominal diameter [mm]	(~ 2 pulses/s at 2 m/s) [kg/p]
25	1
40	1
50	10
80	10

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 for liquid [kg/h]
1	0.08
2	0.4
4	1.8
8	8
15	26
25	72
40	180
50	300
80	720

Nominal diameter [mm]	On-value for gas [kg/h]
1	0.02
2	0.1
4	0.45
8	2
15	6.5
25	18
40	45
50	75
80	180

4.2 US units

Only valid for USA and Canada.

4.2.1 System units

Mass	lb
Mass flow	lb/min
Volume	gal (us)
Volume flow	gal/min (us)

Corrected volume	Sft^3
Corrected volume flow	Sft^3/min
Density	lb/ft^3
Reference density	lb/Sft^3
Temperature	°F
Length	in
Pressure	psi a

4.2.2 Full scale values

The factory settings applie to the following parameters:
100% bar graph value 1

Nominal diameter [in]	[lb/min]
1/24	0.15
1/12	0.75
1/8	3.3
3/8	15
½	50
1	130
1½	330
2	515
3	1320

4.2.3 Pulse value

Nominal diameter [in]	(~ 2 pulses/s at 2.0 m/s) [lb/p]
1/24	0.002
1/12	0.02
1/8	0.02
3/8	0.2
½	0.2
1	2
1½	2
2	20
3	20

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 for liquid [lb/min]
1/24	0.003
1/12	0.015

Nominal diameter [in]	On-value for liquid [lb/min]
1/8	0.066
3/8	0.3
½	1
1	2.6
1½	6.6
2	11
3	26

Nominal diameter [in]	On-value for gas [lb/min]
1/24	0.001
1/12	0.004
1/8	0.016
3/8	0.075
½	0.25
1	0.65
1½	1.65
2	2.75
3	6.5

5 Explanation of abbreviated units

5.1 SI units

Process variable	Units	Explanation
Density	g/cm³, g/m³	Gram/volume unit
	kg/dm³, kg/l, kg/m³	Kilogram/volume unit
	SD4°C, SD15°C, SD20°C	Specific density: The specific density is the ratio of the density of the fluid to the density of water at a water temperature of 4 °C (39 °F), 15 °C (59 °F), 20 °C (68 °F).
	SG4°C, SG15°C, SG20°C	Specific gravity: The specific gravity is the ratio of the density of the fluid to the density of water at a water temperature of 4 °C (39 °F), 15 °C (59 °F), 20 °C (68 °F).
Pressure	Pa a, kPa a, MPa a	Pascal, kilopascal, megapascal (absolute)
	bar	Bar
	Pa g, kPa g, MPa g	Pascal, kilopascal, megapascal (relative/gauge)
	bar g	Bar (relative/gauge)
Length	µm, mm, m	Micrometer, millimeter, meter
Mass	g, kg, t	Gram, kilogram, metric ton
Mass flow	g/s, g/min, g/h, g/d	Gram/time unit
	kg/s, kg/min, kg/h, kg/d	Kilogram/time unit
	t/s, t/min, t/h, t/d	Metric ton/time unit
Ref.density	kg/Nm³, kg/Nl, g/Scm³, kg/Sm³	Kilogram, gram/standard volume unit
Corrected volume	Nl, Nm³, Sm³	Normal liter, normal cubic meter, standard cubic meter
Correct.vol.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 flow	cm³/s, cm³/min, cm³/h, cm³/d	Cubic centimeter/time unit
	dm³/s, dm³/min, dm³/h, dm³/d	Cubic decimeter/time unit
	m³/s, m³/min, m³/h, m³/d	Cubic meter/time unit
	ml/s, ml/min, ml/h, ml/d	Milliliter/time unit
	l/s, l/min, l/h, l/d	Liter/time unit
Time	s, m, h, d, y	Second, minute, hour, day, year

5.2 US units

Process variable	Units	Explanation
Density	lb/ft³, lb/gal (us)	Pound/cubic foot, pound/gallon
	lb/bbl (us;liq.), lb/bbl (us;beer), lb/bbl (us;oil), lb/bbl (us;tank)	Pound/volume unit
Pressure	psi a	Pounds per square inch (absolute)

Process variable	Units	Explanation
	psi g	Pounds per square inch (gauge)
Length	in, ft	Inch, foot
Mass	oz, lb, STon	Ounce, pound, standard ton
Mass flow	oz/s, oz/min, oz/h, oz/d	Ounce/time unit
	lb/s, lb/min, lb/h, lb/d	Pound/time unit
	STon/s, STon/min, STon/h, STon/d	Standard ton/time unit
Ref.density	lb/Sft³	Weight unit/standard volume unit
Corrected volume	Sft³, Sgal (us), Sbbl (us;liq.)	Standard cubic foot, standard gallon, standard barrel
Correct.vol.flow	Sft³/s, Sft³/min, Sft³/h, Sft³/d	Standard cubic foot/time unit
	Sgal/s (us), Sgal/min (us), Sgal/h (us), Sgal/d (us)	Standard gallon/time unit
	Sbbl/s (us;liq.), Sbbl/min (us;liq.), Sbbl/h (us;liq.), Sbbl/d (us;liq.)	Barrel/time unit (normal liquids)
Temperature	°F, °R	Fahrenheit, Rankine
Volume	af	Acre foot
	ft³	Cubic foot
	fl oz (us), gal (us), kgal (us), Mgal (us)	Fluid ounce, gallon, kilogallon, million gallon
	bbl (us;liq.), bbl (us;beer), bbl (us;oil), bbl (us;tank)	Barrel (normal liquids), barrel (beer), barrel (petrochemicals), barrel (filling tanks)
Volume flow	af/s, af/min, af/h, af/d	Acre foot/time unit
	ft³/s, ft³/min, ft³/h, ft³/d	Cubic foot/time unit
	fl oz/s (us), fl oz/min (us), fl oz/h (us), fl oz/d (us)	Fluid ounce/time unit
	gal/s (us), gal/min (us), gal/h (us), gal/d (us)	Gallon/time unit
	kgal/s (us), kgal/min (us), kgal/h (us), kgal/d (us)	Kilogallon/time unit
	Mgal/s (us), Mgal/min (us), Mgal/h (us), Mgal/d (us)	Million gallon/time unit
	bbl/s (us;liq.), bbl/min (us;liq.), bbl/h (us;liq.), bbl/d (us;liq.)	Barrel/time unit (normal liquids) Normal liquids: 31.5 gal/bbl
	bbl/s (us;beer), bbl/min (us;beer), bbl/h (us;beer), bbl/d (us;beer)	Barrel /time unit (beer) Beer: 31.0 gal/bbl
	bbl/s (us;oil), bbl/min (us;oil), bbl/h (us;oil), bbl/d (us;oil)	Barrel/time unit (petrochemicals) Petrochemicals: 42.0 gal/bbl
	bbl/s (us;tank), bbl/min (us;tank), bbl/h (us;tank), bbl/d (us;tank)	Barrel/time unit (filling tank) Filling tanks: 55.0 gal/bbl
Time	s, m, h, d, y	Second, minute, hour, day, year
	am, pm	Ante meridiem (before midday), post meridiem (after midday)

5.3 Imperial units

Process variable	Units	Explanation
Density	lb/gal (imp), lb/bbl (imp;beer), lb/bbl (imp;oil)	Pound/volume unit
Corrected volume	Sgal (imp)	Standard gallon
Correct.vol.flow	Sgal/s (imp), Sgal/min (imp), Sgal/h (imp), Sgal/d (imp)	Standard gallon/time unit
Volume	gal (imp), Mgal (imp)	Gallon, mega gallon
	bbl (imp;beer), bbl (imp;oil)	Barrel (beer), barrel (petrochemicals)
Volume flow	gal/s (imp), gal/min (imp), gal/h (imp), gal/d (imp)	Gallon/time unit
	Mgal/s (imp), Mgal/min (imp), Mgal/h (imp), Mgal/d (imp)	Mega gallon/time unit
	bbl/s (imp;beer), bbl/min (imp;beer), bbl/h (imp;beer), bbl/d (imp;beer)	Barrel /time unit (beer) Beer: 36.0 gal/bbl
	bbl/s (imp;oil), bbl/min (imp;oil), bbl/h (imp;oil), bbl/d (imp;oil)	Barrel/time unit (petrochemicals) Petrochemicals: 34.97 gal/bbl
Time	s, m, h, d, y	Second, minute, hour, day, year
	am, pm	Ante meridiem (before midday), post meridiem (after midday)

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