

Description of Device Parameters

Proline Promag 100

EtherNet/IP

Electromagnetic flowmeter

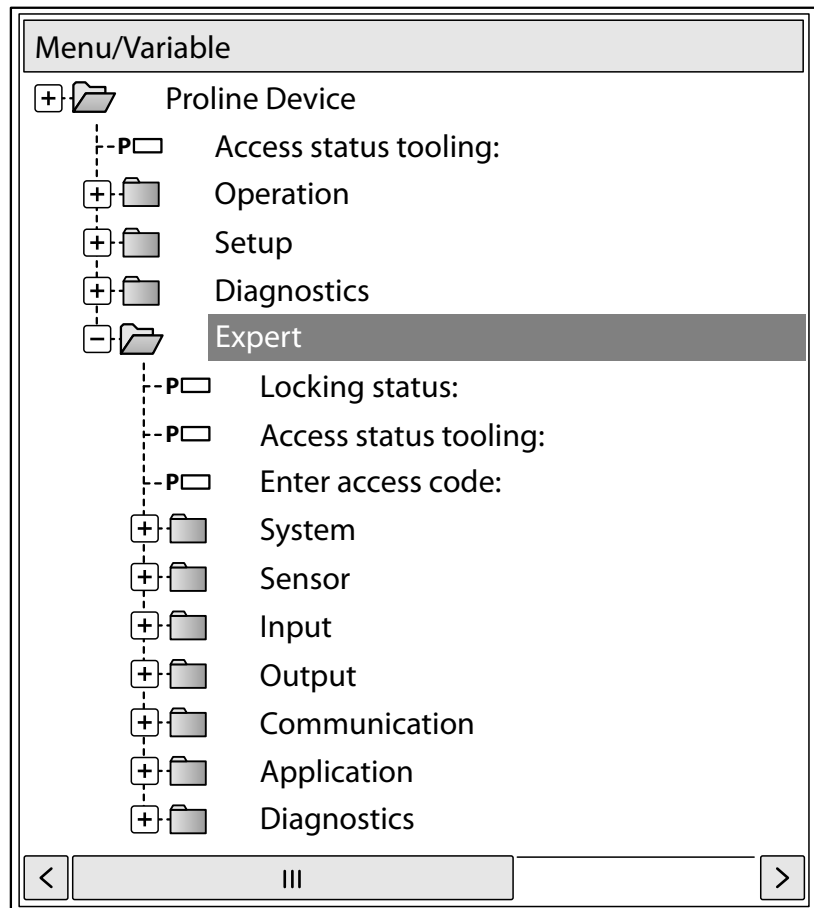


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1 Document information

1.1 Document function


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

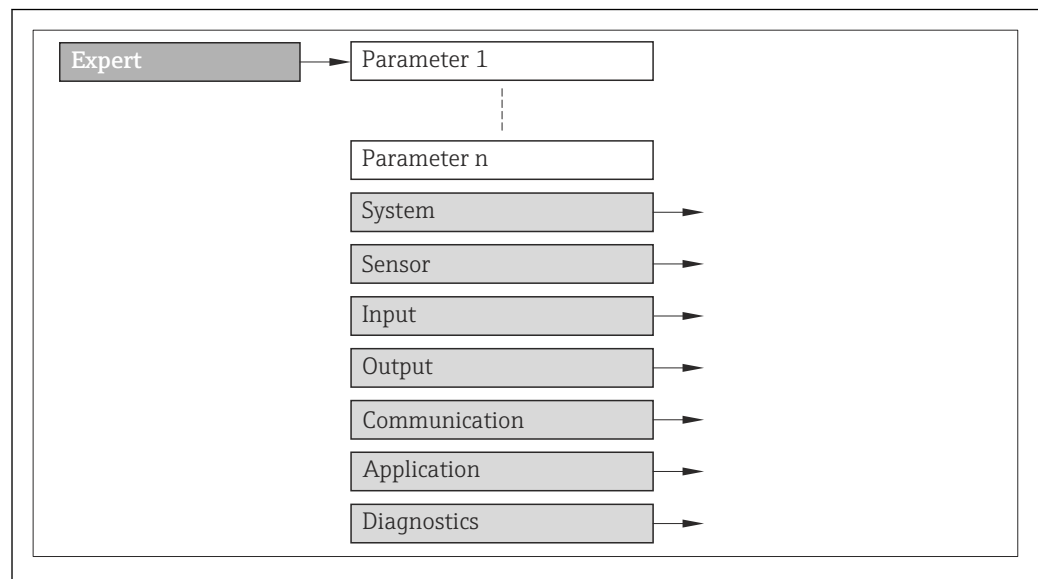
1.2 Target group

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


1.3 Using this document



1.3.1 Information on the document structure

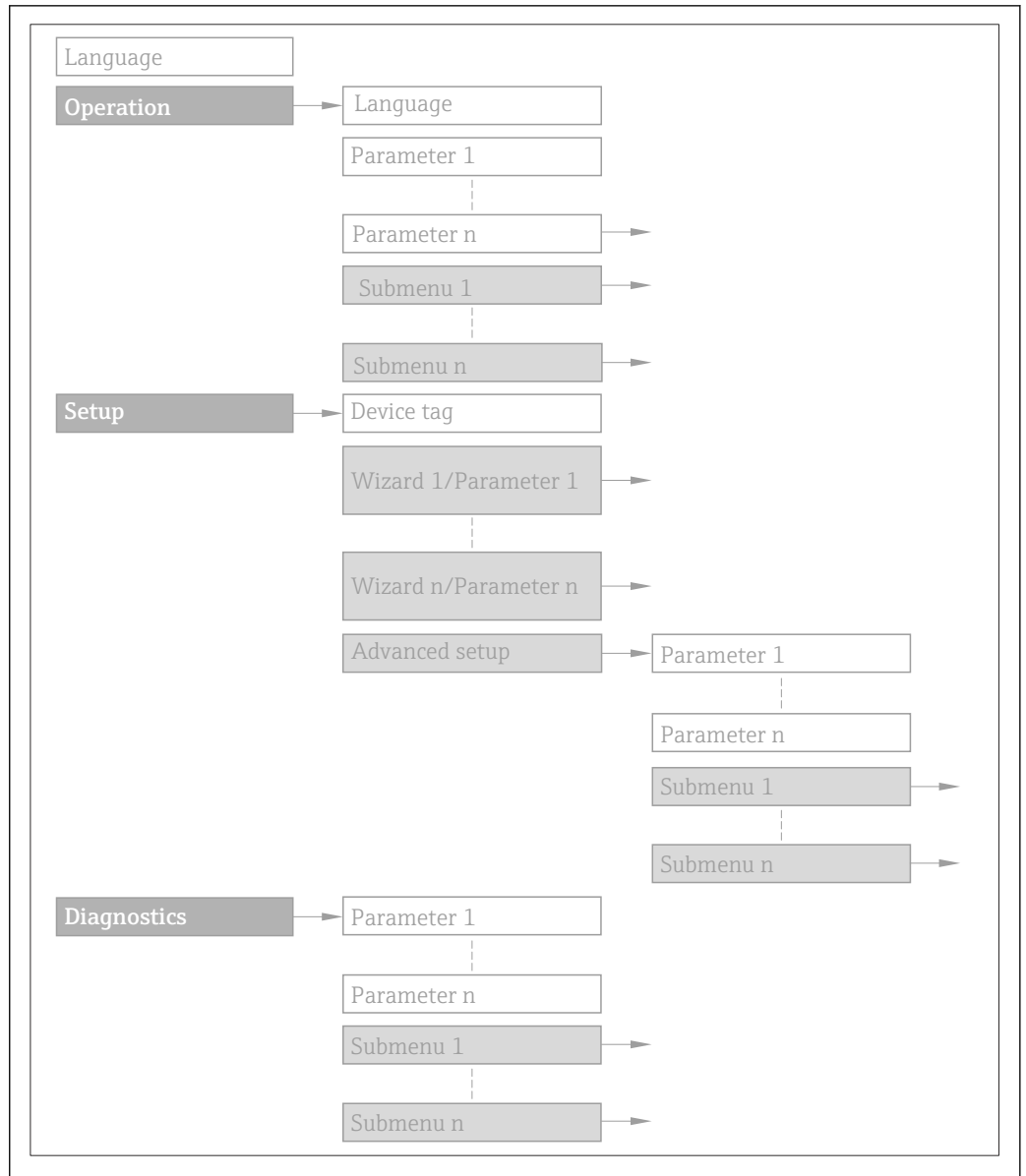
This document lists the submenus and their parameters according to the structure of the **Expert** menu (→  8) menu that are available once the **"Operator" user role** or the **"Maintenance" user role** is enabled.




A0022576-EN

 1 Sample graphic

 For information on the arrangement of the parameters according to the structure of the **Operation** menu, **Setup** menu, **Diagnostics** menu (→  86), along with a brief description, see the Operating Instructions for the device.






2 Sample graphic

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








1.3.2 Structure of a parameter description

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

Complete parameter name	Write-protected parameter = 
Navigation	 Navigation path to the parameter via the local display (direct access code) or Web browser  Navigation path to the parameter via the operating tool The names of the menus, submenus and parameters are abbreviated to the form in which they appear on the display and in the operating tool.
Prerequisite	The parameter is only available under these specific conditions
Description	Description of the parameter function
Selection	List of the individual options for the parameter <ul style="list-style-type: none"> ▪ 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): <ul style="list-style-type: none"> ▪ On individual options ▪ On display values/data ▪ On the input range ▪ On the factory setting ▪ On the parameter function

1.4 Symbols used

1.4.1 Symbols for certain types of information

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

1.4.2 Symbols in graphics

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

2 Overview of the Expert operating menu

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

Expert	
Direct access	→ 10
Locking status	→ 11
Access status display	→ 11
Access status tooling	→ 12
Enter access code	→ 13
▶ System	→ 13
▶ Display	→ 13
▶ Diagnostic handling	→ 26
▶ Administration	→ 30
▶ Sensor	→ 34
▶ Measured values	→ 35
▶ System units	→ 39
▶ Process parameters	→ 51
▶ External compensation	→ 62
▶ Sensor adjustment	→ 65
▶ Calibration	→ 70
▶ Communication	→ 71
▶ Configuration	→ 71

▶ Application	→ 81
Reset all totalizers	→ 81
▶ Totalizer 1 to 3	→ 82
▶ Diagnostics	→ 86
Actual diagnostics	→ 87
Previous diagnostics	→ 88
Operating time from restart	→ 88
Operating time	→ 89
▶ Diagnostic list	→ 89
▶ Event logbook	→ 93
▶ Device information	→ 95
▶ Min/max values	→ 98
▶ Heartbeat	→ 100
▶ Simulation	→ 101

3 Description of device parameters

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

Expert	
Direct access	→ 10
Locking status	→ 11
Access status display	→ 11
Access status tooling	→ 12
Enter access code	→ 13
▶ System	→ 13
▶ Sensor	→ 34
▶ Communication	→ 71
▶ Application	→ 81
▶ Diagnostics	→ 86

Direct access



Navigation

Expert → Direct access

Prerequisite

There is a local display with operating elements.

Description

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

User entry

0 to 65 535

Additional information*User entry*

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



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

Locking status

Navigation

Expert → Locking status

Description

Displays the active write protection.

User interface

- Hardware locked
- Temporarily locked

Additional information*Display*

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



If additional write protection is active, this restricts the current access authorization even further. The write protection status can be viewed via the **Locking status** parameter (→ 11).

"Hardware locked" option (priority 1)

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



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

"Temporarily locked" option (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 status display

Navigation








Expert → Access stat.disp

Prerequisite








A local display is provided.

Description

Displays the access authorization to the parameters via the local display.

User interface	<ul style="list-style-type: none"> ▪ Operator ▪ Maintenance
Factory setting	Operator
Additional information	<p><i>Description</i></p> <p>If the -symbol appears in front of a parameter, it cannot be modified via the local display with the current access authorization.</p> <p> Access authorization can be modified via the Enter access code parameter (→  13).</p> <p> For information on the Enter access code parameter, see the "Disabling write protection via access code" section of the Operating Instructions for the device</p> <p> If additional write protection is active, this restricts the current access authorization even further. The write protection status can be viewed via the Locking status parameter (→  11).</p> <p><i>Display</i></p> <p> Information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device.</p>

Access status tooling

Navigation	  Expert → Access stat.tool
Description	Displays the access authorization to the parameters via the operating tool or Web browser.
User interface	<ul style="list-style-type: none"> ▪ Operator ▪ Maintenance
Factory setting	Maintenance
Additional information	<p><i>Description</i></p> <p> Access authorization can be modified via the Enter access code parameter (→  13).</p> <p> If additional write protection is active, this restricts the current access authorization even further. The write protection status can be viewed via the Locking status parameter (→  11).</p> <p><i>Display</i></p> <p> Information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device.</p>

Enter access code

Navigation	Expert → Ent. access code
Description	Use this function to enter the user-specific release code to remove parameter write protection.
User entry	0 to 9999

3.1 "System" submenu














Navigation Expert → System

▶ System	
▶ Display	→ 13
▶ Diagnostic handling	→ 26
▶ Administration	→ 30

3.1.1 "Display" submenu



Navigation Expert → System → Display

▶ Display	
Display language	→ 14
Format display	→ 15
Value 1 display	→ 17
0% bargraph value 1	→ 17
100% bargraph value 1	→ 18
Decimal places 1	→ 18
Value 2 display	→ 19
Decimal places 2	→ 19
Value 3 display	→ 20

0% bargraph value 3	→  20
100% bargraph value 3	→  21
Decimal places 3	→  21
Value 4 display	→  21
Decimal places 4	→  22
Display interval	→  22
Display damping	→  23
Header	→  23
Header text	→  24
Separator	→  24
Contrast display	→  25
Backlight	→  25
Access status display	→  25

Display language

Navigation

  Expert → System → Display → Display language

Prerequisite

A local display is provided.

Description

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

Selection

- English
- Deutsch *
- Français *
- Español *
- Italiano *
- Nederlands *
- Portuguesa *
- Polski *
- русский язык (Russian) *
- Svenska *
- Türkçe *
- 中文 (Chinese) *
- 日本語 (Japanese) *

* Visibility depends on order options or device settings

- 한국어 (Korean) *
- العربية (Arabic) *
- Bahasa Indonesia *
- ภาษาไทย (Thai) *
- tiếng Việt (Vietnamese) *
- čeština (Czech) *

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

Format display

Navigation  Expert → System → Display → Format display

Prerequisite A local display is provided.

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





Selection

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

Factory setting 1 value, max. size

Additional information *Description*

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

- 
 - The **Value 1 display** parameter (→  17) to **Value 4 display** parameter (→  21) 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 (→  22).

* Visibility depends on order options or device settings

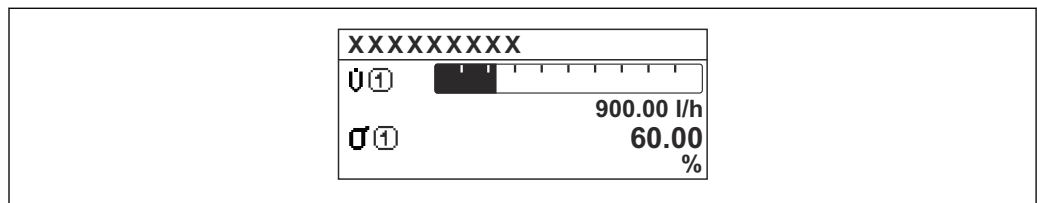
Possible measured values shown on the local display:

"1 value, max. size" option



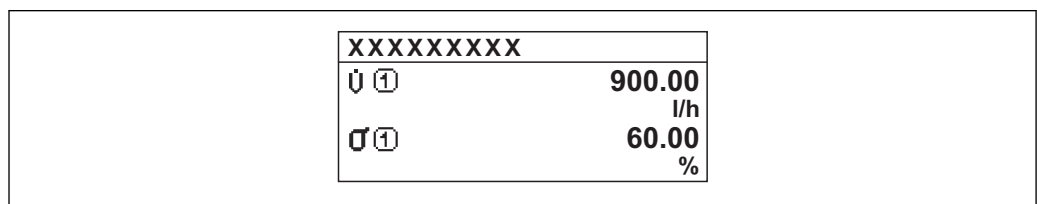
A0016529

"1 bargraph + 1 value" option



A0016530

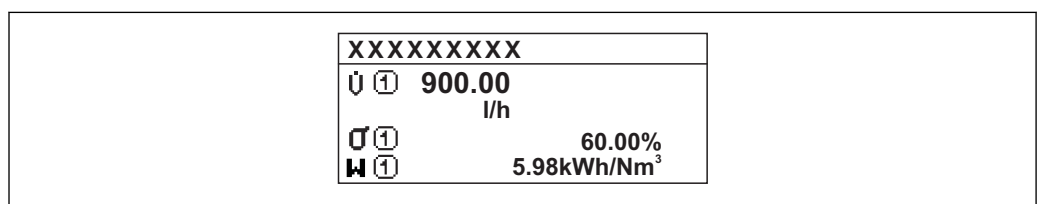
"2 values" option



A0016531

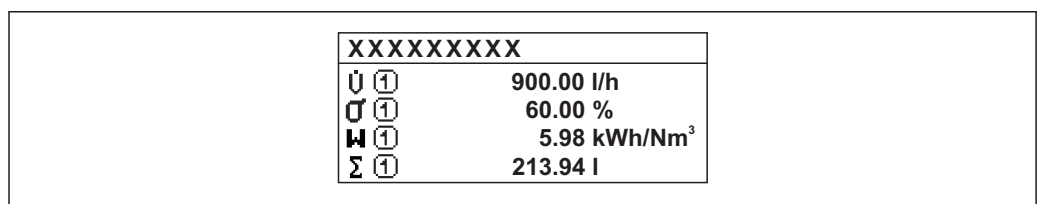
3

"1 value large + 2 values" option













A0016532

"4 values" option





A0016533



Value 1 display 	
Navigation	  Expert → System → Display → Value 1 display
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	<ul style="list-style-type: none"> ■ Volume flow ■ Mass flow ■ Corrected volume flow ■ Flow velocity ■ Conductivity* ■ Corrected conductivity* ■ Temperature* ■ Electronic temperature ■ Totalizer 1 ■ Totalizer 2 ■ Totalizer 3 ■ None
Factory setting	Volume flow
Additional information	<p><i>Description</i></p> <p>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.</p> <p> The Format display parameter (→  15) is used to specify how many measured values are displayed simultaneously and how.</p> <p><i>Selection</i></p> <p> The unit of the displayed measured value is taken from the System units submenu (→  39).</p>
0% bargraph value 1 	
Navigation	  Expert → System → Display → 0% bargraph 1
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: <ul style="list-style-type: none"> ■ 0 l/h ■ 0 gal/min (us)

* Visibility depends on order options or device settings



Additional information*Description*

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

User entry

 The unit of the displayed measured value is taken from the **System units** submenu (→  39).

100% bargraph value 1**Navigation**

  Expert → System → Display → 100% bargraph 1

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 →  104



Additional information*Description*

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

User entry

 The unit of the displayed measured value is taken from the **System units** submenu (→  39).

Decimal places 1**Navigation**

  Expert → System → Display → Decimal places 1

Prerequisite

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

Description













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















Selection

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

Factory setting

x.XX

Additional information	<p><i>Description</i></p> <p> 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.</p>
<hr/>	
Value 2 display	
Navigation	 Expert → System → Display → Value 2 display
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 (→  17)
Factory setting	None
Additional information	<p><i>Description</i></p> <p>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.</p> <p> The Format display parameter (→  15) is used to specify how many measured values are displayed simultaneously and how.</p> <p><i>Selection</i></p> <p> The unit of the displayed measured value is taken from the System units submenu (→  39).</p>
<hr/>	
Decimal places 2	
Navigation	 Expert → System → Display → Decimal places 2
Prerequisite	A measured value is specified in the Value 2 display parameter (→  19).
Description	Use this function to select the number of decimal places for measured value 2.
Selection	<ul style="list-style-type: none"> ■ x ■ x.X ■ x.XX ■ x.XXX ■ x.XXXX
Factory setting	x.XX
Additional information	<p><i>Description</i></p> <p> 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.</p>

Value 3 display 	
Navigation	 Expert → System → Display → Value 3 display
Prerequisite	A local display is provided.
Description	Use this function to select one of the measured values to be shown on the local display.
Selection	Picklist, see Value 1 display parameter (→  17)
Factory setting	None
Additional information	<p><i>Description</i></p> <p>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.</p> <p> The Format display parameter (→  15) is used to specify how many measured values are displayed simultaneously and how.</p> <p><i>Selection</i></p> <p> The unit of the displayed measured value is taken from the System units submenu (→  39).</p>
0% bargraph value 3 	
Navigation	 Expert → System → Display → 0% bargraph 3
Prerequisite	A selection has been made in the Value 3 display parameter (→  20).
Description	Use this function to enter the 0% bar graph value to be shown on the display for the measured value 3.
User entry	Signed floating-point number
Factory setting	Country-specific: <ul style="list-style-type: none"> ▪ 0 l/h ▪ 0 gal/min (us)
Additional information	<p><i>Description</i></p> <p> The Format display parameter (→  15) is used to specify that the measured value is to be displayed as a bar graph.</p> <p><i>User entry</i></p> <p> The unit of the displayed measured value is taken from the System units submenu (→  39).</p>

100% bargraph value 3



Navigation	Expert → System → Display → 100% bargraph 3
Prerequisite	A selection was made in the Value 3 display parameter (→ 20).
Description	Use this function to enter the 100% bar graph value to be shown on the display for the measured value 3.
User entry	Signed floating-point number
Factory setting	0
Additional information	<p><i>Description</i></p> <p> The Format display parameter (→ 15) is used to specify that the measured value is to be displayed as a bar graph.</p> <p><i>User entry</i></p> <p> The unit of the displayed measured value is taken from the System units submenu (→ 39).</p>

Decimal places 3








Navigation	Expert → System → Display → Decimal places 3
Prerequisite	A measured value is specified in the Value 3 display parameter (→ 20).
Description	Use this function to select the number of decimal places for measured value 3.
Selection	<ul style="list-style-type: none"> ■ x ■ x.x ■ x.xx ■ x.xxx ■ x.xxxx
Factory setting	x.xx
Additional information	<p><i>Description</i></p> <p> 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.</p>





Value 4 display





Navigation	Expert → System → Display → Value 4 display
Prerequisite	A local display is provided.





Description	Use this function to select one of the measured values to be shown on the local display.
Selection	Picklist, see Value 1 display parameter (→  17)
Factory setting	None
Additional information	<p><i>Description</i></p> <p>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.</p> <p> The Format display parameter (→  15) is used to specify how many measured values are displayed simultaneously and how.</p> <p><i>Selection</i></p> <p> The unit of the displayed measured value is taken from the System units submenu (→  39).</p>

Decimal places 4



Navigation	  Expert → System → Display → Decimal places 4
Prerequisite	A measured value is specified in the Value 4 display parameter (→  21).
Description	Use this function to select the number of decimal places for measured value 4.
Selection	<ul style="list-style-type: none"> ▪ x ▪ x.x ▪ x.xx ▪ x.xxx ▪ x.xxxx
Factory setting	x.xx
Additional information	<p><i>Description</i></p> <p> 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.</p>

Display interval



Navigation	  Expert → System → Display → Display interval
Prerequisite	A local display is provided.
Description	Use this function to enter the length of time the measured values are displayed if the values alternate on the display.
User entry	1 to 10 s

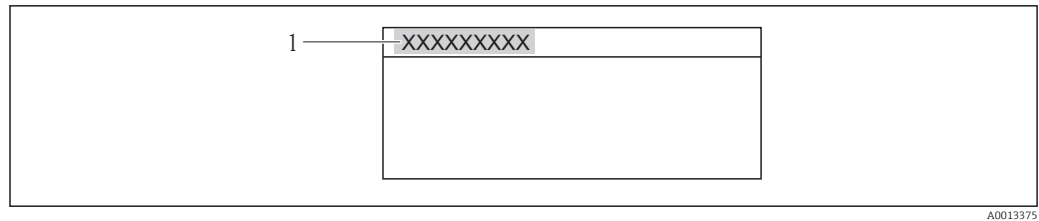
Factory setting	5 s
Additional information	<p><i>Description</i></p> <p>This type of alternating display only occurs automatically if the number of measured values defined exceeds the number of values the selected display format can display simultaneously.</p> <ul style="list-style-type: none">  The Value 1 display parameter (→  17) to Value 4 display parameter (→  21) are used to specify which measured values are shown on the local display. ▪ The display format of the displayed measured values is specified using the Format display parameter (→  15).

Display damping

Navigation	  Expert → System → Display → Display damping
Prerequisite	A local display is provided.
Description	Use this function to enter the reaction time of the local display to fluctuations in the measured value caused by process conditions.
User entry	0.0 to 999.9 s
Factory setting	0.0 s
Additional information	<p><i>User entry</i></p> <p>A time constant is entered:</p> <ul style="list-style-type: none"> ▪ If a low time constant is entered, the display reacts particularly quickly to fluctuating measured variables. ▪ On the other hand, the display reacts more slowly if a high time constant is entered.

Header

Navigation	  Expert → System → Display → Header
Prerequisite	A local display is provided.
Description	Use this function to select the contents of the header of the local display.
Selection	<ul style="list-style-type: none"> ▪ Device tag ▪ Free text
Factory setting	Device tag
Additional information	<p><i>Description</i></p> <p>The header text only appears during normal operation.</p>




A0013375

1 Position of the header text on the display



Selection

Free text


Is defined in the **Header text** parameter (→  24).

Header text

Navigation

  Expert → System → Display → Header text

Prerequisite

The **Free text** option is selected in the **Header** parameter (→  23).

Description

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

User entry

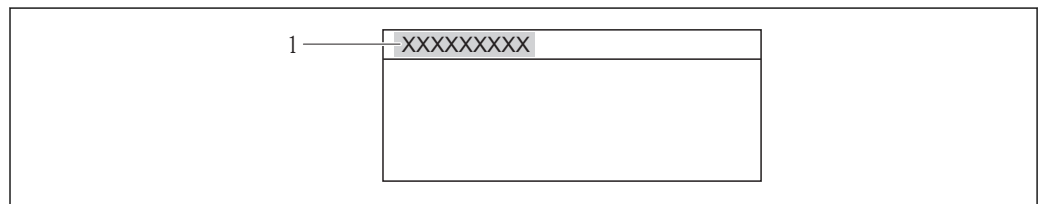
Max. 12 characters such as letters, numbers or special characters (e.g. @, %, /)

Factory setting

Additional information

Description

The header text only appears during normal operation.



A0013375



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

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

Prerequisite A local display is provided.

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

User entry 20 to 80 %

Factory setting Depends on the display

Backlight

Navigation  Expert → System → Display → Backlight

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 Enable

Access status display

Navigation  Expert → System → Display → Access stat.disp


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.

 Access authorization can be modified via the **Enter access code** parameter (→  13).

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

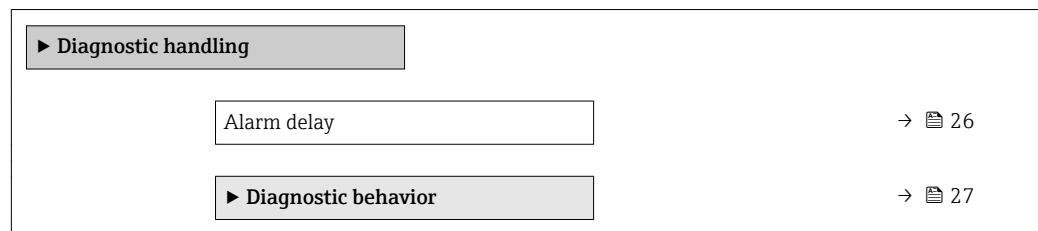
 If additional write protection is active, this restricts the current access authorization even further. The write protection status can be viewed via the **Locking status** parameter (→  11).

Display

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

3.1.2 "Diagnostic handling" submenu


Navigation   Expert → System → Diagn. handling

**Alarm delay****Navigation**

  Expert → System → Diagn. handling → Alarm delay

Description

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

 The diagnostic message is reset without a time delay.

User entry

0 to 60 s

Factory setting

0 s


Additional information*Effect*

This setting affects the following diagnostic messages:



- 190 Special event 1
- 832 Electronic temperature too high
- 833 Electronic temperature too low
- 834 Process temperature too high


- 835 Process temperature too low
- 862 Partly filled pipe
- 990 Special event 4

"Diagnostic behavior" submenu

Each item of diagnostic information is assigned a specific diagnostic behavior at the factory. The user can change this assignment for specific diagnostic information in the **Diagnostic behavior** submenu (→  27).









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

Options	Description
Alarm	The device stops measurement. The totalizers assume the defined alarm condition. A diagnostic message is generated.
Warning	The device continues to measure. The totalizers are not affected. A diagnostic message is generated.
Logbook entry only	The device continues to measure. The diagnostic message is entered only in the Event logbook submenu (→  93) (Event list submenu (→  94)) and is not displayed in alternation with the measured value display.
Off	The diagnostic event is ignored, and no diagnostic message is generated or entered.

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

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

► Diagnostic behavior

- Assign behavior of diagnostic no. 531 →  28
- Assign behavior of diagnostic no. 832 →  28
- Assign behavior of diagnostic no. 833 →  28
- Assign behavior of diagnostic no. 834 →  29
- Assign behavior of diagnostic no. 835 →  29
- Assign behavior of diagnostic no. 862 →  29
- Assign behavior of diagnostic no. 937 →  30
- Assign behavior of diagnostic no. 302 →  30

Assign behavior of diagnostic no. 531 (Empty pipe detection)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 531
Description	Use this function to change the diagnostic behavior of the diagnostic message 531 Empty pipe detection .
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	For a detailed description of the options available, see → 27

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



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 832
Description	Use this function to change the diagnostic behavior of the diagnostic message 832 Electronic temperature too high .
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	For a detailed description of the options available, see → 27

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



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 833
Description	Use this function to change the diagnostic behavior of the diagnostic message 833 Electronic temperature too low .
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	For a detailed description of the options available, see → 27

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

Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 834
Description	Use this function to change the diagnostic behavior of the diagnostic message 834 Process temperature too high .
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	For a detailed description of the options available, see → 27

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

Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 835
Description	Use this function to change the diagnostic behavior of the diagnostic message 835 Process temperature too low .
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	For a detailed description of the options available, see → 27

Assign behavior of diagnostic no. 862 (Empty pipe)

Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 862
Description	Use this function to change the diagnostic behavior of the diagnostic message 862 Empty pipe .
Selection	<ul style="list-style-type: none">▪ Off▪ Alarm▪ Warning▪ Logbook entry only
Factory setting	Warning
Additional information	For a detailed description of the options available, see → 27

Assign behavior of diagnostic no. 937 (EMC interference)


Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 937
Description	Use this function to change the diagnostic behavior of the diagnostic message 937 EMC interference .
Selection	<ul style="list-style-type: none"> ■ Off ■ Alarm ■ Warning ■ Logbook entry only
Factory setting	Warning
Additional information	For a detailed description of the options available, see → 27

Assign behavior of diagnostic no. 302 (Device verification active)




Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 302
Description	Use this function to change the diagnostic behavior of the diagnostic message 302 Device verification active .
Selection	<ul style="list-style-type: none"> ■ Alarm ■ Warning
Factory setting	Warning
Additional information	For a detailed description of the options available, see → 27


3.1.3 "Administration" submenu

Navigation Expert → System → Administration

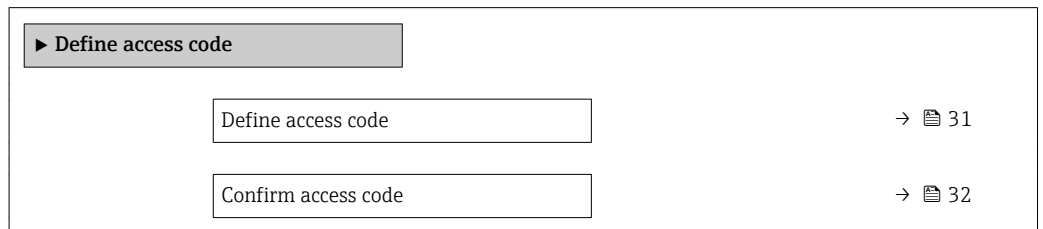
▶ Administration	
▶ Define access code	→ 31
Device reset	→ 33
Activate SW option	→ 33
Software option overview	→ 34

"Define access code" wizard

 The **Define access code** wizard (→  31) is only available when operating via the local display or Web browser.


If operating via the operating tool, the **Define access code** parameter (→  32) can be found directly in the **Administration** submenu. There is no **Confirm access code** parameter if the device is operated via the operating tool.

Navigation  Expert → System → Administration → Def. access code



Define access code





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 or Web browser.

User entry 0 to 9999

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.

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

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

 If you lose the access code, please contact your Endress+Hauser Sales Center.

User entry

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

Factory setting

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





Confirm access code


Navigation	Expert → System → Administration → Def. access code → Confirm code
Description	Enter the defined release code a second time to confirm the release code.
User entry	0 to 9 999
Factory setting	0

Additional parameters in the "Administration" submenu

Define access code


Navigation	Expert → System → Administration → Def. access code
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	<p><i>Description</i></p> <p>The write protection affects all parameters in the document marked with the symbol.</p> <p> Once the access code has been defined, write-protected parameters can only be modified if the access code is entered in the Enter access code parameter (→ 13).</p> <p> If you lose the access code, please contact your Endress+Hauser Sales Center.</p> <p><i>User entry</i></p> <p>A message is displayed if the access code is not in the input range.</p> <p><i>Factory setting</i></p> <p>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.</p>


Device reset	
Navigation	 Expert → System → Administration → Device reset
Description	Use this function to choose whether to reset the device configuration - either entirely or in part - to a defined state.
Selection	<ul style="list-style-type: none"> ■ Cancel ■ To delivery settings ■ Restart device
Factory setting	Cancel
Additional information	<p><i>"Cancel" option</i></p> <p>No action is executed and the user exits the parameter.</p> <p><i>"To delivery settings" option</i></p> <p>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.</p> <p> This option is not visible if no customer-specific settings have been ordered.</p> <p><i>"Restart device" option</i></p> <p>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.</p>
Activate SW option	
Navigation	 Expert → System → Administration → Activate SW opt.
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	0
Additional information	<p><i>User entry</i></p> <p> Endress+Hauser provides the corresponding activation code for the software option with the order.</p> <p>NOTICE! This activation code varies depending on the measuring device and the software option. If an incorrect or invalid code is entered, this can result in the loss of software options that are already been activated. After commissioning the measuring device: in this parameter only enter activation codes which Endress+Hauser has provided (e.g. when a new software option was ordered). If an incorrect or invalid activation code is entered,</p>

enter the activation code from the parameter protocol again and contact your Endress+Hauser sales organization, quoting the serial number of your device.


Example for a software option

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

Web browser





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

Software option overview

Navigation	 Expert → System → Administration → SW option overv.
Description	Displays all the software options that are enabled in the device.
User interface	<ul style="list-style-type: none"> ▪ Electrode cleaning circuit ▪ Heartbeat Verification ▪ Heartbeat Monitoring
Additional information	<p><i>Description</i></p> <p>Displays all the options that are available if ordered by the customer.</p> <p><i>"Electrode cleaning circuit" option</i></p> <p>Order code for "Application package", option EC "ECC electrode cleaning"</p> <p><i>"Heartbeat Verification" option and "Heartbeat Monitoring" option</i></p> <p>Order code for "Application package", option EB "Heartbeat Verification + Monitoring"</p>



3.2 "Sensor" submenu

Navigation  Expert → Sensor

▶ Sensor	
▶ Measured values	→  35
▶ System units	→  39
▶ Process parameters	→  51
▶ External compensation	→  62

▶ Sensor adjustment	→ 65
▶ Calibration	→ 70

3.2.1 "Measured values" submenu

Navigation   Expert → Sensor → Measured val.

▶ Measured values	
▶ Process variables	→ 35
▶ Totalizer	→ 37

"Process variables" submenu

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



▶ Process variables	
Volume flow	→ 35
Mass flow	→ 36
Conductivity	→ 36
Corrected volume flow	→ 36
Temperature	→ 36
Corrected conductivity	→ 37

Volume flow




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

Description Displays the volume flow currently measured.





User interface Signed floating-point number

Additional information *Dependency*
 The unit is taken from the **Volume flow unit** parameter (→  40)




Mass flow

Navigation	 Expert → Sensor → Measured val. → Process variab. → Mass flow
Description	Displays the mass flow currently calculated.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Mass flow unit parameter (→  43)


Conductivity



Navigation	 Expert → Sensor → Measured val. → Process variab. → Conductivity
Prerequisite	In the Conductivity measurement parameter (→  54), the On option is selected.
Description	Displays the conductivity currently measured.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Conductivity unit parameter (→  41)

Corrected volume flow




Navigation	 Expert → Sensor → Measured val. → Process variab. → Correct.vol.flow
Description	Displays the corrected volume flow currently measured.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Corrected volume flow unit parameter (→  45)

Temperature


Navigation	 Expert → Sensor → Measured val. → Process variab. → Temperature
Prerequisite	For the following order code: "Sensor Option", option CI "Fluid temperature probe"



Description	Displays the temperature currently calculated.
User interface	Positive floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Temperature unit parameter (→  42)

Corrected conductivity



Navigation	 Expert → Sensor → Measured val. → Process variab. → CorrConductivity
Prerequisite	One of the following conditions is satisfied: <ul style="list-style-type: none"> ■ Order code for "Sensor Option", option CI "Fluid temperature probe" or ■ The temperature is read into the flowmeter from an external device.
Description	Displays the conductivity currently corrected.
User interface	Positive floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Conductivity unit parameter (→  41)






"Totalizer" submenu

Navigation  Expert → Sensor → Measured val. → Totalizer



▶ Totalizer	
Totalizer value 1 to 3	→  37
Totalizer overflow 1 to 3	→  38

Totalizer value 1 to 3

Navigation	 Expert → Sensor → Measured val. → Totalizer → Totalizer val. 1 to 3
Prerequisite	One of the following options is selected in the Assign process variable parameter (→  82) of the Totalizer 1 to 3 submenu: <ul style="list-style-type: none"> ■ Volume flow ■ Mass flow ■ Corrected volume flow



Description	Displays the current totalizer reading.
User interface	Signed floating-point number
Additional information	<p><i>Description</i></p> <p>As it is only possible to display a maximum of 7 digits in the operating tool, the current counter value is the sum of the totalizer value and the overflow value from the Totalizer overflow 1 to 3 parameter if the display range is exceeded.</p> <p> In the event of an error, the totalizer adopts the mode defined in the Failure mode parameter (→  86).</p> <p><i>User interface</i></p> <p>The value of the process variable totalized since measuring began can be positive or negative. This depends on the settings in the Totalizer operation mode parameter (→  84).</p> <p> The unit of the selected process variable is specified for the totalizer in the Unit totalizer parameter (→  83).</p> <p><i>Example</i></p> <p>Calculation of the current totalizer reading when the value exceeds the 7-digit display range of the operating tool:</p> <ul style="list-style-type: none"> ▪ Value in the Totalizer value 1 parameter: 1 968 457 m³ ▪ Value in the Totalizer overflow 1 parameter: $1 \cdot 10^7$ (1 overflow) = 10 000 000 [m³] ▪ Current totalizer reading: 11 968 457 m³

Totalizer overflow 1 to 3


Navigation	 Expert → Sensor → Measured val. → Totalizer → Tot. overflow 1 to 3
Prerequisite	<p>One of the following options is selected in the Assign process variable parameter (→  82) of the Totalizer 1 to 3 submenu:</p> <ul style="list-style-type: none"> ▪ Volume flow ▪ Mass flow ▪ Corrected volume flow
Description	Displays the current totalizer overflow.
User interface	Integer with sign
Additional information	<p><i>Description</i></p> <p>If the current totalizer reading has more than 7 digits, which is the maximum value range of the operating tool that can be displayed, the value above this range is output as an</p>

overflow. The current totalizer value is therefore the sum of the overflow value and the totalizer value from the **Totalizer value 1 to 3** parameter

Display

 The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→  83).












Example

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

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

3.2.2 "System units" submenu

Navigation   Expert → Sensor → System units

► System units	
Volume flow unit	→  40
Volume unit	→  41
Conductivity unit	→  41
Temperature unit	→  42
Mass flow unit	→  43
Mass unit	→  43
Density unit	→  44
Corrected volume flow unit	→  45
Corrected volume unit	→  46
Date/time format	→  46
► User-specific units	→  47

Volume flow unit



Navigation

Expert → Sensor → System units → Volume flow unit

Description

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

Selection

SI units

- cm³/s
- cm³/min
- cm³/h
- cm³/d
- dm³/s
- dm³/min
- dm³/h
- dm³/d
- m³/s
- m³/min
- m³/h
- m³/d
- ml/s
- ml/min
- ml/h
- ml/d
- l/s
- l/min
- l/h
- l/d
- hl/s
- hl/min
- hl/h
- hl/d
- Ml/s
- Ml/min
- Ml/h
- Ml/d

US units

- af/s
- af/min
- af/h
- af/d
- ft³/s
- ft³/min
- ft³/h
- ft³/d
- fl oz/s (us)
- fl oz/min (us)
- fl oz/h (us)
- fl oz/d (us)
- gal/s (us)
- gal/min (us)
- gal/h (us)
- gal/d (us)
- kgal/s (us)
- kgal/min (us)
- kgal/h (us)
- kgal/d (us)
- Mgal/s (us)
- Mgal/min (us)
- Mgal/h (us)
- Mgal/d (us)
- bbl/s (us;liq.)
- bbl/min (us;liq.)
- bbl/h (us;liq.)
- bbl/d (us;liq.)
- bbl/s (us;beer)
- bbl/min (us;beer)
- bbl/h (us;beer)
- bbl/d (us;beer)
- bbl/s (us;oil)
- bbl/min (us;oil)
- bbl/h (us;oil)
- bbl/d (us;oil)
- bbl/s (us;tank)
- bbl/min (us;tank)
- bbl/h (us;tank)
- bbl/d (us;tank)

Imperial units

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

Custom-specific units


- User vol./s
- User vol./min
- User vol./h
- User vol./d

Factory setting


Country-specific:

- l/h
- gal/min (us)



Additional information*Result*

The selected unit applies for:
Volume flow parameter (→  35)


Selection

 For an explanation of the abbreviated units: →  108

Customer-specific units

 The unit for the customer-specific volume is specified in the **User volume text** parameter (→  47).

Volume unit**Navigation**

  Expert → Sensor → System units → Volume unit

Description

Use this function to select the unit for the volume.

Selection*SI units*

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

US units

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

Imperial units

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

Custom-specific units

User vol.

Factory setting

Country-specific:

- m³
- gal (us)

Additional information*Selection*

 For an explanation of the abbreviated units: →  108

Customer-specific units

 The unit for the customer-specific volume is specified in the **User volume text** parameter (→  47).

Conductivity unit**Navigation**

  Expert → Sensor → System units → Conductiv. unit

Prerequisite

In the **Conductivity measurement** parameter (→  54), the **On** option is selected.

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

Selection



SI units

- nS/cm
- μ S/cm
- μ S/m
- μ S/mm
- mS/m
- mS/cm
- S/cm
- S/m
- kS/m
- MS/m


Factory setting μ S/cm

Additional information *Result*



The selected unit applies for:

- **Conductivity** parameter (→  36)
- **Corrected conductivity** parameter (→  37)

Selection

 For an explanation of the abbreviated units: →  108

Temperature unit

Navigation   Expert → Sensor → System units → Temperature unit

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

Selection







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

Factory setting Country-specific:


- °C
- °F

Additional information *Result*

The selected unit applies for:

- **Temperature** parameter (→  36)
- **Maximum value** parameter (→  99)
- **Minimum value** parameter (→  99)
- **External temperature** parameter (→  63)
- **Maximum value** parameter (→  100)
- **Minimum value** parameter (→  100)

Selection

 For an explanation of the abbreviated units: →  108

Mass flow unit



Navigation Expert → Sensor → System units → Mass flow unit

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

Selection

<p><i>SI units</i></p> <ul style="list-style-type: none"> ■ g/s ■ g/min ■ g/h ■ g/d ■ kg/s ■ kg/min ■ kg/h ■ kg/d ■ t/s ■ t/min ■ t/h ■ t/d 	<p><i>US units</i></p> <ul style="list-style-type: none"> ■ oz/s ■ oz/min ■ oz/h ■ oz/d ■ lb/s ■ lb/min ■ lb/h ■ lb/d ■ STon/s ■ STon/min ■ STon/h ■ STon/d
<p><i>Custom-specific units</i></p> <ul style="list-style-type: none"> ■ User mass/s ■ User mass/min ■ User mass/h ■ User mass/d 	

Factory setting Country-specific:

- kg/h
- lb/min

Additional information *Result*

The selected unit applies for:
Mass flow parameter (→ 36)

Selection

For an explanation of the abbreviated units: → 108

Customer-specific units





The unit for the customer-specific mass is specified in the **User mass text** parameter (→ 48).

Mass unit



Navigation Expert → Sensor → System units → Mass unit

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

Selection	<i>SI units</i> <ul style="list-style-type: none"> ▪ g ▪ kg ▪ t <i>Custom-specific units</i> User mass	<i>US units</i> <ul style="list-style-type: none"> ▪ oz ▪ lb ▪ STon
Factory setting	Country-specific: <ul style="list-style-type: none"> ▪ kg ▪ lb 	
Additional information	<i>Selection</i>  For an explanation of the abbreviated units: →  108 <i>Customer-specific units</i>  The unit for the customer-specific mass is specified in the User mass text parameter (→  48).	

Density unit




Navigation  Expert → Sensor → System units → Density unit

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

Selection	<i>SI units</i> <ul style="list-style-type: none"> ▪ g/cm³ ▪ g/m³ ▪ kg/dm³ ▪ kg/l ▪ kg/m³ ▪ SD4°C ▪ SD15°C ▪ SD20°C ▪ SG4°C ▪ SG15°C ▪ SG20°C 	<i>US units</i> <ul style="list-style-type: none"> ▪ lb/ft³ ▪ lb/gal (us) ▪ lb/bbl (us;liq.) ▪ lb/bbl (us;beer) ▪ lb/bbl (us;oil) ▪ lb/bbl (us;tank) 	<i>Imperial units</i> <ul style="list-style-type: none"> ▪ lb/gal (imp) ▪ lb/bbl (imp;beer) ▪ lb/bbl (imp;oil)
Factory setting	Country-specific: <ul style="list-style-type: none"> ▪ kg/l ▪ lb/ft³ 		

Additional information*Result*

The selected unit applies for:

- **External density** parameter (→  64)
- **Fixed density** parameter (→  64)

Selection


- SD = 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).

- SG = 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).



For an explanation of the abbreviated units: →  108

Corrected volume flow unit**Navigation**

  Expert → Sensor → System units → Cor.volflow unit

Description

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

Selection*SI units*

- NI/s
- NI/min
- NI/h
- NI/d
- Nm³/s
- Nm³/min
- Nm³/h
- Nm³/d
- Sm³/s
- Sm³/min
- Sm³/h
- Sm³/d

US units

- Sft³/s
- Sft³/min
- Sft³/h
- Sft³/d
- Sgal/s (us)
- Sgal/min (us)
- Sgal/h (us)
- Sgal/d (us)
- Sbbbl/s (us;liq.)
- Sbbbl/min (us;liq.)
- Sbbbl/h (us;liq.)
- Sbbbl/d (us;liq.)
- Sgal/s (imp)
- Sgal/min (imp)
- Sgal/h (imp)
- Sgal/d (imp)






Custom-specific units

- UserCrVol./s
- UserCrVol./min
- UserCrVol./h
- UserCrVol./d







Factory setting

Country-specific:



- NI/h
- Sft³/h

Additional information	<p><i>Result</i></p> <p>The selected unit applies for: Corrected volume flow parameter (→  36)</p> <p><i>Selection</i></p> <p> For an explanation of the abbreviated units: →  108</p> <p><i>Customer-specific units</i></p> <p> The unit for the customer-specific corrected volume is defined in the User corrected volume text parameter (→  50).</p>
-------------------------------	---



Corrected volume unit

Navigation	  Expert → Sensor → System units → Corr. vol. unit						
Description	Use this function to select the unit for the corrected volume.						
Selection	<table> <thead> <tr> <th><i>SI units</i></th> <th><i>US units</i></th> <th><i>Imperial units</i></th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> ■ NI ■ Nm³ ■ Sm³ </td> <td> <ul style="list-style-type: none"> ■ Sft³ ■ Sgal (us) ■ Sbbl (us;liq.) </td> <td> <ul style="list-style-type: none"> ■ Sgal (imp) </td> </tr> </tbody> </table> <p><i>Custom-specific units</i> UserCrVol.</p>	<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>	<ul style="list-style-type: none"> ■ NI ■ Nm³ ■ Sm³ 	<ul style="list-style-type: none"> ■ Sft³ ■ Sgal (us) ■ Sbbl (us;liq.) 	<ul style="list-style-type: none"> ■ Sgal (imp)
<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>					
<ul style="list-style-type: none"> ■ NI ■ Nm³ ■ Sm³ 	<ul style="list-style-type: none"> ■ Sft³ ■ Sgal (us) ■ Sbbl (us;liq.) 	<ul style="list-style-type: none"> ■ Sgal (imp) 					
Factory setting	Country-specific: <ul style="list-style-type: none"> ■ Nm³ ■ Sft³ 						
Additional information	<p><i>Selection</i></p> <p> For an explanation of the abbreviated units: →  108</p> <p><i>Customer-specific units</i></p> <p> The unit for the customer-specific corrected volume is defined in the User corrected volume text parameter (→  50).</p>						

Date/time format










Navigation	  Expert → Sensor → System units → Date/time format
Description	Use this function to select the desired time format for calibration history.
Selection	<ul style="list-style-type: none"> ■ dd.mm.yy hh:mm ■ dd.mm.yy hh:mm am/pm ■ mm/dd/yy hh:mm ■ mm/dd/yy hh:mm am/pm
Factory setting	dd.mm.yy hh:mm

Additional information*Selection*


 For an explanation of the abbreviated units: →  108

"User-specific units" submenu*Navigation*

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

► User-specific units	
User volume text	→  47
User volume offset	→  48
User volume factor	→  48
User mass text	→  48
User mass offset	→  49
User mass factor	→  49
User corrected volume text	→  50
User corrected volume offset	→  50
User corrected volume factor	→  50

User volume text**Navigation**

  Expert → Sensor → System units → User-spec. units → Volume text

Description




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

User entry


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

Factory setting

User vol.




Additional information	<p><i>Result</i></p> <p> The defined unit is shown as an option in the choose list of the following parameters:</p> <ul style="list-style-type: none"> ▪ Volume flow unit parameter (→  40) ▪ Volume unit parameter (→  41)
-------------------------------	--

Example



If the text GLAS is entered, the choose list of the **Volume flow unit** parameter (→  40) shows the following options:

- GLAS/s
- GLAS/min
- GLAS/h
- GLAS/d



User volume offset












Navigation	  Expert → Sensor → System units → User-spec. units → Volume offset
Description	Use this function to enter the offset for adapting the user-specific volume unit and volume flow unit (without time).
User entry	Signed floating-point number
Factory setting	0
Additional information	<p><i>Description</i></p> <p> Value in user-specific unit = (factor × value in base unit) + offset</p>

User volume factor







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

User mass text




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

User entry	Max. 10 characters such as letters, numbers or special characters (@, %, /)
Factory setting	User mass
Additional information	<p><i>Result</i></p> <p> The defined unit is shown as an option in the choose list of the following parameters:</p> <ul style="list-style-type: none"> ▪ Mass flow unit parameter (→  43) ▪ Mass unit parameter (→  43) <p><i>Example</i></p> <p>If the text GLAS is entered, the following options are displayed in the picklist for the Mass flow unit parameter (→  43):</p> <ul style="list-style-type: none"> ▪ GLAS/s ▪ GLAS/min ▪ GLAS/h ▪ GLAS/d
<hr/>	
User mass offset	
Navigation	  Expert → Sensor → System units → User-spec. units → Mass offset
Description	Use this function to enter the offset for adapting the user-specific mass unit and mass flow unit (without time).
User entry	Signed floating-point number
Factory setting	0
Additional information	<p><i>Description</i></p> <p> Value in user-specific unit = (factor × value in base unit) + offset</p>
<hr/>	
User mass factor	
Navigation	  Expert → Sensor → System units → User-spec. units → Mass factor
Description	Use this function to enter a quantity factor (without time) for the user-specific mass and mass flow unit.
User entry	Signed floating-point number
Factory setting	1.0



User corrected volume text 

Navigation	  Expert → Sensor → System units → User-spec. units → Corr. vol. text
Description	Use this function to enter a text for the user-specific unit of the corrected volume and corrected volume flow. The corresponding time units (s, min, h, d) for mass flow are generated automatically.
User entry	Max. 10 characters such as letters, numbers or special characters (@, %, /)
Factory setting	UserCrVol.
Additional information	<p><i>Result</i></p> <p> The defined unit is shown as an option in the choose list of the following parameters:</p> <ul style="list-style-type: none"> ▪ Corrected volume flow unit parameter (→  45) ▪ Corrected volume unit parameter (→  46) <p><i>Example</i></p> <p>If the text GLAS is entered, the choose list of the Corrected volume flow unit parameter (→  45) shows the following options:</p> <ul style="list-style-type: none"> ▪ GLAS/s ▪ GLAS/min ▪ GLAS/h ▪ GLAS/d

User corrected volume offset 

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

User corrected volume factor 

Navigation	  Expert → Sensor → System units → User-spec. units → Cor.vol. factor
Description	Use this function to enter a quantity factor (without time) for the user-specific corrected volume unit and corrected volume flow unit.
User entry	Signed floating-point number


Factory setting 1.0

3.2.3 "Process parameters" submenu

Navigation  Expert → Sensor → Process param.

► Process parameters	
Filter options	→ 51
Flow damping	→ 53
Flow override	→ 53
Conductivity damping	→ 54
Temperature damping	→ 54
Conductivity measurement	→ 54
► Low flow cut off	→ 55
► Empty pipe detection	→ 58
► Electrode cleaning circuit	→ 60

Filter options

Navigation  Expert → Sensor → Process param. → Filter options

Description Use this function to select a filter option.

- Selection**
- Standard CIP off
 - Standard CIP on
 - Dynamic CIP off
 - Dynamic CIP on
 - Binomial filter

Factory setting Standard CIP off

Additional information *Description*

The user can choose from a range of filter combinations which can optimize the measurement result depending on the application. Each change in the filter setting affects

the output signal of the measuring device. The response time of the output signal increases as the filter depth increases.

Selection

■ Standard

- Strong flow damping with a short output signal response time.
- Some time is needed before a stable output signal can be generated.
- Not suitable for pulsating flow as the average flow can be different here.

■ Dynamic

- Average flow damping with a delayed output signal response time.
- The average flow is displayed correctly over a measuring interval determined over a long period.

■ Binominal

- Weak flow damping with a short output signal response time.
- The average flow is displayed correctly over a measuring interval determined over a long period.

■ CIP

- This filter is also available for the **Standard** and **Dynamic** filter options.
- If the CIP filter has detected a change in the medium (abrupt increase in the noise level, e.g. quickly changing medium conductivity values during CIP cleaning), flow damping is greatly increased and the raw value (before flow damping) is limited by the mean value (delimiter). This eliminates extremely high measured errors (up to several 100 m/s).
- If the CIP filter is enabled, the response time of the entire measuring system increases and the output signal is delayed accordingly.

Examples

Possible applications for the filters

Application	Standard	Standard CIP	Dynamic	Dynamic CIP	Binomial
Pulsating flow (flow is negative intermittently)	---	---	++	--	++
Flow changes frequently (flow is dynamic)	-	--	++	-	++
Clear signal, quick control loop (< 1 s)	--	--	+ ¹⁾		++
Poor signal, slow control loop (response time of a few seconds)	++	-	--	---	---
Permanently bad signal	++	--	-	---	-
Short and severe signal distortion after a while		++		++	
Promag 50/53 replacement: Promag 100 system damping = 0.5 * Promag 50/53					+++
Promag 10 replacement: Promag 100 system damping = Promag 10 + 2			+++		
For a stable flow signal (no other requirements)	+++				

1) Flow damping value < 6

Flow damping


Navigation	Expert → Sensor → Process param. → Flow damping
Description	Use this function to enter flow damping. Reduction of the variability of the flow measured value (in relation to interference). For this purpose, the depth of the flow filter is adjusted: when the filter setting increases, the reaction time of the device also increases.
User entry	0 to 15
Factory setting	7
Additional information	<p><i>User entry</i></p> <ul style="list-style-type: none"> ▪ Value = 0: no damping ▪ Value > 0: damping is increased <p> ▪ 0 is a weak damping and 15 a strong one.</p> <ul style="list-style-type: none"> ▪ A damping of 0 is not recommended, as the measuring signal is then so noisy that it is almost impossible to carry out a measurement. ▪ The damping depends on the measuring period and the filter type selected. ▪ An increase or decrease in the damping depends on the application. <p><i>Effect</i></p> <p> The damping affects the following variables of the device:</p> <ul style="list-style-type: none"> ▪ Outputs ▪ Low flow cut off → 55 ▪ Totalizers → 82

Flow override


Navigation	Expert → Sensor → Process param. → Flow override
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	<ul style="list-style-type: none"> ▪ Off ▪ On
Factory setting	Off
Additional information	<p><i>Result</i></p> <p> This setting affects all the functions and outputs of the measuring device.</p> <p><i>Description</i></p> <p>Flow override is active</p> <ul style="list-style-type: none"> ▪ The diagnostic message diagnostic message C453 Flow override is displayed. ▪ Output values <ul style="list-style-type: none"> – Output: Value at zero flow – Temperature: proceeding output – Totalizers 1-3: Stop being totalized

Conductivity damping



Navigation	Expert → Sensor → Process param. → Conduct. damping
Prerequisite	In the Conductivity measurement parameter (→ 54), the On option is selected.
Description	Use this function to enter the time constant for conductivity damping.
User entry	0 to 999.9 s
Factory setting	0 s

Temperature damping





Navigation	Expert → Sensor → Process param. → Temp. damping
Prerequisite	For the following order code: "Sensor Option", option CI "Fluid temperature probe"
Description	Use this function to enter the time constant for temperature damping.
User entry	0 to 999.9 s
Factory setting	0 s





Conductivity measurement





Navigation	Expert → Sensor → Process param. → Conduct. measur.
Description	Use this function to enable and disable conductivity measurement.
Selection	<ul style="list-style-type: none"> ▪ Off ▪ On
Factory setting	Off
Additional information	<p><i>Description</i></p> <p> For conductivity measurement to work, the medium must have a minimum conductivity of 5 µS/cm.</p>

"Low flow cut off" submenu








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

▶ Low flow cut off	
Assign process variable	→  55
On value low flow cutoff	→  55
Off value low flow cutoff	→  56
Pressure shock suppression	→  56

Assign process variable

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

On value low flow cutoff

Navigation	  Expert → Sensor → Process param. → Low flow cut off → On value
Prerequisite	One of the following options is selected in the Assign process variable parameter (→  55): <ul style="list-style-type: none"> ▪ Volume flow ▪ Mass flow ▪ Corrected volume flow
Description	Use this function to enter a switch-on value for low flow cut off. Low flow cut off is activated if the value entered is not equal to 0 →  56.
User entry	Signed floating-point number
Factory setting	Depends on country and nominal diameter →  105
Additional information	<p><i>Dependency</i></p> <p> The unit depends on the process variable selected in the Assign process variable parameter (→  55).</p>

Off value low flow cutoff
**Navigation**

Expert → Sensor → Process param. → Low flow cut off → Off value

Prerequisite

One of the following options is selected in the **Assign process variable** parameter (→ 55):

- Volume flow
- Mass flow
- Corrected volume flow

Description

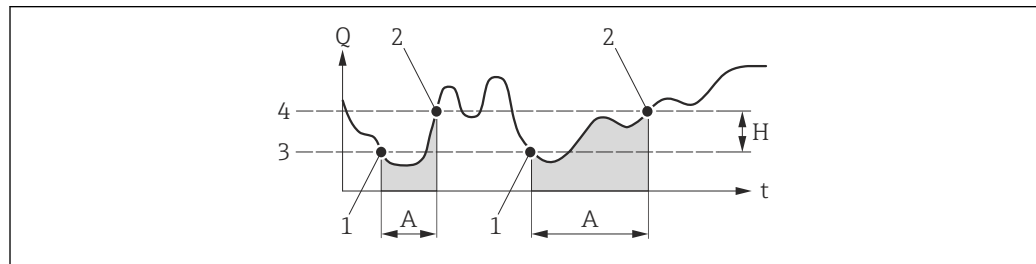
Use this function to enter a switch-off value for low flow cut off. The off value is entered as a positive hysteresis from the on value → 55.

User entry

0 to 100.0 %

Factory setting

50 %

Additional information*Example*

A0012887

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

Pressure shock suppression
**Navigation**

Expert → Sensor → Process param. → Low flow cut off → Pres. shock sup.

Prerequisite

One of the following options is selected in the **Assign process variable** parameter (→ 55):

- Volume flow
- Mass flow
- Corrected volume flow

Description

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

User entry

0 to 100 s

Factory setting

0 s

Additional information*Description***Pressure shock suppression is enabled**

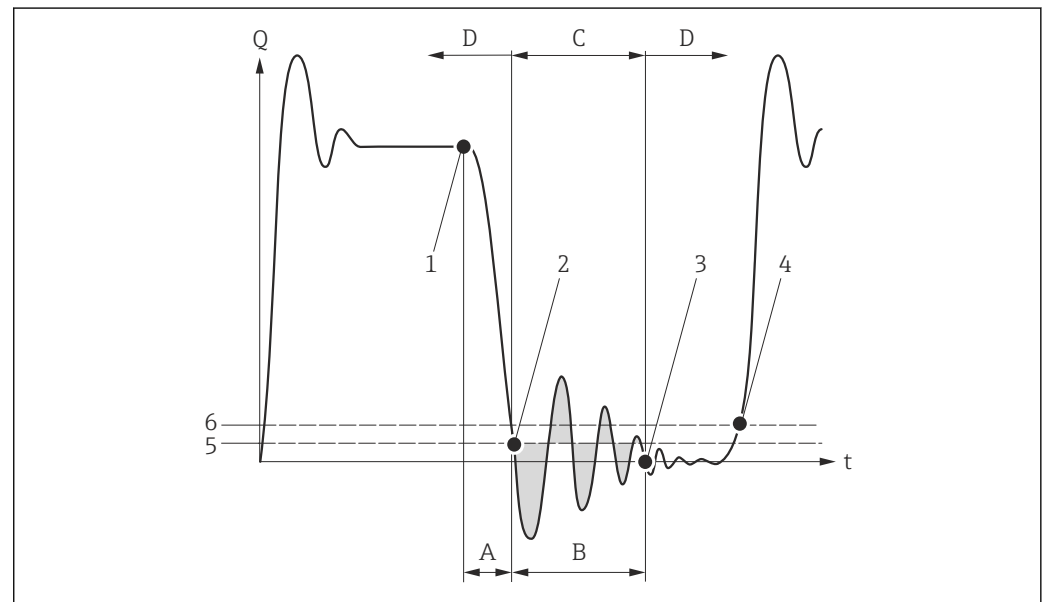
- Prerequisite:
Flow rate < on-value of low flow cut off
- Output values
 - Flow displayed: 0
 - Totalizer: the totalizers are pegged at the last correct value

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.











A0012888


- 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

"Empty pipe detection" submenu



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

► Empty pipe detection	
Empty pipe detection	→  58
Switch point empty pipe detection	→  58
Response time empty pipe detection	→  59
New adjustment	→  59
Progress	→  59
Empty pipe adjust value	→  60
Full pipe adjust value	→  60
Measured value EPD	→  60

Empty pipe detection

Navigation	 Expert → Sensor → Process param. → Empty pipe det. → Empty pipe det.
Description	Use this function to switch empty pipe detection on and off.
Selection	<ul style="list-style-type: none"> ■ Off ■ On
Factory setting	Off

Switch point empty pipe detection

Navigation	 Expert → Sensor → Process param. → Empty pipe det. → Switch point EPD
Prerequisite	The On option is selected in the Empty pipe detection parameter (→  58).
Description	Use this function to enter the percentage threshold value of the resistance in relation to the adjustment values.
User entry	0 to 100 %
Factory setting	10 %

Response time empty pipe detection


Navigation	Expert → Sensor → Process param. → Empty pipe det. → Response time
Prerequisite	In the Empty pipe detection parameter (→ 58), the On option is selected.
Description	Enter the minimum length of time (debouncing time) the signal must be present for the diagnostic message △S862 Empty pipe to be triggered if the measuring pipe is empty or partially full.
User entry	0 to 100 s
Factory setting	1 s

New adjustment


Navigation	Expert → Sensor → Process param. → Empty pipe det. → New adjustment
Prerequisite	The On option is selected in the Empty pipe detection parameter (→ 58).
Description	For selecting whether to perform an empty pipe or full pipe adjustment.
Selection	<ul style="list-style-type: none"> ■ Cancel ■ Empty pipe adjust ■ Full pipe adjust
Factory setting	Cancel

Progress

Navigation	Expert → Sensor → Process param. → Empty pipe det. → Progress
Prerequisite	The On option is selected in the Empty pipe detection parameter (→ 58).
Description	Use this function to view the progress.
User interface	<ul style="list-style-type: none"> ■ Ok ■ Busy ■ Not ok

Empty pipe adjust value

Navigation	Expert → Sensor → Process param. → Empty pipe det. → Empty pipe value
Prerequisite	<ul style="list-style-type: none"> ▪ In the Empty pipe detection parameter (→ 58), the On option is selected. ▪ Adjustment value > full pipe value.
Description	Displays the adjustment value when the measuring pipe is empty.
User interface	Positive floating-point number

Full pipe adjust value

Navigation	Expert → Sensor → Process param. → Empty pipe det. → Full pipe value
Prerequisite	<ul style="list-style-type: none"> ▪ In the Empty pipe detection parameter (→ 58), the On option is selected. ▪ Adjustment value < empty pipe value.
Description	Displays the adjustment value when the measuring pipe is full.
User interface	Positive floating-point number

Measured value EPD

Navigation	Expert → Sensor → Process param. → Empty pipe det. → Meas. value EPD
Prerequisite	In the Empty pipe detection parameter (→ 58), the On option is selected.
Description	Displays the current measured value.
User interface	Positive floating-point number

"Electrode cleaning circuit" submenu

Navigation Expert → Sensor → Process param. → ECC

▶ Electrode cleaning circuit	
Electrode cleaning circuit	→ 61
ECC duration	→ 61
ECC recovery time	→ 61

ECC cleaning cycle	→ 62
ECC Polarity	→ 62

Electrode cleaning circuit


Navigation Expert → Sensor → Process param. → ECC → ECC

Prerequisite For the following order code:
"Application package", option EC "ECC electrode cleaning"

Description Use this function to enable and disable cyclic electrode cleaning.

Selection

- Off
- On

Factory setting Off

ECC duration


Navigation Expert → Sensor → Process param. → ECC → ECC duration

Prerequisite For the following order code:
"Application package", option EC "ECC electrode cleaning"

Description Use this function to enter the duration of electrode cleaning in seconds.

User entry 0.01 to 30 s

Factory setting 2 s

ECC recovery time


Navigation Expert → Sensor → Process param. → ECC → ECC recov. time

Prerequisite For the following order code:
"Application package", option EC "ECC electrode cleaning"

Description Use this function to enter the recovery time after electrode cleaning to prevent signal output interference. The current output values are frozen in the meanwhile.

User entry Positive floating-point number

Factory setting 60 s

ECC cleaning cycle

Navigation	Expert → Sensor → Process param. → ECC → ECC clean. cycle
Prerequisite	For the following order code: "Application package", option EC "ECC electrode cleaning"
Description	Use this function to enter the pause duration until the next electrode cleaning.
User entry	0.5 to 168 h
Factory setting	0.5 h

ECC Polarity

Navigation	Expert → Sensor → Process param. → ECC → ECC Polarity
Prerequisite	For the following order code: "Application package", option EC "ECC electrode cleaning"
Description	Displays the polarity of the electrode cleaning circuit.
User interface	<ul style="list-style-type: none"> ■ Positive ■ Negative
Factory setting	Depends on the electrode material: <ul style="list-style-type: none"> ■ Platinum: Negative option ■ Tantalum, Alloy C22, stainless steel: Positive option



3.2.4 "External compensation" submenu

Navigation Expert → Sensor → External comp.






► External compensation	
Temperature source	→ 63
External temperature	→ 63
Density source	→ 63
External density	→ 64

Fixed density	→ 64
Reference density	→ 64



Temperature source

Navigation	  Expert → Sensor → External comp. → Temp. source
Description	Use this function to select the temperature source.
Selection	<ul style="list-style-type: none"> ■ Internal temperature sensor ■ External value
Factory setting	External value





External temperature

Navigation	  Expert → Sensor → External comp. → External temp.
Prerequisite	The External value option is selected in the Temperature source parameter (→  63).
Description	Displays the temperature read in by the external device.
User interface	Floating point number with sign
Additional information	<p><i>Dependency</i></p> <p> The unit is taken from the Temperature unit parameter (→  42)</p>

Density source




Navigation	  Expert → Sensor → External comp. → Density source
Description	Use this function to select the density source.
Selection	<ul style="list-style-type: none"> ■ Fixed density ■ External density
Factory setting	Fixed density

External density


Navigation	 Expert → Sensor → External comp. → External density
Prerequisite	In the Density source parameter (→  63), the External density option is selected.
Description	Displays the density read in from the external device.
User interface	Positive floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Density unit parameter (→  44)




Fixed density



Navigation	 Expert → Sensor → External comp. → Fixed density
Description	Use this function to enter a fixed value for the density.
User entry	Positive floating-point number
Factory setting	Country-specific: <ul style="list-style-type: none"> ▪ 1 000 kg/l ▪ 1 000 lb/ft³
Additional information	<i>Dependency</i>  The unit is taken from the Density unit parameter (→  44)





Reference density





Navigation	 Expert → Sensor → External comp. → Ref.density
Description	Use this function to enter a fixed value for the reference density.
User entry	Positive floating-point number
Factory setting	Country-specific: <ul style="list-style-type: none"> ▪ 1 kg/l ▪ 1 lb/ft³
Additional information	<i>Dependency</i>  The unit is taken from the Density unit parameter (→  44)

3.2.5 "Sensor adjustment" submenu


Navigation  Expert → Sensor → Sensor adjustm.

▶ Sensor adjustment		
Installation direction		→  65
Integration time		→  65
Measuring period		→  65
▶ Process variable adjustment		→  66


Installation direction

Navigation	 Expert → Sensor → Sensor adjustm. → Install. direct.
Description	Use this function to change the sign of the medium flow direction.
Selection	<ul style="list-style-type: none"> ■ Flow in arrow direction ■ Flow against arrow direction
Factory setting	Flow in arrow direction
Additional information	<p><i>Description</i></p> <p> Before changing the sign: ascertain the actual direction of fluid flow with reference to the direction indicated by the arrow on the sensor nameplate.</p>

Integration time


Navigation	 Expert → Sensor → Sensor adjustm. → Integration time
Description	Display the duration of an integration cycle.
User interface	1 to 65 ms











Measuring period

Navigation	 Expert → Sensor → Sensor adjustm. → Measuring period
Description	Display the time of a full measuring period.


User interface 50 to 1 000 ms

"Process variable adjustment" submenu

Navigation  Expert → Sensor → Sensor adjustm. → Variable adjust

▶ Process variable adjustment	
Volume flow offset	→  66
Volume flow factor	→  67
Mass flow offset	→  67
Mass flow factor	→  67
Conductivity offset	→  68
Conductivity factor	→  68
Corrected volume flow offset	→  68
Corrected volume flow factor	→  69
Temperature offset	→  69
Temperature factor	→  69

Volume flow offset


Navigation  Expert → Sensor → Sensor adjustm. → Variable adjust → Vol. flow offset

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

User entry Signed floating-point number

Factory setting 0 m³/s

Additional information *Description*

 Corrected value = (factor × value) + offset

Volume flow factor



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

Mass flow offset






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

Mass flow factor






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



Conductivity offset 

Navigation	 Expert → Sensor → Sensor adjustm. → Variable adjust → Conduct. offset
Prerequisite	In the Conductivity measurement parameter (→  54), the On option is selected.
Description	Use this function to enter the zero point shift for the conductivity trim. The conductivity unit on which the shift is based is S/m
User entry	Signed floating-point number
Factory setting	0 S/m
Additional information	<i>Description</i>  Corrected value = (factor × value) + offset

Conductivity factor 

Navigation	 Expert → Sensor → Sensor adjustm. → Variable adjust → Conduct. factor
Prerequisite	In the Conductivity measurement parameter (→  54), the On option is selected.
Description	Use this function to enter a quantity factor for the conductivity. This multiplication factor is applied over the conductivity range.
User entry	Positive floating-point number
Factory setting	1
Additional information	<i>Description</i>  Corrected value = (factor × value) + offset

Corrected volume flow offset 

Navigation	 Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol offset
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	<i>Description</i>  Corrected value = (factor × value) + offset

Corrected volume flow factor



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

Temperature offset




Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Temp. offset
Prerequisite	For the following order code: "Sensor Option", option CI "Fluid temperature probe"
Description	Use this function to enter the zero point shift for the temperature trim. The temperature unit on which the shift is based is 1 K.
User entry	Signed floating-point number
Factory setting	0 K
Additional information	<i>Description</i> Corrected value = (factor × value) + offset

Temperature factor



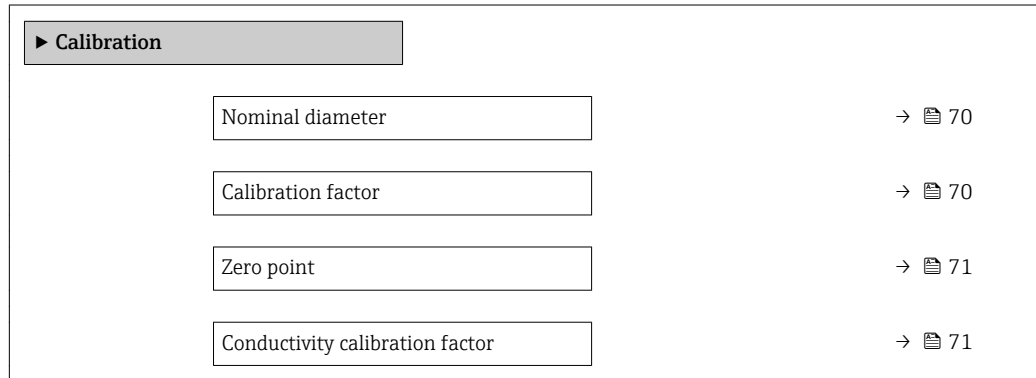
Navigation	Expert → Sensor → Sensor adjustm. → Variable adjust → Temp. factor
Prerequisite	For the following order code: "Sensor Option", option CI "Fluid temperature probe"
Description	Use this function to enter a quantity factor (without time) for the temperature. This multiplication factor is applied over the temperature range.
User entry	Positive floating-point number
Factory setting	1


Additional information*Description*

 Corrected value = (factor × value) + offset

3.2.6 "Calibration" submenu*Navigation*

 Expert → Sensor → Calibration

**Nominal diameter****Navigation**

 Expert → Sensor → Calibration → Nominal diameter

Description

Displays the nominal diameter of the sensor.

User interface

DN_{xx} / x"


Factory setting

Depends on the size of the sensor

Additional information*Description*

 The value is also specified on the sensor nameplate.

Calibration factor**Navigation**

 Expert → Sensor → Calibration → Cal. factor

Description

Displays the current calibration factor for the sensor.

User interface

Positive floating-point number

Factory setting

Depends on nominal diameter and calibration.

Zero point

Navigation Expert → Sensor → Calibration → Zero point

Description This function shows the zero point correction value for the sensor.

User interface Signed floating-point number

Factory setting Depends on nominal diameter and calibration

Conductivity calibration factor

Navigation Expert → Sensor → Calibration → Cond. cal. fact.

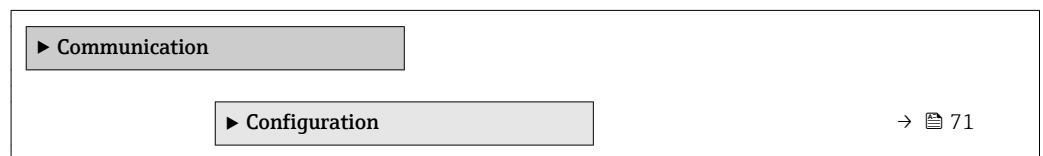
Prerequisite In the **Conductivity measurement** parameter (→ 54), the **On** option is selected.

Description Displays the calibration factor for the conductivity measurement.

User interface 0 to 10 000

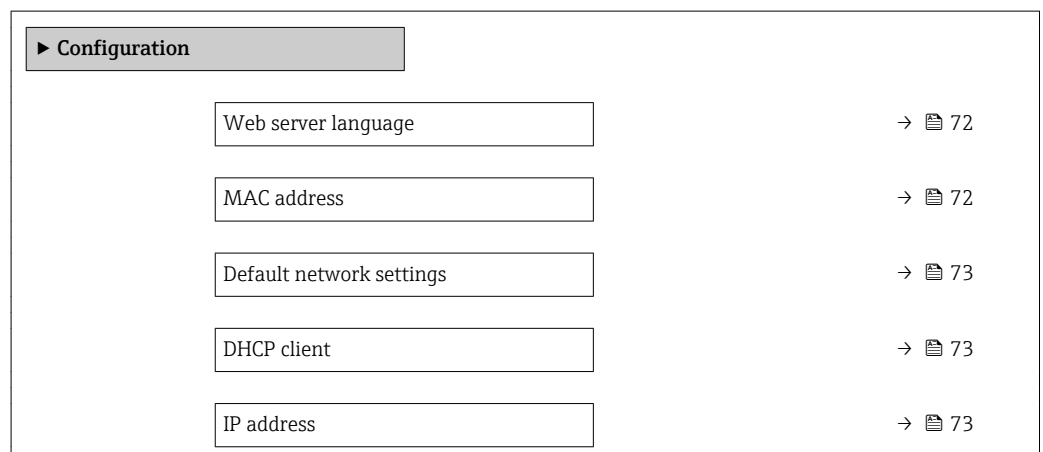
3.3 "Communication" submenu





Navigation Expert → Communication



3.3.1 "Configuration" submenu

Navigation Expert → Communication → Configuration



Subnet mask	→  74
Default gateway	→  74
Web server functionality	→  74
► Configurable input assembly	→  75

Web server language

Navigation   Expert → Communication → Configuration → Webserv.language

Description Use this function to select the web server language setting.

Selection

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

Factory setting English

MAC address

Navigation   Expert → Communication → Configuration → MAC Address

Description Displays the MAC ¹⁾ address of the measuring device.

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


Factory setting Each measuring device is given an individual address.

* Visibility depends on order options or device settings

1) Media Access Control

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

Default network settings

Navigation  Expert → Communication → Configuration → Default netw.set

Description Displays the use of default network settings.


User interface

- Off
- On

Factory setting Off

Additional information *User interface*
The **On** option is displayed as soon as the last octet of the IP address is set via DIP switches.

DHCP client




Navigation  Expert → Communication → Configuration → DHCP client


Description Use this function to activate and deactivate the DHCP client functionality.

Selection


- Off
- On

Factory setting On

Additional information *Result*
If the DHCP client functionality of the Web server is activated, the IP address (→  73), Subnet mask (→  74) and Default gateway (→  74) are set automatically.

 Identification is via the MAC address of the measuring device.

IP address

Navigation  Expert → Communication → Configuration → IP address

Description Use this function to enter the IP address of the device's web server.

User entry 4 octet: 0 to 255 (in the particular octet)

Factory setting 192.168.1.212

Subnet mask 

Navigation   Expert → Communication → Configuration → Subnet mask

Description Use this function to enter the subnet mask.

User entry 4 octet: 0 to 255 (in the particular octet)

Factory setting 255.255.255.0

Default gateway 

Navigation   Expert → Communication → Configuration → Default gateway

Description Use this function to enter the default gateway.

User entry 4 octet: 0 to 255 (in the particular octet)

Factory setting 0.0.0.0

Web server functionality 

Navigation   Expert → Communication → Configuration → Webserver funct.


Description Use this function to switch the Web server on and off.

Selection

- Off
- On

Factory setting On



Additional information *Description*





















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

Selection

- Off
 - The web server is completely disabled.
 - Port 80 is locked.
- On
 - The complete functionality of the web server is available.
 - JavaScript is used.
 - The password is transferred in an encrypted state.
 - Any change to the password is also transferred in an encrypted state.

"Configurable input assembly" submenu

Navigation   Expert → Communication → Configuration → Input assembly

► Configurable input assembly	
Input assembly position 1	→  76
Input assembly position 2	→  76
Input assembly position 3	→  76
Input assembly position 4	→  77
Input assembly position 5	→  77
Input assembly position 6	→  77
Input assembly position 7	→  77
Input assembly position 8	→  78
Input assembly position 9	→  78
Input assembly position 10	→  78
Input assembly position 11	→  78
Input assembly position 12	→  79
Input assembly position 13	→  79
Input assembly position 14	→  79
Input assembly position 15	→  80
Input assembly position 16	→  80
Input assembly position 17	→  80
Input assembly position 18	→  80
Input assembly position 19	→  81
Input assembly position 20	→  81

Input assembly position 1



Navigation	Expert → Communication → Configuration → Input assembly → Position 1
Description	Use this function to select a process variable for input value 1.
Selection	<ul style="list-style-type: none"> ■ Off ■ Mass flow ■ Volume flow ■ Corrected volume flow ■ Temperature * ■ Conductivity * ■ Totalizer 1 ■ Totalizer 2 ■ Totalizer 3 ■ Electronic temperature ■ Velocity
Factory setting	Volume flow

Input assembly position 2



Navigation	Expert → Communication → Configuration → Input assembly → Position 2
Description	Use this function to select a process variable for input value 2.
Selection	Picklist, see Input assembly position 1 parameter (→ 76)
Factory setting	Conductivity

Input assembly position 3



Navigation	Expert → Communication → Configuration → Input assembly → Position 3
Description	Use this function to select a process variable for input value 3.
Selection	Picklist, see Input assembly position 1 parameter (→ 76)
Factory setting	Temperature

* Visibility depends on order options or device settings

Input assembly position 4



Navigation	Expert → Communication → Configuration → Input assembly → Position 4
Description	Use this function to select a process variable for input value 4.
Selection	Picklist, see Input assembly position 1 parameter (→ 76)
Factory setting	Corrected volume flow

Input assembly position 5



Navigation	Expert → Communication → Configuration → Input assembly → Position 5
Description	Use this function to select a process variable for input value 5.
Selection	Picklist, see Input assembly position 1 parameter (→ 76)
Factory setting	Mass flow

Input assembly position 6



Navigation	Expert → Communication → Configuration → Input assembly → Position 6
Description	Use this function to select a process variable for input value 6.
Selection	Picklist, see Input assembly position 1 parameter (→ 76)
Factory setting	Totalizer 1

Input assembly position 7



Navigation	Expert → Communication → Configuration → Input assembly → Position 7
Description	Use this function to select a process variable for input value 7.
Selection	Picklist, see Input assembly position 1 parameter (→ 76)
Factory setting	Totalizer 2

Input assembly position 8



Navigation	Expert → Communication → Configuration → Input assembly → Position 8
Description	Use this function to select a process variable for input value 8.
Selection	Picklist, see Input assembly position 1 parameter (→ 76)
Factory setting	Totalizer 3

Input assembly position 9



Navigation	Expert → Communication → Configuration → Input assembly → Position 9
Description	Use this function to select a process variable for input value 9.
Selection	Picklist, see Input assembly position 1 parameter (→ 76)
Factory setting	Velocity

Input assembly position 10



Navigation	Expert → Communication → Configuration → Input assembly → Position 10
Description	Use this function to select a process variable for input value 10.
Selection	Picklist, see Input assembly position 1 parameter (→ 76)
Factory setting	Off

Input assembly position 11



Navigation	Expert → Communication → Configuration → Input assembly → Position 11
Description	Use this function to select a process variable for input value 11.
Selection	<ul style="list-style-type: none">■ Off■ Actual diagnostics■ Previous diagnostics■ Mass flow unit■ Volume flow unit■ Temperature unit *■ Conductivity unit *

* Visibility depends on order options or device settings


- Unit totalizer 1
- Unit totalizer 2
- Unit totalizer 3
- Velocity unit
- Verification results *
- Verification status *

Factory setting Volume flow unit

Input assembly position 12

Navigation   Expert → Communication → Configuration → Input assembly → Position 12

Description Use this function to select a process variable for input value 12.


Selection Picklist, see **Input assembly position 11** parameter (→  78)

Factory setting Conductivity unit

Input assembly position 13

Navigation   Expert → Communication → Configuration → Input assembly → Position 13

Description Use this function to select a process variable for input value 13.


Selection Picklist, see **Input assembly position 11** parameter (→  78)

Factory setting Temperature unit

Input assembly position 14

Navigation   Expert → Communication → Configuration → Input assembly → Position 14

Description Use this function to select a process variable for input value 14.

Selection Picklist, see **Input assembly position 11** parameter (→  78)

Factory setting Corrected volume flow unit

* Visibility depends on order options or device settings

Input assembly position 15



Navigation	Expert → Communication → Configuration → Input assembly → Position 15
Description	Use this function to select a process variable for input value 15.
Selection	Picklist, see Input assembly position 11 parameter (→ 78)
Factory setting	Mass flow unit

Input assembly position 16



Navigation	Expert → Communication → Configuration → Input assembly → Position 16
Description	Use this function to select a process variable for input value 16.
Selection	Picklist, see Input assembly position 11 parameter (→ 78)
Factory setting	Unit totalizer 1

Input assembly position 17



Navigation	Expert → Communication → Configuration → Input assembly → Position 17
Description	Use this function to select a process variable for input value 17.
Selection	Picklist, see Input assembly position 11 parameter (→ 78)
Factory setting	Unit totalizer 2

Input assembly position 18



Navigation	Expert → Communication → Configuration → Input assembly → Position 18
Description	Use this function to select a process variable for input value 18.
Selection	Picklist, see Input assembly position 11 parameter (→ 78)
Factory setting	Unit totalizer 3

Input assembly position 19

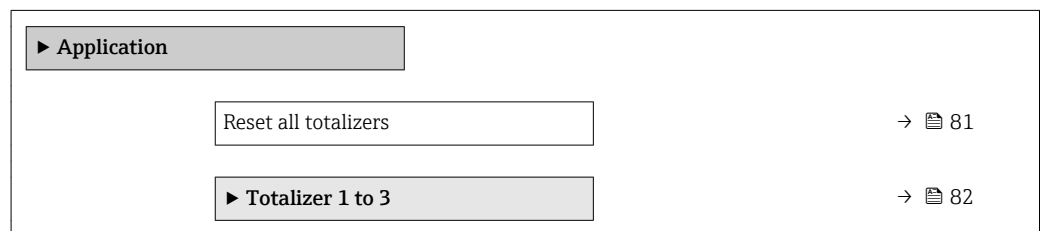
Navigation	Expert → Communication → Configuration → Input assembly → Position 19
Description	Use this function to select a process variable for input value 19.
Selection	Picklist, see Input assembly position 11 parameter (→ 78)
Factory setting	Velocity unit

Input assembly position 20

Navigation	Expert → Communication → Configuration → Input assembly → Position 20
Description	Use this function to select a process variable for input value 20.
Selection	Picklist, see Input assembly position 11 parameter (→ 78)
Factory setting	Off

3.4 "Application" submenu


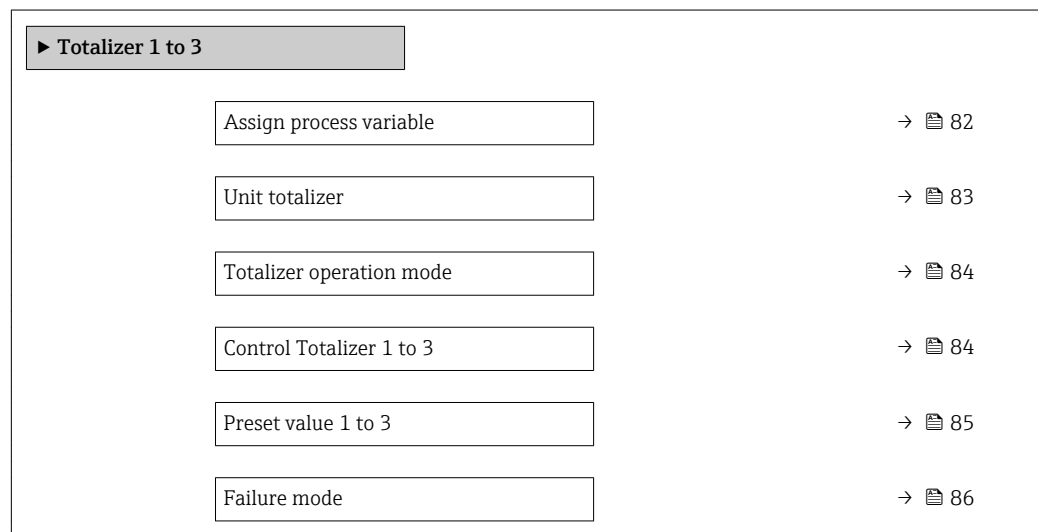
Navigation Expert → Application

**Reset all totalizers**

Navigation	Expert → Application → Reset all tot.
Description	Use this function to reset all totalizers to the value 0 and restart the totaling process. This deletes all the flow values previously totaled.
Selection	<ul style="list-style-type: none"> ■ Cancel ■ Reset + totalize
Factory setting	Cancel

Additional information*Selection*

- **Cancel**
No action is executed and the user exits the parameter.
- **Reset + totalize**
All totalizers are reset to 0 and the totaling process is restarted.

3.4.1 "Totalizer 1 to 3" submenu*Navigation*
 Expert → Application → Totalizer 1 to 3
**Assign process variable****Navigation**
 Expert → Application → Totalizer 1 to 3 → Assign variable
Description

Use this function to select a process variable for the Totalizer 1 to 3.


Selection

- Off
- Volume flow
- Mass flow
- Corrected volume flow


Factory setting

Volume flow

Additional information*Description*

 If the option selected is changed, the device resets the totalizer to 0.

Selection

If the **Off** option is selected, only **Assign process variable** parameter (→  82) is still displayed in the **Totalizer 1 to 3** submenu. All other parameters in the submenu are hidden.

**Unit totalizer****Navigation**

Expert → Application → Totalizer 1 to 3 → Unit totalizer

Prerequisite

One of the following options is selected in the **Assign process variable** parameter (→ 82) of the **Totalizer 1 to 3** submenu:

- Volume flow
- Mass flow
- Corrected volume flow

Description

Use this function to select the unit for the process variable of totalizer 1-3.

Selection*SI units*

- g
- kg
- t

US units

- oz
- lb
- STon

Custom-specific units

User mass

or

SI units

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

US units

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

Imperial units

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

Custom-specific units

User vol.

or

SI units

- Nl
- Nm³
- Sm³

US units

- Sft³
- Sgal (us)
- Sbbl (us;liq.)

Imperial units

Sgal (imp)




Custom-specific units

UserCrVol.



Factory setting

Country-specific:



- l
- gal (us)



Additional information	<p><i>Description</i></p> <p> The unit is selected separately for each totalizer. The unit is independent of the option selected in the System units submenu (→  39).</p> <p><i>Selection</i></p> <p>The selection depends on the process variable selected in the Assign process variable parameter (→  82).</p>
-------------------------------	--

Totalizer operation mode






Navigation	 Expert → Application → Totalizer 1 to 3 → Operation mode
Prerequisite	<p>One of the following options is selected in the Assign process variable parameter (→  82) of the Totalizer 1 to 3 submenu:</p> <ul style="list-style-type: none"> ■ Volume flow ■ Mass flow ■ Corrected volume flow
Description	Use this function to select how the totalizer summates the flow.
Selection	<ul style="list-style-type: none"> ■ Net flow total ■ Forward flow total ■ Reverse flow total
Factory setting	Net flow total
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Net flow total Positive and negative flow values are totalized and balanced against one another. Net flow is registered in the flow direction. ■ Forward flow total Only the flow in the forward flow direction is totalized. ■ Reverse flow total Only the flow against the forward flow direction is totalized (= reverse flow total).

Control Totalizer 1 to 3

Navigation	 Expert → Application → Totalizer 1 to 3 → Control Tot. 1 to 3
Prerequisite	<p>One of the following options is selected in the Assign process variable parameter (→  82) of the Totalizer 1 to 3 submenu:</p> <ul style="list-style-type: none"> ■ Volume flow ■ Mass flow ■ Corrected volume flow
Description	Use this function to select the control of totalizer value 1-3.



Selection	<ul style="list-style-type: none"> ■ Totalize ■ Reset + hold ■ Preset + hold ■ Reset + totalize ■ Preset + totalize
Factory setting	Totalize
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ 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 (→  85). ■ Reset + totalize The totalizer is reset to 0 and the totaling process is restarted. ■ Preset + totalize The totalizer is set to the defined start value in the Preset value parameter (→  85) and the totaling process is restarted.

Preset value 1 to 3


Navigation	  Expert → Application → Totalizer 1 to 3 → Preset value 1 to 3
Prerequisite	<p>One of the following options is selected in the Assign process variable parameter (→  82) of the Totalizer 1 to 3 submenu:</p> <ul style="list-style-type: none"> ■ Volume flow ■ Mass flow ■ Corrected volume flow
Description	Use this function to enter a start value for totalizer 1-3.
User entry	Signed floating-point number
Factory setting	0 1
Additional information	<p><i>User entry</i></p> <p> The unit of the selected process variable is specified for the totalizer in the Unit totalizer parameter (→  83).</p> <p><i>Example</i></p> <p>This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.</p>

Failure mode

Navigation

  Expert → Application → Totalizer 1 to 3 → Failure mode

Prerequisite

One of the following options is selected in the **Assign process variable** parameter (→  82) of the **Totalizer 1 to 3** submenu:

- Volume flow
- Mass flow
- Corrected volume flow

Description

Use this function to select how a totalizer behaves in the event of a device alarm.

Selection


- Stop
- Actual value
- Last valid value

Factory setting

Stop

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.

3.5 "Diagnostics" submenu




Navigation

  Expert → Diagnostics



▶ Diagnostics		
Actual diagnostics		→  87
Previous diagnostics		→  88
Operating time from restart		→  88
Operating time		→  89
▶ Diagnostic list		→  89

▶ Event logbook	→ 📄 93
▶ Device information	→ 📄 95
▶ Min/max values	→ 📄 98
▶ Heartbeat	→ 📄 100
▶ Simulation	→ 📄 101


Actual diagnostics

Navigation	 Expert → Diagnostics → Actual diagnos.
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	<p><i>Display</i></p> <p> Additional pending diagnostic messages can be viewed in the Diagnostic list submenu (→ 📄 89).</p> <p><i>Example</i></p> <p>For the display format:  F271 Main electronic failure</p>




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	<p><i>Display</i></p> <p> The diagnostic message can be viewed via the Actual diagnostics parameter (→ 📄 87).</p> <p><i>Example</i></p> <p>For the display format: 24d12h13m00s</p>


Previous diagnostics

Navigation	 Expert → Diagnostics → Prev.diagnostics
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	<p><i>Example</i></p> <p>For the display format:</p> <p>⊗F271 Main electronic failure</p>


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	<p><i>Display</i></p> <p> The diagnostic message can be viewed via the Previous diagnostics parameter (→  88).</p> <p><i>Example</i></p> <p>For the display format:</p> <p>24d12h13m00s</p>

Operating time from restart






Navigation	 Expert → Diagnostics → Time fr. restart
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
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	<p><i>User interface</i></p> <p>The maximum number of days is 9999, which is equivalent to 27 years.</p>

3.5.1 "Diagnostic list" submenu




Navigation  Expert → Diagnostics → Diagnostic list

▶ Diagnostic list	
Diagnostics 1	→  89
Diagnostics 2	→  90
Diagnostics 3	→  91
Diagnostics 4	→  91
Diagnostics 5	→  92





Diagnostics 1

Navigation	 Expert → Diagnostics → Diagnostic list → Diagnostics 1
Description	Displays the current diagnostics message with the highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	<p><i>Examples</i></p> <p>For the display format:</p> <ul style="list-style-type: none"> ■  F271 Main electronic failure ■  F276 I/O module failure




Timestamp

Navigation	 Expert → Diagnostics → Diagnostic list → Timestamp
Description	Displays the operating time when the diagnostic message with the highest priority occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<p><i>Display</i></p> <p> The diagnostic message can be viewed via the Diagnostics 1 parameter (→  89).</p> <p><i>Example</i></p> <p>For the display format: 24d12h13m00s</p>




Diagnostics 2

Navigation	  Expert → Diagnostics → Diagnostic list → Diagnostics 2
Description	Displays the current diagnostics message with the second-highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	<p><i>Examples</i></p> <p>For the display format:</p> <ul style="list-style-type: none"> ■  F271 Main electronic failure ■  F276 I/O module failure




Timestamp

Navigation	 Expert → Diagnostics → Diagnostic list → Timestamp
Description	Displays the operating time when the diagnostic message with the second-highest priority occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<p><i>Display</i></p> <p> The diagnostic message can be viewed via the Diagnostics 2 parameter (→  90).</p> <p><i>Example</i></p> <p>For the display format: 24d12h13m00s</p>




Diagnostics 3

Navigation	 Expert → Diagnostics → Diagnostic list → Diagnostics 3
Description	Displays the current diagnostics message with the third-highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	<p><i>Examples</i></p> <p>For the display format:</p> <ul style="list-style-type: none"> ■  F271 Main electronic failure ■  F276 I/O module failure




Timestamp

Navigation	 Expert → Diagnostics → Diagnostic list → Timestamp
Description	Displays the operating time when the diagnostic message with the third-highest priority occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<p><i>Display</i></p> <p> The diagnostic message can be viewed via the Diagnostics 3 parameter (→  91).</p> <p><i>Example</i></p> <p>For the display format: 24d12h13m00s</p>





Diagnostics 4

Navigation	 Expert → Diagnostics → Diagnostic list → Diagnostics 4
Description	Displays the current diagnostics message with the fourth-highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	<p><i>Examples</i></p> <p>For the display format:</p> <ul style="list-style-type: none"> ■  F271 Main electronic failure ■  F276 I/O module failure




Timestamp

Navigation	 Expert → Diagnostics → Diagnostic list → Timestamp
Description	Displays the operating time when the diagnostic message with the fourth-highest priority occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<p><i>Display</i></p> <p> The diagnostic message can be viewed via the Diagnostics 4 parameter (→  91).</p> <p><i>Example</i></p> <p>For the display format: 24d12h13m00s</p>

Diagnostics 5

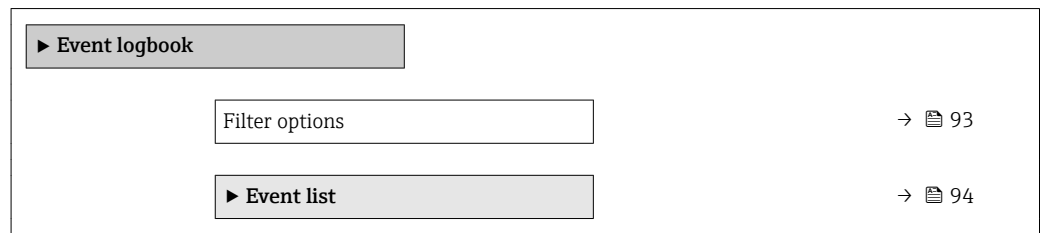
Navigation	  Expert → Diagnostics → Diagnostic list → Diagnostics 5
Description	Displays the current diagnostics message with the fifth-highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	<p><i>Examples</i></p> <p>For the display format:</p> <ul style="list-style-type: none"> ■  F271 Main electronic failure ■  F276 I/O module failure

Timestamp



Navigation	 Expert → Diagnostics → Diagnostic list → Timestamp
Description	Displays the operating time when the diagnostic message with the fifth-highest priority occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<p><i>Display</i></p> <p> The diagnostic message can be viewed via the Diagnostics 5 parameter (→  92).</p> <p><i>Example</i></p> <p>For the display format: 24d12h13m00s</p>

3.5.2 "Event logbook" submenu


Navigation  Expert → Diagnostics → Event logbook



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 local display.
Selection	<ul style="list-style-type: none"> ▪ All ▪ Failure (F) ▪ Function check (C) ▪ Out of specification (S) ▪ Maintenance required (M) ▪ Information (I)
Factory setting	All
Additional information	<p><i>Description</i></p> <p> The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:</p> <ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ All ▪ Failure (F) ▪ Function check (C) ▪ Out of specification (S) ▪ Maintenance required (M) ▪ Information (I)


Factory setting All

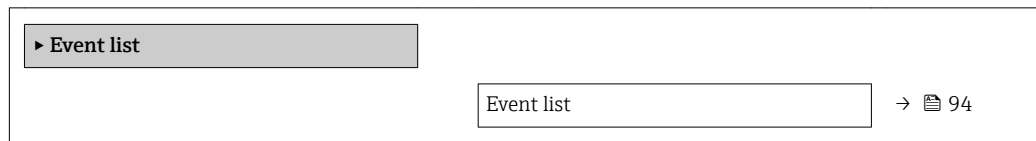
Additional information *Description*

-  The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:
- F = Failure
 - C = Function Check
 - S = Out of Specification
 - M = Maintenance Required


"Event list" submenu

-  The **Event list** submenu is only displayed if operating via the local display.
- If operating via the FieldCare operating tool, the event list can be read out with a separate FieldCare module.
- If operating via the Web browser, the event messages can be found directly in the **Event logbook** submenu.

Navigation  Expert → Diagnostics → Event logbook → Event list



Event list

Navigation  Expert → Diagnostics → Event logbook → Event list

Description Displays the history of event messages of the category selected in the **Filter options** parameter (→  93).

User interface

- For a "Category I" event message
Information event, short message, symbol for event recording and operating time when error occurred
- For a "Category F, C, S, M" event message (status signal)
Diagnostics code, short message, symbol for event recording and operating time when error occurred

Additional information *Description*

A maximum of 20 event messages are displayed in chronological order.

If the advanced HistoROM function is enabled in the device, the event list can contain up to 100 entries.

The following symbols indicate whether an event has occurred or has ended:

- ☹: Occurrence of the event
- ☺: End of the event

Examples

For the display format:

- I1091 Configuration modified
☹ 24d12h13m00s
- ☹F271 Main electronic failure
☹ 01d04h12min30s










HistoROM

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

3.5.3 "Device information" submenu



Navigation   Expert → Diagnostics → Device info

▶ **Device information**

Device tag	→  95
Serial number	→  96
Firmware version	→  96
Device name	→  96
Order code	→  97
Extended order code 1	→  97
Extended order code 2	→  97
Extended order code 3	→  98
ENP version	→  98

Device tag

Navigation

  Expert → Diagnostics → Device info → Device tag

Description


Displays a unique name for the measuring point so it can be identified quickly within the plant.

User interface


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

Factory setting Promag 100

Serial number


Navigation  Expert → Diagnostics → Device info → Serial number

Description Displays the serial number of the measuring device.

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


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

Additional information *Description*

 **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

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

Description Displays the name of the transmitter. It can also be found on the nameplate of the transmitter.

User interface Promag 100

Order code 	
Navigation	  Expert → Diagnostics → Device info → Order code
Description	Displays the device order code.
User interface	Character string composed of letters, numbers and certain punctuation marks (e.g. /).
Additional information	<p><i>Description</i></p> <p> The order code can be found on the nameplate of the sensor and transmitter in the "Order code" field.</p> <p>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.</p> <p> Uses of the order code</p> <ul style="list-style-type: none"> ▪ To order an identical spare device. ▪ To identify the device quickly and easily, e.g. when contacting Endress+Hauser.
Extended order code 1 	
Navigation	  Expert → Diagnostics → Device info → Ext. order cd. 1
Description	<p>Displays the first part of the extended order code.</p> <p>On account of length restrictions, the extended order code is split into a maximum of 3 parameters.</p>
User interface	Character string
Additional information	<p><i>Description</i></p> <p>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.</p> <p> The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.</p>
Extended order code 2 	
Navigation	  Expert → Diagnostics → Device info → Ext. order cd. 2
Description	For displaying the second part of the extended order code.
User interface	Character string
Additional information	For additional information, see Extended order code 1 parameter (→  97)

Extended order code 3

Navigation	Expert → Diagnostics → Device info → Ext. order cd. 3
Description	For displaying the third part of the extended order code.
User interface	Character string
Additional information	For additional information, see Extended order code 1 parameter (→ 97)

ENP version

Navigation	Expert → Diagnostics → Device info → ENP version
Description	Displays the version of the electronic nameplate.
User interface	Character string
Factory setting	2.02.00
Additional information	<p><i>Description</i></p> <p>This electronic nameplate stores a data record for device identification that includes more data than the nameplates attached to the outside of the device.</p>

3.5.4 "Min/max values" submenu

Navigation Expert → Diagnostics → Min/max val.


▶ Min/max values	
Reset min/max values	→ 98
▶ Main electronic temperature	→ 99
▶ Temperature	→ 100

Reset min/max values



Navigation	Expert → Diagnostics → Min/max val. → Reset min/max
Description	Use this function to select measured variables whose minimum, maximum and average measured values are to be reset.

Selection	Cancel
Factory setting	Cancel




"Main electronic temperature" submenu

Navigation  Expert → Diagnostics → Min/max val. → Main elect.temp.




▶ **Main electronic temperature**

Minimum value	→  99
Maximum value	→  99

Minimum value

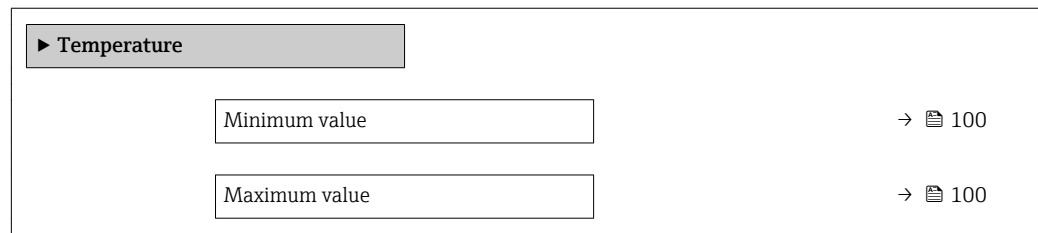
Navigation	 Expert → Diagnostics → Min/max val. → Main elect.temp. → Minimum value
Description	Displays the lowest previously measured temperature value of the main electronics module.
User interface	Signed floating-point number
Additional information	<p><i>Dependency</i></p> <p> The unit is taken from the Temperature unit parameter (→  42)</p>




Maximum value

Navigation	 Expert → Diagnostics → Min/max val. → Main elect.temp. → Maximum value
Description	Displays the highest previously measured temperature value of the main electronics module.
User interface	Signed floating-point number
Additional information	<p><i>Dependency</i></p> <p> The unit is taken from the Temperature unit parameter (→  42)</p>




"Temperature" submenu

Navigation  Expert → Diagnostics → Min/max val. → Temperature


**Minimum value**


Navigation	 Expert → Diagnostics → Min/max val. → Temperature → Minimum value
Prerequisite	For the following order code: "Sensor Option", option CI "Fluid temperature probe"
Description	Displays the lowest previously measured medium temperature value.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Temperature unit parameter (→  42)

Maximum value

Navigation	 Expert → Diagnostics → Min/max val. → Temperature → Maximum value
Prerequisite	For the following order code: "Sensor Option", option CI "Fluid temperature probe"
Description	Displays the highest previously measured medium temperature value.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Temperature unit parameter (→  42)

3.5.5 "Heartbeat" submenu


 For detailed information on the parameter descriptions of the **Heartbeat Verification** application package, see the Special Documentation for the device

Navigation   Expert → Diagnostics → Heartbeat






▶ Heartbeat

- ▶ Heartbeat base settings
- ▶ Performing verification
- ▶ Verification results
- ▶ Monitoring results



3.5.6 "Simulation" submenu

Navigation   Expert → Diagnostics → Simulation

▶ Simulation

- Assign simulation process variable →  101
- Value process variable →  102
- Simulation device alarm →  102
- Diagnostic event category →  103
- Simulation diagnostic event →  103

Assign simulation process variable












Navigation   Expert → Diagnostics → Simulation → Assign proc.var.

Description Use this function to select a process variable for the simulation process that is activated. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

- Selection**
- Off
 - Volume flow
 - Mass flow
 - Corrected volume flow
 - Conductivity *
 - Corrected conductivity *
 - Temperature *



Factory setting Off

* Visibility depends on order options or device settings





Additional information	<i>Description</i>  The simulation value of the process variable selected is defined in the Value process variable parameter (→  102).
<hr/>	
Value process variable 	
Navigation	  Expert → Diagnostics → Simulation → Value proc. var.
Prerequisite	One of the following options is selected in the Assign simulation process variable parameter (→  101): <ul style="list-style-type: none"> ■ Volume flow ■ Mass flow ■ Corrected volume flow ■ Conductivity* ■ Corrected conductivity* ■ Temperature*
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	<i>User entry</i>  The unit of the displayed measured value is taken from the System units submenu (→  39).
<hr/>	
Simulation device alarm 	
Navigation	  Expert → Diagnostics → Simulation → Sim. alarm
Description	Use this function to switch the device alarm on and off.
Selection	<ul style="list-style-type: none"> ■ Off ■ On
Factory setting	Off
Additional information	<i>Description</i> The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

* Visibility depends on order options or device settings

Diagnostic event category

Navigation	 Expert → Diagnostics → Simulation → Event category
Description	Use this function to select the category of the diagnostic events that are displayed for the simulation in the Simulation diagnostic event parameter (→  103).
Selection	<ul style="list-style-type: none">■ Sensor■ Electronics■ Configuration■ Process
Factory setting	Process

Simulation diagnostic event

Navigation	  Expert → Diagnostics → Simulation → Sim. diag. event
Description	Use this function to select a diagnostic event for the simulation process that is activated.
Selection	<ul style="list-style-type: none">■ Off■ Diagnostic event picklist (depends on the category selected)
Factory setting	Off
Additional information	<p><i>Description</i></p> <p> For the simulation, you can choose from the diagnostic events of the category selected in the Diagnostic event category parameter (→  103).</p>

4 Country-specific factory settings


4.1 SI units

 Not valid for USA and Canada.

4.1.1 System units

Volume flow	l/h
Volume	m ³
Conductivity	μS/cm
Temperature	°C
Mass flow	kg/h
Mass	kg
Density	kg/l
Corrected volume flow	NI/h
Corrected volume	Nm ³


4.1.2 Full scale values

 The factory settings apply to the following parameters:
100% bar graph value 1

Nominal diameter [mm]	(v ~ 2.5 m/s) [dm ³ /min]
2	0.5
4	2
8	8
15	25
25	75
32	125
40	200
50	300
65	500
80	750
100	1200
125	1850
150	150 m ³ /h
200	300 m ³ /h
250	500 m ³ /h
300	750 m ³ /h
350	1000 m ³ /h
400	1200 m ³ /h
450	1500 m ³ /h

Nominal diameter [mm]	(v ~ 2.5 m/s) [dm ³ /min]
500	2000 m ³ /h
600	2500 m ³ /h

4.1.3 On value low flow cut off

 The switch-on point depends on the type of medium and the nominal diameter.

Nominal diameter [mm]	(v ~ 0.04 m/s) [m ³ /h]
2	0.01
4	0.05
8	0.1
15	0.5
25	1
32	2
40	3
50	5
65	8
80	12
100	20
125	30
150	2.5
200	5
250	7.5
300	10
350	15
400	20
450	25
500	30
600	40

4.2 US units


 Only valid for USA and Canada.

4.2.1 System units

Volume flow	gal/min (us)
Volume	gal (us)
Temperature	°F
Mass flow	lb/min
Mass	lb
Density	lb/ft ³


Corrected volume flow	Sft ³ /h
Corrected volume	Sft ³

4.2.2 Full scale values

 The factory settings apply to the following parameters:
100% bar graph value 1

Nominal diameter [in]	(v ~ 2.5 m/s) [gal/min]
1/12	0.1
1/8	0.5
3/8	2
1/2	6
1	18
1 1/2	50
2	75
3	200
4	300
5	450
6	600
8	1200
10	1500
12	2400
14	3600
16	4800
18	6000
20	7500
24	10500

4.2.3 On value low flow cut off

 The switch-on point depends on the type of medium and the nominal diameter.

Nominal diameter [in]	(v ~ 0.04 m/s) [gal/min]
1/12	0.002
1/8	0.008
3/8	0.025
1/2	0.15
1	0.25
1 1/2	0.75
2	1.25
3	2.5
4	4
5	7

Nominal diameter [in]	(v ~ 0.04 m/s) [gal/min]
6	12
8	15
10	30
12	45
14	60
16	60
18	90
20	120
24	180

5 Explanation of abbreviated units

5.1 SI units

Process variable	Units	Explanation
Density	g/cm ³ , g/m ³	Gram/volume unit
	kg/dm ³ , kg/l, kg/m ³	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).
Conductivity	µS/mm	Microsiemens/length unit
	nS/cm, µS/cm, mS/cm, S/cm	Nano- Micro- , Milli- , Siemens/length unit
	µS/m, mS/m, S/m, kS/m, MS/m	Micro- , Milli- , Siemens, Kilo-, Megasiemens/length unit
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
Corrected volume	Nl, Nm ³ , Sm ³	Normal liter, normal cubic meter, standard cubic meter
Corrected volume flow	Nl/s, Nl/min, Nl/h, Nl/d	Normal liter/time unit
	Nm ³ /s, Nm ³ /min, Nm ³ /h, Nm ³ /d	Normal cubic meter/time unit
	Sm ³ /s, Sm ³ /min, Sm ³ /h, Sm ³ /d	Standard cubic meter/time unit
Temperature	°C , K	Celsius, Kelvin
Volume	cm ³ , dm ³ , m ³	Cubic centimeter, cubic decimeter, cubic meter
	ml, l, hl, Ml Mega	Milliliter, liter, hectoliter, megaliter
Volume flow	cm ³ /s, cm ³ /min, cm ³ /h, cm ³ /d	Cubic centimeter/time unit
	dm ³ /s, dm ³ /min, dm ³ /h, dm ³ /d	Cubic decimeter/time unit
	m ³ /s, m ³ /min, m ³ /h, m ³ /d	Cubic meter/time unit
	ml/s, ml/min, ml/h, ml/d	Milliliter/time unit
	l/s, l/min, l/h, l/d	Liter/time unit
	hl/s, hl/min, hl/h, hl/d	Hectoliter/time unit
	Ml/s, Ml/min, Ml/h, Ml/d	Megaliter/time unit
Time	s, m, h, d, y	Second, minute, hour, day, year

5.2 US units

Process variable	Units	Explanation
Density	lb/ft ³ , 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
Mass	oz, lb, STon	Ounce, pound, standard ton
Mass flow	oz/s, oz/min, oz/h, oz/d	Ounce/time unit

Process variable	Units	Explanation
	lb/s, lb/min, lb/h, lb/d	Pound/time unit
	STon/s, STon/min, STon/h, STon/d	Standard ton/time unit
Corrected volume	Sft ³ , Sgal (us), Sbbl (us;liq.)	Standard cubic foot, standard gallon, standard barrel
Corrected volume flow	Sft ³ /s, Sft ³ /min, Sft ³ /h, Sft ³ /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
	ft ³	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
	ft ³ /s, ft ³ /min, ft ³ /h, ft ³ /d	Cubic foot/time unit
	fl oz/s (us), fl oz/min (us), fl oz/h (us), fl oz/d (us)	Fluid ounce/time unit
	gal/s (us), gal/min (us), gal/h (us), gal/d (us)	Gallon/time unit
	kgal/s (us), kgal/min (us), kgal/h (us), kgal/d (us)	Kilogallon/time unit
	Mgal/s (us), Mgal/min (us), Mgal/h (us), Mgal/d (us)	Million gallon/time unit
	bbl/s (us;liq.), bbl/min (us;liq.), bbl/h (us;liq.), bbl/d (us;liq.)	Barrel/time unit (normal liquids) Normal liquids: 31.5 gal/bbl
	bbl/s (us;beer), bbl/min (us;beer), bbl/h (us;beer), bbl/d (us;beer)	Barrel /time unit (beer) Beer: 31.0 gal/bbl
	bbl/s (us;oil), bbl/min (us;oil), bbl/h (us;oil), bbl/d (us;oil)	Barrel/time unit (petrochemicals) Petrochemicals: 42.0 gal/bbl
bbl/s (us;tank), bbl/min (us;tank), bbl/h (us;tank), bbl/d (us;tank)	Barrel/time unit (filling tank) Filling tanks: 55.0 gal/bbl	
Time	s, m, h, d, y	Second, minute, hour, day, year
	am, pm	Ante meridiem (before midday), post meridiem (after midday)

5.3 Imperial units

Process variable	Units	Explanation
Density	lb/gal (imp), lb/bbl (imp;beer), lb/bbl (imp;oil)	Pound/volume unit
Corrected volume	Sgal (imp)	Standard gallon
Corrected volume flow	Sgal/s (imp), Sgal/min (imp), Sgal/h (imp), Sgal/d (imp)	Standard gallon/time unit
Volume	gal (imp), Mgal (imp)	Gallon, mega gallon
	bbl (imp;beer), bbl (imp;oil)	Barrel (beer), barrel (petrochemicals)

Process variable	Units	Explanation
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
	bbbl/s (imp;beer), bbl/min (imp;beer), bbl/h (imp;beer), bbl/d (imp;beer)	Barrel /time unit (beer) Beer: 36.0 gal/bbl
	bbbl/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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