

Description of Device Parameters

Proline Promass 300

PROFINET

Coriolis flowmeter

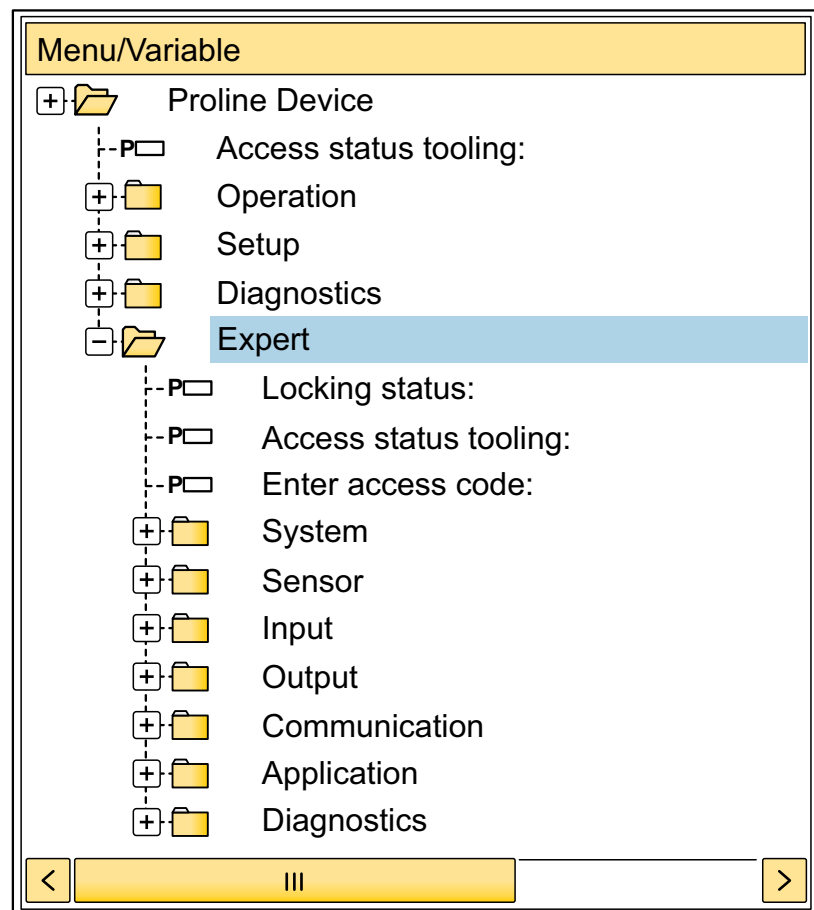


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1 About this document

1.1 Document function

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

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

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

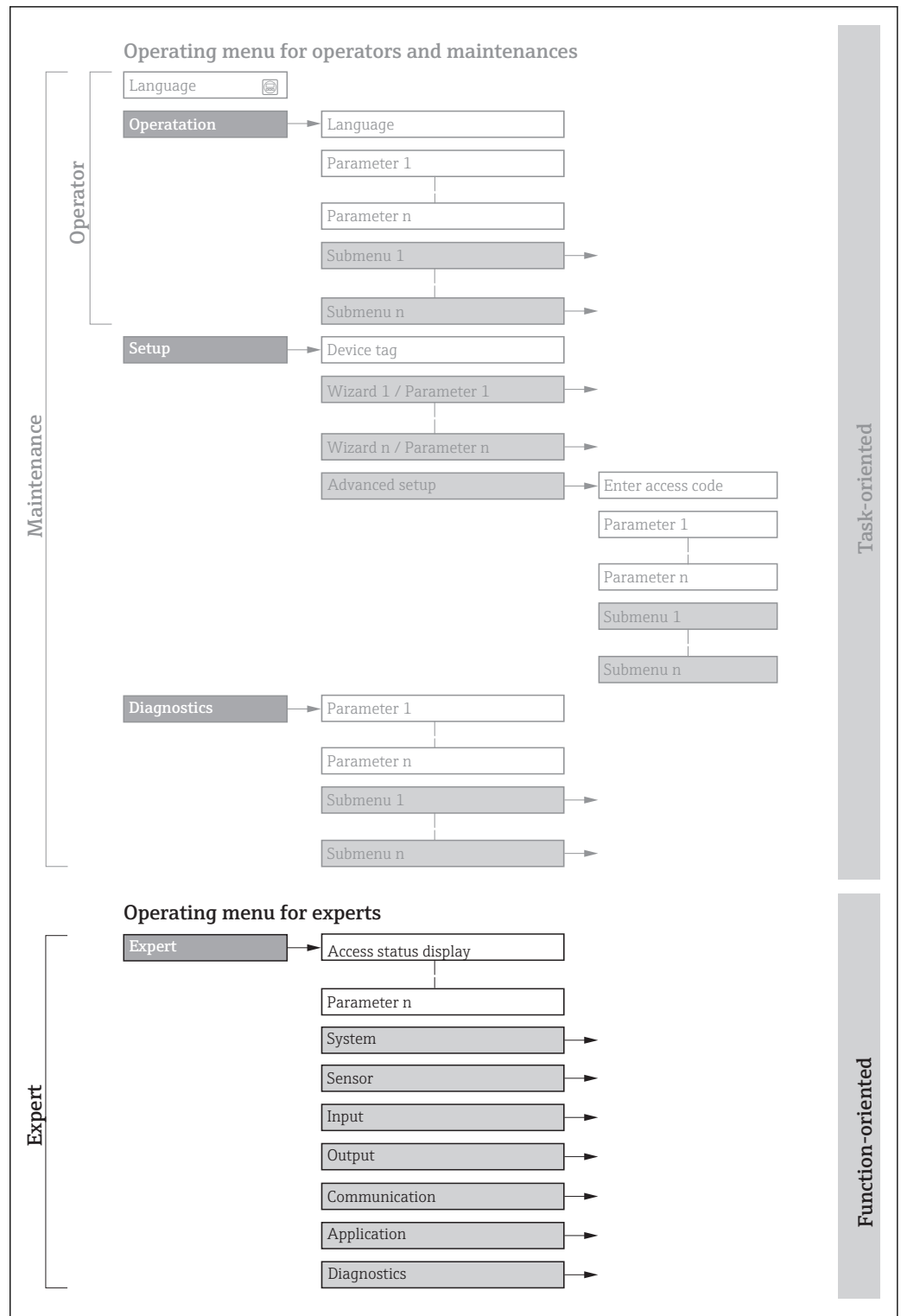
1.2 Target group

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

1.3 Using this document

1.3.1 Information on the document structure

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



1 Sample graphic for the schematic layout of the operating menu



Detailed information concerning:

- Arrangement of the parameters according to the menu structure of the **Operation** menu, **Setup** menu, **Diagnostics** menu along with a brief description, see the Operating Instructions for the device → 7
- Operating philosophy of the operating menu: "Operating philosophy" chapter of the Operating Instructions for the device → 7

1.3.2 Structure of a parameter description

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

Complete parameter name		Write-protected parameter = 
Navigation	 Navigation path to the parameter via the local display (direct access code) or web browser  Navigation path to the parameter via the operating tool The names of the menus, submenus and parameters are abbreviated to the form in which they appear on the display and in the operating tool.	
Prerequisite	The parameter is only available under these specific conditions	
Description	Description of the parameter function	
Selection	List of the individual options for the parameter ■ Option 1 ■ Option 2	
User entry	Input range for the parameter	
User interface	Display value/data for the parameter	
Factory setting	Default setting ex works	
Additional information	Additional explanations (e.g. in examples): ■ On individual options ■ On display values/data ■ On the input range ■ On the factory setting ■ On the parameter function	

1.4 Symbols used

1.4.1 Symbols for certain types of information

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

1.4.2 Symbols in graphics

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

1.5 Documentation

1.5.1 Standard documentation

Operating Instructions

Measuring device	Documentation code
Promass A 300	BA01736D
Promass E 300	BA01738D
Promass F 300	BA01739D
Promass H 300	BA01740D
Promass I 300	BA01741D
Promass O 300	BA01742D
Promass P 300	BA01743D
Promass Q 300	BA01744D
Promass S 300	BA01745D
Promass X 300	BA01746D

1.5.2 Supplementary device-dependent documentation

Special documentation

Contents	Documentation code
Information on the Pressure Equipment Directive	SD01614D
Remote display and operating module DKX001	SD01763D
Radio approvals for WLAN interface for A309/A310 display module	SD01793D
Web server	SD01969D
Heartbeat Technology	SD01988D
Concentration measurement	SD02005
Petroleum	SD02099D
Viscosity measurement Promass I	SD01993
Viscosity measurement Promass Q	SD01999

2 Overview of the Expert operating menu

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

 Expert		
Direct access (0106)	→ 	11
Locking status (0004)	→ 	12
Access status (0005)	→ 	13
Ent. access code (0003)	→ 	13
▶ System	→ 	13
▶ Display	→ 	14
▶ Config. backup	→ 	31
▶ Diagn. handling	→ 	34
▶ Administration	→ 	43
▶ Sensor	→ 	48
▶ Measured val.	→ 	49
▶ System units	→ 	63
▶ Process param.	→ 	79
▶ Measurement mode	→ 	87
▶ External comp.	→ 	89
▶ Calculated value	→ 	94
▶ Sensor adjustm.	→ 	98
▶ Calibration	→ 	106
▶ I/O config.	→ 	107
I/O 1 to n terminals (3902–1 to n)	→ 	108
I/O 1 to n info (3906–1 to n)	→ 	108

I/O 1 to n type (3901-1 to n)	→ 108
Apply I/O config (3907)	→ 109
Alteration code (2762)	→ 109
► Input	→ 110
► Current input 1 to n	→ 110
► Status input 1 to n	→ 113
► Output	→ 115
► Curr.output 1 to n	→ 115
► PFS output 1 to n	→ 131
► Relay output 1 to n	→ 157
► Communication	→ 164
► PROFINET config.	→ 165
► PROFINET info	→ 166
► Web server	→ 168
► WLAN settings	→ 172
► Application	→ 186
Reset all tot. (2806)	→ 186
► Totalizer 1 to n	→ 187
► Viscosity	→ 192
► Concentration	→ 192
► Petroleum	→ 192
► Diagnostics	→ 193
Actual diagnos. (0691)	→ 193
Prev.diagnostics (0690)	→ 194
Time fr. restart (0653)	→ 195

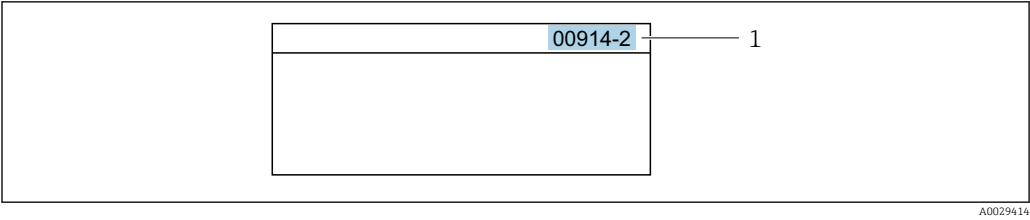
Operating time (0652)	→  195
▶ Diagnostic list	→  196
▶ Event logbook	→  200
▶ Device info	→  202
▶ Main elec.+I/O1	→  206
▶ Sens. electronic	→  207
▶ I/O module 2	→  209
▶ I/O module 3	→  210
▶ Display module	→  211
▶ Min/max val.	→  212
▶ Data logging	→  223
▶ Heartbeat	→  232
▶ Simulation	→  232

3 Description of Device Parameters

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

Expert		
Direct access (0106)	→	11
Locking status (0004)	→	12
Access status (0005)	→	13
Ent. access code (0003)	→	13
► System	→	13
► Sensor	→	48
► I/O config.	→	107
► Input	→	110
► Output	→	115
► Communication	→	164
► Application	→	186
► Diagnostics	→	193

Direct access		
Navigation	Expert → Direct access (0106)	
Description	Use this function to enter the access code to enable direct access to the desired parameter via the local display. A parameter number is assigned to each parameter for this purpose.	
User entry	0 to 65 535	
Additional information	<i>User entry</i> The direct access code consists of a 5-digit number (at maximum) and the channel number, which identifies the channel of a process variable: e.g. 00914-2. In the navigation view, this appears on the right-hand side in the header of the selected parameter.	



1 Direct access code

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

Locking status

Navigation Expert → Locking status (0004)

Description Displays the active write protection.

- User interface
- Hardware locked
 - Temp. locked

Additional information *User interface*

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

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

Selection

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

Access status	
Navigation	 Expert → Access status (0005)
Description	Displays the access authorization to the parameters via the local display, Web browser or operating tool.
User interface	▪ Operator ▪ Maintenance
Factory setting	Maintenance
Additional information	<i>Description</i>  Access authorization can be modified via the Ent. access code parameter (→  13).  If additional write protection is active, this restricts the current access authorization even further. <i>Display</i>  Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device →  7

Ent. access code	
Navigation	 Expert → Ent. access code (0003)
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	→  14
► Config. backup	→  31
► Diagn. handling	→  34
► Administration	→  43

3.1.1 "Display" submenu

Navigation  Expert → System → Display

► Display		
Display language (0104)	→ 	15
Format display (0098)	→ 	15
Value 1 display (0107)	→ 	18
0% bargraph 1 (0123)	→ 	19
100% bargraph 1 (0125)	→ 	20
Decimal places 1 (0095)	→ 	20
Value 2 display (0108)	→ 	21
Decimal places 2 (0117)	→ 	22
Value 3 display (0110)	→ 	23
0% bargraph 3 (0124)	→ 	24
100% bargraph 3 (0126)	→ 	25
Decimal places 3 (0118)	→ 	25
Value 4 display (0109)	→ 	25
Decimal places 4 (0119)	→ 	27
Display interval (0096)	→ 	27
Display damping (0094)	→ 	28
Header (0097)	→ 	28
Header text (0112)	→ 	29
Separator (0101)	→ 	30
Contrast display (0105)	→ 	30
Backlight (0111)	→ 	30

Display language

Navigation	 Expert → System → Display → Display language (0104)
Prerequisite	A local display is provided.
Description	Use this function to select the configured language on the local display.
Selection	■ English ■ Deutsch * ■ Français * ■ Español * ■ Italiano * ■ Nederlands * ■ Portuguesa * ■ Polski * ■ русский язык(Ru) * ■ Svenska * ■ Türkçe * ■ 中文 (Chinese) * ■ 日本語 (Japanese) * ■ 한국어 (Korean) * ■ Bahasa Indonesia * ■ tiếng Việt (Vit) * ■ čeština (Czech) *
Factory setting	English (alternatively, the ordered language is preset in the device)

Format display

Navigation	 Expert → System → Display → Format display (0098)
Prerequisite	A local display is provided.
Description	Use this function to select how the measured value is shown on the local display.
Selection	■ 1 value, max. ■ Bargr. + 1 value ■ 2 values ■ Val. large+2val. ■ 4 values
Factory setting	1 value, max.

* Visibility depends on order options or device settings

Additional information*Description*

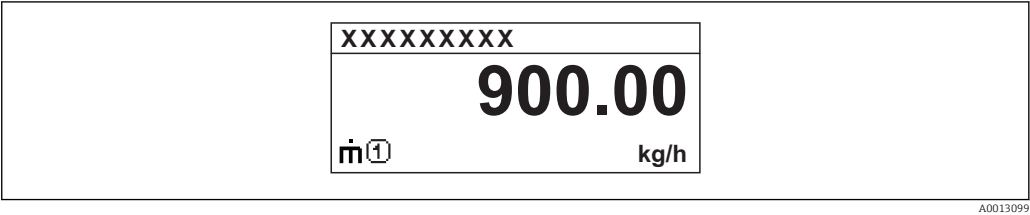
The display format (size, bar graph etc.) and number of measured values displayed simultaneously (1 to 4) can be configured. This setting only applies to normal operation.



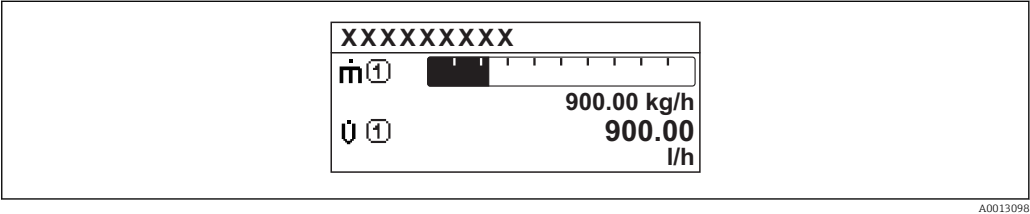
- The **Value 1 display** parameter (→ 18) to **Value 4 display** parameter (→ 25) are used to specify which measured values are shown on the local display and in what order.
- If more measured values are specified than the display mode selected permits, then the values alternate on the device display. The display time until the next change is configured via the **Display interval** parameter (→ 27).

Possible measured values shown on the local display:

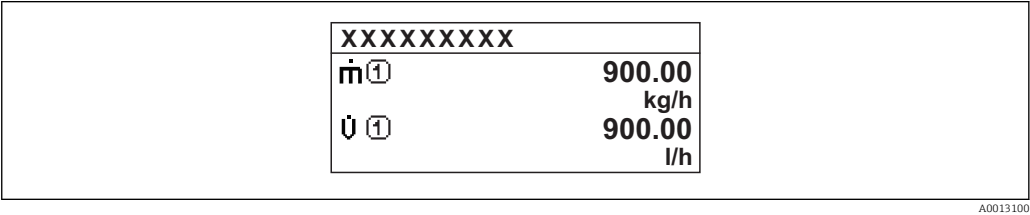
"1 value, max." option



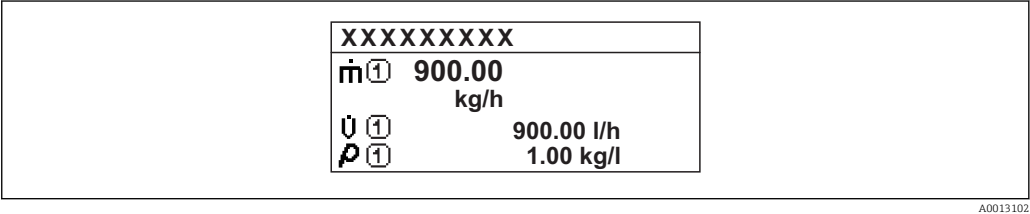
"Bagr. + 1 value" option



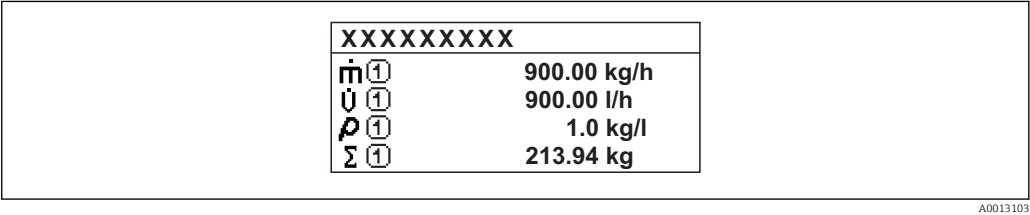
"2 values" option



"Val. large+2val." option



"4 values" option



Value 1 display	
Navigation	Expert → System → Display → Value 1 display (0107)
Prerequisite	A local display is provided.
Description	Use this function to select one of the measured values to be shown on the local display.
Selection	■ Mass flow ■ Volume flow ■ Correct.vol.flow ■ Target mass flow * ■ Carrier mass fl. * ■ Target vol. flow ■ Carrier vol. fl. ■ Targ.corr.vol.fl ■ Carr.corr.vol.fl ■ Density ■ Ref.density ■ Ref.dens.altern. ■ GSV flow ■ GSVa ■ NSV flow ■ NSVa ■ S&W volume flow ■ Water cut ■ Oil density ■ Water density ■ Oil mass flow ■ Water mass flow ■ Oil volume flow ■ Water vol. flow ■ Oil corr.vol.fl. ■ Water corr.v.fl. ■ Density average ■ Temp. average ■ Concentration * ■ Dynam. viscosity * ■ Kinematic visc. * ■ TempCompDynVisc * ■ TempCompKinVisc * ■ Temperature ■ Carr. pipe temp. * ■ Electronic temp. ■ Osc. freq. 0 ■ Osc. freq. 1 * ■ Osc. ampl. 0 * ■ Osc. ampl. 1 * ■ Freq. fluct. 0 ■ Freq. fluct. 1 * ■ Osc. damping 0 ■ Osc. damping 1 * ■ Osc.damp.fluct 0 ■ Osc.damp.fluct 1 * ■ Signal asymmetry

* Visibility depends on order options or device settings

- Exc. current 0
- Exc. current 1 *
- HBSI *
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Curr.output 1
- Curr.output 2 *
- Curr.output 3 *
- Pressure

Factory setting

Mass flow

Additional information*Description*

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

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

Dependency

 The unit of the displayed measured value is taken from the **System units** submenu (→  63).

Selection

- **Oscil. frequency** option
Displays the current oscillation frequency of the measuring tubes. This frequency depends on the density of the medium.
- **Oscil. amplitude** option
Displays the relative oscillation amplitude of the measuring tubes in relation to the preset value. This value is 100 % under optimum conditions.
- **Oscil. damping** option
Displays the current oscillation damping. Oscillation damping is an indicator of the sensor's current need for excitation power.
- **Signal asymmetry** option
Displays the relative difference between the oscillation amplitude at the inlet and outlet of the sensor. The measured value is the result of production tolerances of the sensor coils and should remain constant over the life time of a sensor.

0% bargraph 1**Navigation**

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

Prerequisite

A local display is provided.

Description

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

User entry

Signed floating-point number

* Visibility depends on order options or device settings

Factory setting	Country-specific: ■ 0 kg/h ■ 0 lb/min
Additional information	<i>Description</i>  The Format display parameter (→  15) is used to specify that the measured value is to be displayed as a bar graph. <i>User entry</i>  The unit of the displayed measured value is taken from the System units submenu (→  63).

100% bargraph 1

Navigation	  Expert → System → Display → 100% bargraph 1 (0125)
Prerequisite	A local display is provided.
Description	Use this function to enter the 100% bar graph value to be shown on the display for the measured value 1.
User entry	Signed floating-point number
Factory setting	Depends on country and nominal diameter →  242
Additional information	<i>Description</i>  The Format display parameter (→  15) is used to specify that the measured value is to be displayed as a bar graph. <i>User entry</i>  The unit of the displayed measured value is taken from the System units submenu (→  63).

Decimal places 1

Navigation	  Expert → System → Display → Decimal places 1 (0095)
Prerequisite	A measured value is specified in the Value 1 display parameter (→  18).
Description	Use this function to select the number of decimal places for measured value 1.
Selection	■ x ■ x.x ■ x.xx ■ x.xxx ■ x.xxxx
Factory setting	x.xx

Additional information*Description*

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

Value 2 display**Navigation**

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

Prerequisite

A local display is provided.

Description

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

Selection

- None
- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow
- Carrier mass fl.
- Target vol. flow
- Carrier vol. fl.
- Targ.corr.vol.fl
- Carr.corr.vol.fl
- Density
- Ref.density
- Ref.dens.altern.
- GSV flow
- GSVa
- NSV flow
- NSVa
- S&W volume flow
- Water cut
- Oil density
- Water density
- Oil mass flow
- Water mass flow
- Oil volume flow
- Water corr.v.fl.
- Oil corr.vol.fl.
- Water vol. flow
- Density average
- Temp. average
- Concentration
- Dynam. viscosity
- Kinematic visc.
- TempCompDynVisc
- TempCompKinVisc
- Temperature
- Carr. pipe temp.
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1
- Osc. ampl. 0
- Osc. ampl. 1
- Freq. fluct. 0

- Freq. fluct. 1
- Osc. damping 0
- Osc. damping 1
- Osc.damp.fluct 0
- Osc.damp.fluct 1
- Signal asymmetry
- Exc. current 0
- Exc. current 1
- HBSI
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Curr.output 1
- Curr.output 2 *
- Curr.output 3 *
- Curr.output 4 *
- Pressure

Factory setting

None

Additional information*Description*

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



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

Dependency

The unit of the displayed measured value is taken from the **System units** submenu (→ 63).

Decimal places 2**Navigation**

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

Prerequisite

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

Description

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

Selection

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

Factory setting

x.xx

Additional information*Description*

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

* Visibility depends on order options or device settings

Value 3 display

**Navigation**

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

Prerequisite

A local display is provided.

Description

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

Selection

- None
- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow
- Carrier mass fl.
- Target vol. flow
- Carrier vol. fl.
- Targ.corr.vol.fl
- Carr.corr.vol.fl
- Density
- Ref.density
- Ref.dens.altern.
- GSV flow
- GSVa
- NSV flow
- NSVa
- S&W volume flow
- Water cut
- Oil density
- Water density
- Oil mass flow
- Water mass flow
- Oil volume flow
- Water corr.v.fl.
- Oil corr.vol.fl.
- Water vol. flow
- Density average
- Temp. average
- Concentration
- Dynam. viscosity
- Kinematic visc.
- TempCompDynVisc
- TempCompKinVisc
- Temperature
- Carr. pipe temp.
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1
- Osc. ampl. 0
- Osc. ampl. 1
- Freq. fluct. 0
- Freq. fluct. 1
- Osc. damping 0
- Osc. damping 1
- Osc.damp.fluct 0
- Osc.damp.fluct 1
- Signal asymmetry
- Exc. current 0

- Exc. current 1
- HBSI
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Curr.output 1
- Curr.output 2 *
- Curr.output 3 *
- Curr.output 4 *
- Pressure

Factory setting

None

Additional information*Description*

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

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

Selection

 The unit of the displayed measured value is taken from the **System units** submenu (→  63).

0% bargraph 3**Navigation**

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

Prerequisite

A selection was made in the **Value 3 display** parameter (→  23).

Description

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

User entry

Signed floating-point number

Factory setting

Country-specific:

- 0 kg/h
- 0 lb/min

Additional information*Description*

 The **Format display** parameter (→  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 (→  63).

* Visibility depends on order options or device settings

100% bargraph 3 	
Navigation	  Expert → System → Display → 100% bargraph 3 (0126)
Prerequisite	A selection was made in the Value 3 display parameter (→  23).
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	<i>Description</i>
	 The Format display parameter (→  15) is used to specify that the measured value is to be displayed as a bar graph.
	<i>User entry</i>
	 The unit of the displayed measured value is taken from the System units submenu (→  63).
Decimal places 3 	
Navigation	  Expert → System → Display → Decimal places 3 (0118)
Prerequisite	A measured value is specified in the Value 3 display parameter (→  23).
Description	Use this function to select the number of decimal places for measured value 3.
Selection	■ x ■ x.x ■ x.xx ■ x.xxx ■ x.xxxx
Factory setting	x.xx
Additional information	<i>Description</i>
	 This setting does not affect the measuring or computational accuracy of the device. The arrow displayed between the measured value and the unit indicates that the device computes with more digits than are shown on the local display.
Value 4 display 	
Navigation	  Expert → System → Display → Value 4 display (0109)
Prerequisite	A local display is provided.

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

Selection

- None
- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow
- Carrier mass fl.
- Target vol. flow
- Carrier vol. fl.
- Targ.corr.vol.fl
- Carr.corr.vol.fl
- Density
- Ref.density
- Ref.dens.altern.
- GSV flow
- GSVa
- NSV flow
- NSVa
- S&W volume flow
- Water cut
- Oil density
- Water density
- Oil mass flow
- Water mass flow
- Oil volume flow
- Water corr.v.fl.
- Oil corr.vol.fl.
- Water vol. flow
- Density average
- Temp. average
- Concentration
- Dynam. viscosity
- Kinematic visc.
- TempCompDynVisc
- TempCompKinVisc
- Temperature
- Carr. pipe temp.
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1
- Osc. ampl. 0
- Osc. ampl. 1
- Freq. fluct. 0
- Freq. fluct. 1
- Osc. damping 0
- Osc. damping 1
- Osc.damp.fluct 0
- Osc.damp.fluct 1
- Signal asymmetry
- Exc. current 0
- Exc. current 1
- HBSI
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Curr.output 1

- Curr.output 2 *
- Curr.output 3 *
- Curr.output 4 *
- Pressure

Factory setting None

Additional information *Description*

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

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

Selection

 The unit of the displayed measured value is taken from the **System units** submenu (→  63).

Decimal places 4

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

Prerequisite A measured value is specified in the **Value 4 display** parameter (→  25).

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

Selection

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

Factory setting x.xx

Additional information *Description*

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

Display interval

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

Prerequisite A local display is provided.

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

* Visibility depends on order options or device settings

User entry 1 to 10 s

Factory setting 5 s

Additional information *Description*

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



- The **Value 1 display** parameter (→  18) to **Value 4 display** parameter (→  25) are used to specify which measured values are shown on the local display.
- The display format of the displayed measured values is specified using the **Format display** parameter (→  15).

Display damping

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

Prerequisite A local display is provided.

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

User entry 0.0 to 999.9 s

Factory setting 0.0 s

Additional information *User entry*

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

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



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

Header

Navigation   Expert → System → Display → Header (0097)

Prerequisite A local display is provided.

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

Selection

- Device tag
- Free text

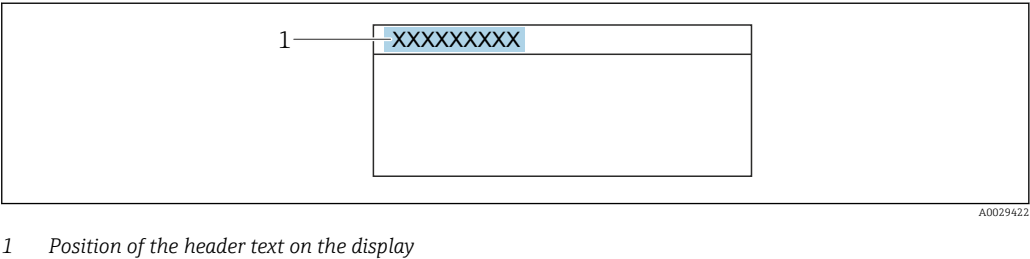
Factory setting Device tag

¹⁾ proportional transmission behavior with first order delay

Additional information

Description

The header text only appears during normal operation.



- Selection
- Device tag
Is defined in the **Device tag** parameter (→ ⓘ 203).
 - Free text
Is defined in the **Header text** parameter (→ ⓘ 29).

Header text

ⓘ

Navigation

🔍📄 Expert → System → Display → Header text (0112)

Prerequisite

In the **Header** parameter (→ ⓘ 28), the **Free text** option is selected.

Description

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

User entry

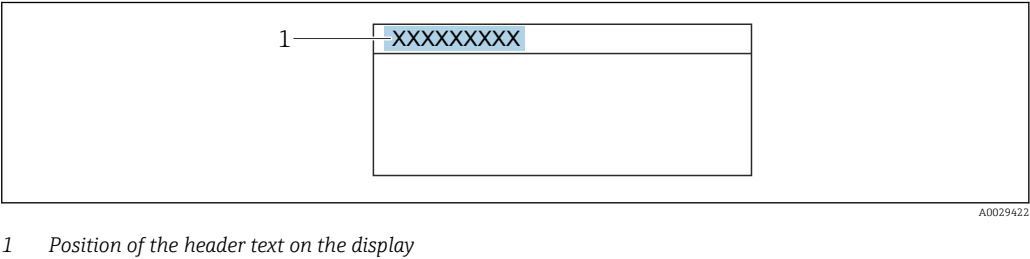
Max. 12 characters such as letters, numbers or special characters (e.g. @, %, /)

Factory setting

Additional information

Description

The header text only appears during normal operation.



User entry

The number of characters displayed depends on the characters used.

Separator

Navigation   Expert → System → Display → Separator (0101)

Prerequisite A local display is provided.

Description Use this function to select the decimal separator.

Selection

- . (point)
- , (comma)

Factory setting . (point)

Contrast display

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

Prerequisite A local display is provided.

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

User entry 20 to 80 %

Factory setting Depends on the display

Backlight

Navigation   Expert → System → Display → Backlight (0111)

Prerequisite One of the following conditions is met:

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

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

Selection

- Disable
- Enable

Factory setting Enable

3.1.2 "Configuration backup" submenu

Navigation  Expert → System → Config. backup

► Config. backup		
Operating time	→ 	31
Last backup	→ 	31
Config. managem.	→ 	31
Backup state	→ 	32
Compar. result	→ 	33

Operating time

Navigation	 Expert → System → Config. backup → Operating time (0652)
Description	Use this function to display the length of time the device has been in operation.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<i>User interface</i> The maximum number of days is 9999, which is equivalent to 27 years.

Last backup

Navigation	 Expert → System → Config. backup → Last backup (2757)
Description	Displays the time since a backup copy of the data was last saved to the device memory.
User interface	Days (d), hours (h), minutes (m) and seconds (s)

Config. managem.

Navigation	 Expert → System → Config. backup → Config. managem. (2758)
Description	Use this function to select an action to save the data to the device memory.

Selection

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

Factory setting

Cancel

Additional information*Selection*

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

HistoROM

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

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

Displays the status of the data backup process.

User interface

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

Factory setting

None

Compar. result

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

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

User interface

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

Factory setting

Check not done

Additional information*Description*

The comparison is started via the **Compare** option in the **Config. managem.** parameter (→  31).

Selection

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

HistoROM

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

3.1.3 "Diagn. handling" submenu

Navigation  Expert → System → Diagn. handling

► Diagn. handling

Alarm delay (0651) →  34

► Diagn. behavior →  34

Alarm delay

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

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

 The diagnostic message is reset without a time delay.

User entry 0 to 60 s

Factory setting 0 s

Additional information *Result*
This setting affects the following diagnostic messages:

- 046 Sensor limit
- 140 Sensor sig.asym.
- 144 MeasErrorTooHigh
- 830 Sensor temp.
- 831 Sensor temp.
- 832 Electronic temp.
- 833 Electronic temp.
- 834 Process temp.
- 835 Process temp.
- 843 Process limit
- 862 Partly filled
- 912 Medium inhomog.
- 913 Medium unsuitab.
- 944 MonitoringFailed

"Diagn. behavior" submenu

Each item of diagnostic information is assigned a specific diagnostic behavior at the factory. The user can change this assignment for specific diagnostic information in the **Diagn. behavior** submenu (→  34).

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

Diagnostic behavior	Description
Alarm	The device stops measurement. The totalizers assume the defined alarm condition. A diagnostic message is generated.
Warning	The device continues to measure. The measured value output via PROFINET and the totalizers are not affected. A diagnostic message is generated.
Logbook only	The device continues to measure. The diagnostic message is displayed only in the Event logbook submenu (→  200) (Event list submenu (→  201)) and not in alternation with the operational display.
Off	The diagnostic event is ignored, and no diagnostic message is generated or entered.



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

Navigation



Expert → System → Diagn. handling → Diagn. behavior

► Diagn. behavior		
Diagnostic no. 046 (0709)		→  36
Diagnostic no. 140 (0708)		→  36
Diagnostic no. 144 (0731)		→  37
Diagnostic no. 374 (0710)		→  37
Diagnostic no. 302 (0739)		→  37
Diagnostic no. 441 (0657)		→  38
Diagnostic no. 442 (0658)		→  38
Diagnostic no. 443 (0659)		→  38
Diagnostic no. 444 (0740)		→  39
Diagnostic no. 830 (0800)		→  39
Diagnostic no. 831 (0641)		→  39
Diagnostic no. 832 (0681)		→  40
Diagnostic no. 833 (0682)		→  40
Diagnostic no. 834 (0700)		→  41
Diagnostic no. 835 (0702)		→  41

Diagnostic no. 862 (0679)	→ 41
Diagnostic no. 912 (0703)	→ 42
Diagnostic no. 913 (0712)	→ 42
Diagnostic no. 944 (0732)	→ 42
Diagnostic no. 948 (0744)	→ 43

Diagnostic no. 046 (Sensor limit)

Navigation	  Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 046 (0709)
Description	Option for changing the diagnostic behavior of the diagnostic message 046 Sensor limit .
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Alarm
Additional information	 For a detailed description of the options available, see

Diagnostic no. 140 (Sensor sig.asym.)

Navigation	  Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 140 (0708)
Description	Use this function to change the diagnostic behavior of the diagnostic message 140 Sensor sig.asym..
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Alarm
Additional information	 For a detailed description of the options available, see

Diagnostic no. 144 (MeasErrorTooHigh)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 144 (0731)
Description	Option for changing the diagnostic behavior of the diagnostic message 144 MeasErrorTooHigh .
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Alarm
Additional information	For a detailed description of the options available, see

Diagnostic no. 374 (Sensor electron.)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 374 (0710)
Description	Option for changing the diagnostic behavior of the diagnostic message 374 Sensor electron..
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Warning
Additional information	For a detailed description of the options available, see

Diagnostic no. 302 (Verific. active)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 302 (0739)
Description	Use this function to change the diagnostic behavior of the diagnostic message 302 Verific. active .
Selection	■ Alarm ■ Warning
Factory setting	Warning
Additional information	For a detailed description of the options available, see

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



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 441 (0657)
Description	Use this function to change the diagnostic behavior of the diagnostic message 441 Curr.output 1 to n .
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Warning
Additional information	For a detailed description of the options available, see

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



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 442 (0658)
Prerequisite	The measuring device has a pulse/frequency/switch output.
Description	Use this function to change the diagnostic behavior of the diagnostic message 442 Freq. output 1 to n .
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Warning
Additional information	For a detailed description of the options available, see

Diagnostic no. 443 (Pulse output 1 to n)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 443 (0659)
Prerequisite	The measuring device has a pulse/frequency/switch output.
Description	Use this function to change the diagnostic behavior of the diagnostic message 443 Pulse output 1 to n .
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only

Factory setting Warning

Additional information  For a detailed description of the options available, see

Diagnostic no. 444 (Current input 1 to n)



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

Prerequisite The device has one current input.

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

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information  For a detailed description of the options available, see

Diagnostic no. 830 (Sensor temp.)



Navigation  Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 830 (0800)

Description Use this function to change the diagnostic behavior of the diagnostic message **830 Sensor temp..**

Selection

- Off
- Alarm
- Warning
- Logbook only

Factory setting Warning

Additional information  For a detailed description of the options available, see

Diagnostic no. 831 (Sensor temp.)



Navigation  Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 831 (0641)

Description Use this function to change the diagnostic behavior of the diagnostic message **831 Sensor temp..**

Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Warning
Additional information	 For a detailed description of the options available, see

Diagnostic no. 832 (Electronic temp.)

Navigation	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 832 (0681)
Description	Use this function to change the diagnostic behavior of the diagnostic message 832 Electronic temp..
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Logbook only
Additional information	 For a detailed description of the options available, see

Diagnostic no. 833 (Electronic temp.)

Navigation	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 833 (0682)
Description	Use this function to change the diagnostic behavior of the diagnostic message 833 Electronic temp..
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Logbook only
Additional information	 For a detailed description of the options available, see

Diagnostic no. 834 (Process temp.)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 834 (0700)
Description	Use this function to change the diagnostic behavior of the diagnostic message 834 Process temp. .
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Warning
Additional information	For a detailed description of the options available, see

Diagnostic no. 835 (Process temp.)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 835 (0702)
Description	Use this function to change the diagnostic behavior of the diagnostic message 835 Process temp. .
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Warning
Additional information	For a detailed description of the options available, see

Diagnostic no. 862 (Empty pipe)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 862 (0679)
Description	Use this function to change the diagnostic behavior of the diagnostic message 862 Empty pipe.
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Warning
Additional information	For a detailed description of the options available, see

Diagnostic no. 912 (Medium inhomog.)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 912 (0703)
Description	Option for changing the diagnostic behavior of the diagnostic message 912 Medium inhomog..
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Warning
Additional information	For a detailed description of the options available, see

Diagnostic no. 913 (Medium unsuitab.)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 913 (0712)
Description	Option for changing the diagnostic behavior of the diagnostic message 913 Medium unsuitab..
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Warning
Additional information	For a detailed description of the options available, see

Diagnostic no. 944 (MonitoringFailed)



Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 944 (0732)
Description	Option for changing the diagnostic behavior of the diagnostic message 944 MonitoringFailed.
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only
Factory setting	Warning
Additional information	For a detailed description of the options available, see

Diagnostic no. 948 (Oscill. damping)		
Navigation	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 948 (0744)	
Description	Option for changing the diagnostic behavior of the diagnostic message 948 Oscill. damping .	
Selection	■ Off ■ Alarm ■ Warning ■ Logbook only	
Factory setting	Warning	
Additional information	For a detailed description of the options available, see	

3.1.4 "Administration" submenu

Navigation Expert → System → Administration

▶ Administration		
▶ Def. access code	→	43
▶ Reset acc. code	→	45
Device reset	→	46
Activate SW opt.	→	46
SW option overv.	→	47

"Def. access code" wizard

The **Def. access code** wizard (→ 43) is only available when operating via the local display or Web browser.

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

Navigation  Expert → System → Administration → Def. access code

► Def. access code

Def. access code

Confirm code

→  44

→  44

Def. access code

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

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

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

Additional information *Description*
The write protection affects all parameters in the document marked with the  symbol.
On the local display, the  symbol in front of a parameter indicates that the parameter is write-protected.
The parameters that cannot be write-accessed are grayed out in the Web browser.
 Once the access code has been defined, write-protected parameters can only be modified if the access code is entered in the **Ent. access code** parameter (→  13).
 If you lose the access code, please contact your Endress+Hauser sales organization.

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

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

Confirm code

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

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

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

"Reset access code" submenu

Navigation  Expert → System → Administration → Reset acc. code

▶ Reset acc. code

Operating time (0652)

→  45

Reset acc. code (0024)

→  45

Operating time

Navigation	 Expert → System → Administration → Reset acc. code → Operating time (0652)
Description	Use this function to display the length of time the device has been in operation.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<i>User interface</i> The maximum number of days is 9999, which is equivalent to 27 years.

Reset acc. code

Navigation	 Expert → System → Administration → Reset acc. code → Reset acc. code (0024)
Description	Use this function to enter a reset code to reset the user-specific release code to the factory setting.
User entry	Character string comprising numbers, letters and special characters
Factory setting	0x00
Additional information	<i>Description</i>  For a reset code, contact your Endress+Hauser service organization. <i>User entry</i> The reset code can only be entered via: ■ Web browser ■ DeviceCare, FieldCare (via interface CDI RJ45) ■ Fieldbus

Additional parameters in the "Administration" submenu

Device reset

Navigation

Expert → System → Administration → Device reset (0000)

Description

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

Selection

■ Cancel

■ To delivery set.

■ Restart device

■ Rest.S-DATBackup

Factory setting

Cancel

Additional information

Selection

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

Activate SW opt.

Navigation

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

Description

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

User entry

Max. 10-digit string consisting of numbers.

Factory setting

Depends on the software option ordered

Additional information

Description

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

User entry

i

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

NOTE!

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

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

- ▶ Before you enter a new activation code, make a note of the current activation code .
- ▶ Enter the new activation code provided by Endress+Hauser when the new software option was ordered.
- ▶ Once the activation code has been entered, check if the new software option is displayed in the **SW option overv.** parameter (→  47).
- ↳ The new software option is active if it is displayed.
- ↳ If the new software option is not displayed or all software options have been deleted, the code entered was either incorrect or invalid.
- ▶ If the code entered is incorrect or invalid, enter the old activation code .
- ▶ Have your Endress+Hauser sales organization check the new activation code remembering to specify the serial number or ask for the code again.

Example for a software option

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

 The software options currently enabled are displayed in the **SW option overv.** parameter (→  47).

Web browser

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

SW option overv.

Navigation	  Expert → System → Administration → SW option overv. (0015)
Description	Displays all the software options that are enabled in the device.
User interface	■ Extend. HistoROM ■ HBT Monitoring ■ HBT Verification ■ Concentration ■ Petroleum ■ Viscosity ■ HydrocaViscTrend

Additional information

Description

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

"Extend. HistoROM" option

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

"HBT Verification" option and "HBT Monitoring" option

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

"Concentration" option

Order code for "Application package", option **ED** "Concentration" and option **EE** "Special density"

"Viscosity" option

 Only available for Promass I.

Order code for "Application package", option **EG** "Viscosity"

3.2 "Sensor" submenu

Navigation

 Expert → Sensor

► Sensor	
► Measured val.	→  49
► System units	→  63
► Process param.	→  79
► Measurement mode	→  87
► External comp.	→  89
► Calculated value	→  94
► Sensor adjustm.	→  98
► Calibration	→  106

3.2.1 "Measured values" submenu

Navigation  Expert → Sensor → Measured val.

► Measured val.		
► Process variab.	→ 	49
► Totalizer	→ 	56
► Input values	→ 	58
► Output values	→ 	59

"Process variab." submenu

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

► Process variab.		
Mass flow (1838)	→ 	50
Volume flow (1847)	→ 	50
Correct.vol.flow (1851)	→ 	50
Density (1850)	→ 	51
Ref.density (1852)	→ 	51
Temperature (1853)	→ 	51
Pressure value (6129)	→ 	52
Dynam. viscosity (1854)	→ 	52
Kinematic visc. (1857)	→ 	52
TempCompDynVisc (1872)	→ 	53
TempCompKinVisc (1863)	→ 	53
Concentration (1887)	→ 	53
Target mass flow (1864)	→ 	54
Carrier mass fl. (1865)	→ 	54
Targ.corr.vol.fl (1893)	→ 	55

Carr.corr.vol.fl (1894)	→ ⓘ 55
Target vol. flow (1895)	→ ⓘ 55
Carrier vol. fl. (1896)	→ ⓘ 56

Mass flow

Navigation	🔍📄 Expert → Sensor → Measured val. → Process variab. → Mass flow (1838)
Description	Displays the mass flow that is currently measured.
User interface	Signed floating-point number
Additional information	<i>Dependency</i> ⓘ The unit is taken from the Mass flow unit parameter (→ ⓘ 63)

Volume flow

Navigation	🔍📄 Expert → Sensor → Measured val. → Process variab. → Volume flow (1847)
Description	Displays the volume flow currently calculated.
User interface	Signed floating-point number
Additional information	<i>Description</i> The volume flow is calculated from the mass flow currently measured and the density currently measured. <i>Dependency</i> ⓘ The unit is taken from the Volume flow unit parameter (→ ⓘ 65)

Correct.vol.flow

Navigation	🔍📄 Expert → Sensor → Measured val. → Process variab. → Correct.vol.flow (1851)
Description	Displays the corrected volume flow currently measured.
User interface	Signed floating-point number

Additional information*Dependency*The unit is taken from the **Cor.volf flow unit** parameter (→ 66)

Density

Navigation

Expert → Sensor → Measured val. → Process variab. → Density (1850)

Description

Displays the density currently measured.

User interface

Signed floating-point number

Additional information*Dependency*The unit is taken from the **Density unit** parameter (→ 68)

Ref.density

Navigation

Expert → Sensor → Measured val. → Process variab. → Ref.density (1852)

Description

Displays the reference density currently calculated.

User interface

Signed floating-point number

Additional information*Dependency*The unit is taken from the **Ref. dens. unit** parameter (→ 69)

Temperature

Navigation

Expert → Sensor → Measured val. → Process variab. → Temperature (1853)

Description

Displays the medium temperature currently measured.

User interface

Signed floating-point number

Additional information*Dependency*The unit is taken from the **Temperature unit** parameter (→ 69)

Pressure value

Navigation	 Expert → Sensor → Measured val. → Process variab. → Pressure value (6129)
Description	Displays the fixed or external pressure value.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Pressure unit parameter (→  70)

Dynam. viscosity

Navigation	 Expert → Sensor → Measured val. → Process variab. → Dynam. viscosity (1854)
Prerequisite	For the following order code: "Application package", option EG "Viscosity"  The software options currently enabled are displayed in the SW option overv. parameter (→  47).
Description	Displays the dynamic viscosity currently calculated.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Dyn. visc. unit parameter.

Kinematic visc.

Navigation	 Expert → Sensor → Measured val. → Process variab. → Kinematic visc. (1857)
Prerequisite	For the following order code: "Application package", option EG "Viscosity"  The software options currently enabled are displayed in the SW option overv. parameter (→  47).
Description	Displays the kinematic viscosity currently calculated.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Kin. visc. unit parameter (0578).

TempCompDynVisc

Navigation	 Expert → Sensor → Measured val. → Process variab. → TempCompDynVisc (1872)
Prerequisite	For the following order code: "Application package", option EG "Viscosity"  The software options currently enabled are displayed in the SW option overv. parameter (→  47).
Description	Displays the temperature compensation currently calculated for the viscosity.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Dyn. visc. unit parameter.

TempCompKinVisc

Navigation	 Expert → Sensor → Measured val. → Process variab. → TempCompKinVisc (1863)
Prerequisite	For the following order code: "Application package", option EG "Viscosity"  The software options currently enabled are displayed in the SW option overv. parameter (→  47).
Description	Displays the temperature compensation currently calculated for the kinetic viscosity.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Kin. visc. unit parameter (0578).

Concentration

Navigation	 Expert → Sensor → Measured val. → Process variab. → Concentration (1887)
Prerequisite	For the following order code: "Application package", option ED "Concentration"  The software options currently enabled are displayed in the SW option overv. parameter (→  47).
Description	Displays the concentration currently calculated.
User interface	Signed floating-point number

Additional information*Dependency*

The unit is taken from the **Concentr. unit** parameter (0613).

Target mass flow**Navigation**

Expert → Sensor → Measured val. → Process variab. → Target mass flow (1864)

Prerequisite

With the following conditions:

- Order code for "Application package", option **ED** "Concentration"
- The **WT-%** option or the **User conc.** option is selected in the **Concentr. unit** parameter.



The software options currently enabled are displayed in the **SW option overv.** parameter (→ 47).

Description

Displays the mass flow currently measured for the target medium.

User interface

Signed floating-point number

Additional information*Dependency*

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

Carrier mass fl.**Navigation**

Expert → Sensor → Measured val. → Process variab. → Carrier mass fl. (1865)

Prerequisite

With the following conditions:

- Order code for "Application package", option **ED** "Concentration"
- The **WT-%** option or the **User conc.** option is selected in the **Concentr. unit** parameter.



The software options currently enabled are displayed in the **SW option overv.** parameter (→ 47).

Description

Displays the mass flow currently measured for the carrier medium.

User interface

Signed floating-point number

Additional information*Dependency*

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

Targ.corr.vol.fl

Navigation	 Expert → Sensor → Measured val. → Process variab. → Targ.corr.vol.fl (1893)
Prerequisite	With the following conditions: ▪ Order code for "Application package", option ED "Concentration" ▪ The WT-% option or the User conc. option is selected in the Concentr. unit parameter.  The software options currently enabled are displayed in the SW option overv. parameter (→  47).
Description	Displays the corrected volume flow currently measured for the target fluid.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Volume flow unit parameter (→  65)

Carr.corr.vol.fl

Navigation	 Expert → Sensor → Measured val. → Process variab. → Carr.corr.vol.fl (1894)
Prerequisite	With the following conditions: ▪ Order code for "Application package", option ED "Concentration" ▪ The WT-% option or the User conc. option is selected in the Concentr. unit parameter.  The software options currently enabled are displayed in the SW option overv. parameter (→  47).
Description	Displays the corrected volume flow currently measured for the carrier fluid.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Volume flow unit parameter (→  65)

Target vol. flow

Navigation	 Expert → Sensor → Measured val. → Process variab. → Target vol. flow (1895)
Prerequisite	With the following conditions: ▪ Order code for "Application package", option ED "Concentration" ▪ The WT-% option or the User conc. option is selected in the Concentr. unit parameter.  The software options currently enabled are displayed in the SW option overv. parameter (→  47).
Description	Displays the volume flow currently measured for the target fluid.

User interfaceSigned floating-point number

Additional informationDependency

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

Carrier vol. fl.

Navigation Expert → Sensor → Measured val. → Process variab. → Carrier vol. fl. (1896)

Prerequisite

With the following conditions:

- Order code for "Application package", option **ED** "Concentration"
- The **WT-%** option or the **User conc.** option is selected in the **Concentr. unit** parameter.

 The software options currently enabled are displayed in the **SW option overv.** parameter (→  47).

DescriptionDisplays the volume flow currently measured for the carrier fluid.

User interfaceSigned floating-point number

Additional informationDependency

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

"Totalizer" submenu

Navigation Expert → Sensor → Measured val. → Totalizer

► Totalizer

Totalizer val. 1 to n (0911–1 to n)

→  56

Tot. overflow 1 to n (0910–1 to n)

→  57

Totalizer val. 1 to n

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

Prerequisite

A process variable is selected in the **Assign variable** parameter (→  187) of the **Totalizer 1 to n** submenu.

DescriptionDisplays the current totalizer reading.

User interfaceSigned floating-point number

Additional information*Description*

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

 In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→  191).

User interface

The value of the process variable totalized since measuring began can be positive or negative. This depends on the settings in the **Operation mode** parameter (→  189).

 The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→  188).

Example

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

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

Tot. overflow 1 to n**Navigation**

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

Prerequisite

A process variable is selected in the **Assign variable** parameter (→  187) of the **Totalizer 1 to n** submenu.

Description

Displays the current totalizer overflow.

User interface

Integer with sign

Additional information*Description*

If the current totalizer reading exceeds 7 digits, which is the maximum value range that can be displayed by the operating tool, the value above this range is output as an overflow. The current totalizer value is therefore the sum of the overflow value and the totalizer value from the **Totalizer val. 1 to n** parameter.

User interface

 The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→  188).

Example

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

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

"Input values" submenu

Navigation  Expert → Sensor → Measured val. → Input values

► Input values

► Current input 1 to n

→  58

► Val.stat.inp. 1 to n

→  59

"Current input 1 to n" submenu

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

► Current input 1 to n

Measured val. 1 to n (1603–1 to n)

→  58

Measur. curr. 1 to n (1604–1 to n)

→  58

Measured val. 1 to n

Navigation	 Expert → Sensor → Measured val. → Input values → Current input 1 to n → Measured val. 1 to n (1603–1 to n)
Description	Displays the current input value.
User interface	Signed floating-point number

Measur. curr. 1 to n

Navigation	 Expert → Sensor → Measured val. → Input values → Current input 1 to n → Measur. curr. 1 to n (1604–1 to n)
Description	Displays the current value of the current input.
User interface	0 to 22.5 mA

"Value status input 1 to n" submenu

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

► Val.stat.inp. 1 to n

Val.stat.inp. (1353-1 to n) →  59

Val.stat.inp.

Navigation	  Expert → Sensor → Measured val. → Input values → Val.stat.inp. 1 to n → Val.stat.inp. (1353-1 to n)
Description	Displays the current input signal level.
User interface	■ High ■ Low

"Output values" submenu

Navigation   Expert → Sensor → Measured val. → Output values

► Output values

► Value curr.out 1 to n →  59

► PFS output 1 to n →  60

► Relay output 1 to n →  62

"Value current output 1 to n" submenu

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

► Value curr.out 1 to n

Output curr. 1 to n (0361-1 to n) →  60

Measur. curr. 1 to n (0366-1 to n) →  60

Output curr. 1 to n

Navigation	 Expert → Sensor → Measured val. → Output values → Value curr.out 1 to n → Output curr. 1 to n (0361–1 to n)
Description	Displays the current value currently calculated for the current output.
User interface	0 to 22.5 mA

Measur. curr. 1 to n

Navigation	 Expert → Sensor → Measured val. → Output values → Value curr.out 1 to n → Measur. curr. 1 to n (0366–1 to n)
Description	Use this function to display the actual measured value of the output current.
User interface	0 to 30 mA

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

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

Output freq. 1 to n (0471–1 to n)

→  60

Pulse output 1 to n (0456–1 to n)

→  61

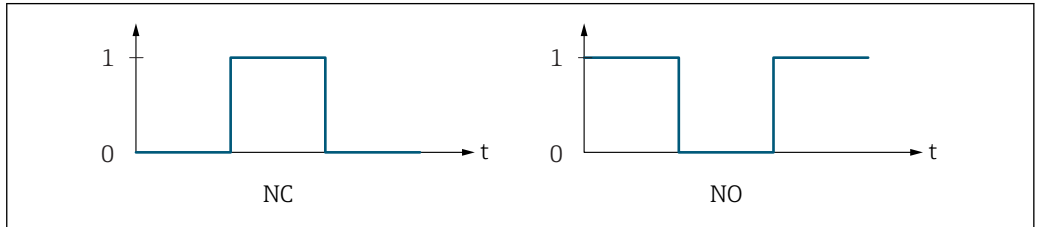
Switch status 1 to n (0461–1 to n)

→  61

Output freq. 1 to n

Navigation	 Expert → Sensor → Measured val. → Output values → PFS output 1 to n → Output freq. 1 to n (0471–1 to n)
Prerequisite	In the Operating mode parameter (→  133), the Frequency option is selected.
Description	Displays the actual value of the output frequency which is currently measured.
User interface	0.0 to 12 500.0 Hz

Pulse output 1 to n

Navigation	 Expert → Sensor → Measured val. → Output values → PFS output 1 to n → Pulse output 1 to n (0456-1 to n)
Prerequisite	In the Operating mode parameter (→  133), the Pulse option is selected.
Description	Displays the pulse frequency currently output.
User interface	Positive floating-point number
Additional information	<i>Description</i> ■ The pulse output is an open collector output. ■ This is configured at the factory in such a way that the transistor is conductive for the duration of the pulse (NO contact) and is safety-oriented.  <i>0 Non-conductive</i> <i>1 Conductive</i> <i>NC NC contact (normally closed)</i> <i>NO NO contact (normally open)</i> The output behavior can be reversed via the Invert outp.sig. parameter (→  157) i.e. the transistor does not conduct for the duration of the pulse. In addition, the behavior of the output in the event of a device alarm (Failure mode parameter (→  138)) can be configured.

Switch status 1 to n

Navigation	 Expert → Sensor → Measured val. → Output values → PFS output 1 to n → Switch status 1 to n (0461-1 to n)
Prerequisite	The Switch option is selected in the Operating mode parameter (→  133).
Description	Displays the current switch status of the status output.
User interface	■ Open ■ Closed

Additional information

User interface

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

"Relay output 1 to n" submenu

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

► Relay output 1 to n

Switch status (0801–1 to n)

→  62

Switch cycles (0815–1 to n)

→  62

Max. cycles no. (0817–1 to n)

→  63

Switch status

Navigation  Expert → Sensor → Measured val. → Output values → Relay output 1 to n → Switch status (0801–1 to n)

Description Displays the current status of the relay output.

User interface

- Open
- Closed

Additional information

User interface

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

Switch cycles

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

Description Displays all the switch cycles performed.

User interface Positive integer

Max. cycles no.

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

3.2.2 "System units" submenu

Navigation   Expert → Sensor → System units

► System units		
Mass flow unit (0554)	→ 	63
Mass unit (0574)	→ 	64
Volume flow unit (0553)	→ 	65
Volume unit (0563)	→ 	66
Cor.volflow unit (0558)	→ 	66
Corr. vol. unit (0575)	→ 	67
Density unit (0555)	→ 	68
Ref. dens. unit (0556)	→ 	69
Temperature unit (0557)	→ 	69
Pressure unit (0564)	→ 	70
Date/time format (2812)	→ 	70

Mass flow unit



Navigation	  Expert → Sensor → System units → Mass flow unit (0554)
Description	Use this function to select the unit for the mass flow.

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

Factory setting	Country-specific:
	■ kg/h (DN > 150 (6")): t/h ■ lb/min

Additional information	<i>Result</i>
	The selected unit applies for: ■ Target mass flow parameter (→ ⓘ 54) ■ Carrier mass fl. parameter (→ ⓘ 54) ■ Mass flow parameter (→ ⓘ 50)
	<i>Selection</i>

 For an explanation of the abbreviated units: → ⓘ 248

Mass unit

Navigation	  Expert → Sensor → System units → Mass unit (0574)	
Description	Use this function to select the unit for the mass.	
Selection	<i>SI units</i>	<i>US units</i>
	■ g ■ kg ■ t	■ oz ■ lb ■ STon
Factory setting	Country-specific: ■ kg (DN > 150 (6")): t ■ lb	
Additional information	<i>Selection</i>  For an explanation of the abbreviated units: →  248	

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

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

Selection*SI units*

- 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;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;oil)
- bbl/min (imp;oil)
- bbl/h (imp;oil)
- bbl/d (imp;oil)

or

US units

- 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)

Imperial units

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

Factory setting

Country-specific:

- l/h (DN > 150 (6")): m³/h
- gal/min (us)

Additional information	<i>Result</i> The selected unit applies for: Volume flow parameter (→ ⓘ 50) <i>Selection</i> ⓘ For an explanation of the abbreviated units: → ⓘ 248
Volume unit	ⓘ

Navigation	 Expert → Sensor → System units → Volume unit (0563)		
Description	Use this function to select the unit for the volume.		
Selection	<i>SI units</i> ■ cm³ ■ dm³ ■ m³ ■ ml ■ l ■ hl ■ Ml Mega	<i>US units</i> ■ af ■ ft³ ■ fl oz (us) ■ gal (us) ■ kgal (us) ■ Mgal (us) ■ bbl (us;oil) ■ bbl (us;tank)	<i>Imperial units</i> ■ gal (imp) ■ Mgal (imp) ■ bbl (imp;oil)
	or		
	<i>US units</i> ■ bbl (us;liq.) ■ bbl (us;beer)	<i>Imperial units</i> ■ bbl (imp;beer)	
Factory setting	Country-specific: ■ l (DN > 150 (6"): m³) ■ gal (us)		
Additional information	<i>Selection</i>  For an explanation of the abbreviated units: →  248		

Cor.volflow unit	ⓘ
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Navigation	🔍📄 Expert → Sensor → System units → Cor.volflow unit (0558)
Description	Use this function to select the unit for the corrected volume flow.

Selection	<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
	■ NI/s	■ Sft ³ /s	■ Sgal/s (imp)
	■ NI/min	■ Sft ³ /min	■ Sgal/min (imp)
	■ NI/h	■ Sft ³ /h	■ Sgal/h (imp)
	■ NI/d	■ Sft ³ /d	■ Sgal/d (imp)
	■ Nm ³ /s	■ Sgal/s (us)	
	■ Nm ³ /min	■ Sgal/min (us)	
	■ Nm ³ /h	■ Sgal/h (us)	
	■ Nm ³ /d	■ Sgal/d (us)	
	■ Sm ³ /s	■ Sbbbl/s (us;liq.)	
	■ Sm ³ /min	■ Sbbbl/min (us;liq.)	
	■ Sm ³ /h	■ Sbbbl/h (us;liq.)	
	■ Sm ³ /d	■ Sbbbl/d (us;liq.)	

Factory setting	Country-specific: ■ NI/h (DN > 150 (6"): Nm ³ /h) ■ Sft ³ /min
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Additional information	<i>Result</i> The selected unit applies for: Correct.vol.flow parameter (→  50) <i>Selection</i>  For an explanation of the abbreviated units: →  248
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Corr. vol. unit

Navigation	  Expert → Sensor → System units → Corr. vol. unit (0575)		
Description	Use this function to select the unit for the corrected volume.		
Selection	<i>SI units</i> ■ NI ■ Nm ³ ■ Sm ³	<i>US units</i> ■ Sft ³ ■ Sgal (us) ■ Sbbbl (us;liq.)	<i>Imperial units</i> Sgal (imp)
Factory setting	Country-specific: ■ NI (DN > 150 (6"): Nm ³) ■ Sft ³		
Additional information	<i>Selection</i>  For an explanation of the abbreviated units: →  248		

Density unit	
Navigation	Expert → Sensor → System units → Density unit (0555)
Description	Use this function to select the unit for the density.
Selection	<i>SI units</i> ■ g/cm³ ■ g/m³ ■ g/ml ■ kg/l ■ kg/dm³ ■ kg/m³ ■ SD4°C ■ SD15°C ■ SD20°C ■ SG4°C ■ SG15°C ■ SG20°C <i>US units</i> ■ lb/ft³ ■ lb/gal (us) ■ lb/bbl (us;oil) ■ lb/bbl (us;tank) <i>Imperial units</i> ■ lb/gal (imp) ■ lb/bbl (imp;oil) or <i>US units</i> - SG60°F <i>Other units</i> °API Other units °API or <i>US units</i> ■ lb/bbl (us;liq.) ■ lb/bbl (us;beer) <i>Imperial units</i> - lb/bbl (imp;beer)
Factory setting	Country-specific: ■ kg/l ■ lb/ft³
Additional information	<i>Result</i> The selected unit applies for: ■ Density setpt 1 parameter ■ Density setpt 2 parameter ■ Density parameter (→ 51) <i>Selection</i> ■ SD = specific density The specific density is the ratio of the medium density to the water density at a water temperature of +4 °C (+39 °F), +15 °C (+59 °F), +20 °C (+68 °F). ■ SG = specific gravity The specific gravity is the ratio of the medium density to the water density at a water temperature of +4 °C (+39 °F), +15 °C (+59 °F), +20 °C (+68 °F). For an explanation of the abbreviated units: → 248

Ref. dens. unit



Navigation

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

Description

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

Selection

SI units

- kg/Nm³
- kg/Nl
- g/Scm³
- kg/Sm³
- RD15°C
- RD20°C

US units

- lb/Sft³
- RD60°F

Other units

°APIbase

Factory setting

Country-dependent

- kg/Nl
- lb/Sft³

Additional information

Result

The selected unit applies for:

- **Ext. ref.density** parameter (→ 95)
- **Fix ref.density** parameter (→ 96)
- **Ref.density** parameter (→ 51)

Selection

For an explanation of the abbreviated units: → 248

Temperature unit



Navigation

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

Description

Use this function to select the unit for the temperature.

Selection

SI units

- °C
- K

US units

- °F
- °R

Factory setting

Country-specific:

- °C
- °F

Additional information

Result

The selected unit applies for:

- **Maximum value** parameter (→ 214)
- **Minimum value** parameter (→ 214)
- **Maximum value** parameter (→ 215)
- **Minimum value** parameter (→ 214)
- **Maximum value** parameter (→ 216)
- **Minimum value** parameter (→ 215)
- **External temp.** parameter (→ 93)

- **Ref. temperature** parameter (6222)
- **Temperature** parameter (→ ⓘ 51)
- **Ref. temperature** parameter (→ ⓘ 97)

Selection

 For an explanation of the abbreviated units: → ⓘ 248

Pressure unit

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

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

Selection	SI units	US units
	■ Pa a ■ kPa a ■ MPa a ■ bar ■ Pa g ■ kPa g ■ MPa g ■ bar g	■ psi a ■ psi g

Factory setting Country-specific:

- bar a
- psi a

Additional information *Result*
The unit is taken from:

- **Pressure value** parameter (→ ⓘ 90)
- **External press.** parameter (→ ⓘ 91)
- **Pressure value** parameter (→ ⓘ 52)

Selection

 For an explanation of the abbreviated units: → ⓘ 248

Date/time format

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

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

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

Factory setting dd.mm.yy hh:mm

Additional information*Selection*

For an explanation of the abbreviated units: → 248

"User-spec. units" submenu*Navigation*

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

► User-spec. units		
Volume text (0567)	→	72
Volume offset (0569)	→	72
Volume factor (0568)	→	73
Mass text (0560)	→	73
Mass offset (0562)	→	73
Mass factor (0561)	→	74
Corr. vol. text (0592)	→	74
Corr vol. offset (0602)	→	75
Cor.vol. factor (0590)	→	75
Density text (0570)	→	75
Density offset (0571)	→	76
Density factor (0572)	→	76
Spec. enth. text (0585)	→	76
Spec. enth. off. (0584)	→	77
Spec. enth. fac. (0583)	→	77
Energy text (0600)	→	77
Energy offset (0599)	→	78
Energy factor (0586)	→	78
Pressure text (0581)	→	78

Pressure offset (0580)	→  78
Pressure factor (0579)	→  79

Volume text

Navigation	  Expert → Sensor → System units → User-spec. units → Volume text (0567)
Description	Use this function to enter a text for the user-specific unit of volume and volume flow. The corresponding time units (s, min, h, d) for volume flow are generated automatically.
User entry	Max. 10 characters such as letters, numbers or special characters (@, %, /)
Factory setting	User vol.
Additional information	Result  The defined unit is shown as an option in the choose list of the following parameters: ▪ Volume flow unit parameter (→  65) ▪ Volume unit parameter (→  66) Example If the text GLAS is entered, the choose list of the Volume flow unit parameter (→  65) shows the following options: ▪ GLAS/s ▪ GLAS/min ▪ GLAS/h ▪ GLAS/d

Volume offset

Navigation	  Expert → Sensor → System units → User-spec. units → Volume offset (0569)
Description	Use this function to enter the offset for adapting the user-specific volume unit and volume flow unit (without time).
User entry	Signed floating-point number
Factory setting	0
Additional information	Description  Value in user-specific unit = (factor × value in base unit) + offset

Volume factor

Navigation	 Expert → Sensor → System units → User-spec. units → Volume factor (0568)
Description	Use this function to enter a quantity factor (without time) for the user-specific volume and volume flow unit.
User entry	Signed floating-point number
Factory setting	1.0

Mass text

Navigation	 Expert → Sensor → System units → User-spec. units → Mass text (0560)
Description	Use this function to enter a text for the user-specific unit of mass and mass flow. The corresponding time units (s, min, h, d) for mass flow are generated automatically.
User entry	Max. 10 characters such as letters, numbers or special characters (@, %, /)
Factory setting	User mass
Additional information	<i>Result</i>  The defined unit is shown as an option in the choose list of the following parameters: ■ Mass flow unit parameter (→  63) ■ Mass unit parameter (→  64) <i>Example</i> If the text CENT for "centner" is entered, the following options are displayed in the picklist for the Mass flow unit parameter (→  63): ■ CENT/s ■ CENT/min ■ CENT/h ■ CENT/d

Mass offset

Navigation	 Expert → Sensor → System units → User-spec. units → Mass offset (0562)
Description	Use this function to enter the zero point shift for the user-specific mass and mass flow unit.
User entry	Signed floating-point number
Factory setting	0

Additional information *Description*

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

Mass factor**Navigation**

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

Description

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

User entry

Signed floating-point number

Factory setting

1.0

Additional information*Example*

Mass of 1 Zentner = 50 kg → 0.02 Zentner = 1 kg → entry: 0.02

Corr. vol. text**Navigation**

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

Description

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

User entry

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

Factory setting

UserCrVol.

Additional information*Result*

The defined unit is shown as an option in the choose list of the following parameters:

- **Cor.volflow unit** parameter (→ 66)
- **Corr. vol. unit** parameter (→ 67)

Example

If the text GLAS is entered, the choose list of the **Cor.volflow unit** parameter (→ 66) shows the following options:

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

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

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

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

User entry

Signed floating-point number

Factory setting

0

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

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

User entry

Signed floating-point number

Factory setting

1.0

Density text**Navigation** Expert → Sensor → System units → User-spec. units → Density text (0570)**Description**

Use this function to enter a text or the user-specific unit of density.

User entry

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

Factory setting

User dens.

Additional information*Result*

 The defined unit is shown as an option in the choose list of the **Density unit** parameter (→  68).

Example

Enter text "CE_L" for centners per liter

Density offset

Navigation	 Expert → Sensor → System units → User-spec. units → Density offset (0571)
Description	Use this function to enter the zero point shift for the user-specific density unit.  Value in user-specific unit = (factor × value in base unit) + offset
User entry	Signed floating-point number
Factory setting	0

Density factor

Navigation	 Expert → Sensor → System units → User-spec. units → Density factor (0572)
Description	Use this function to enter a quantity factor for the user-specific density unit.
User entry	Signed floating-point number
Factory setting	1.0

Spec. enth. text

Navigation	 Expert → Sensor → System units → User-spec. units → Spec. enth. text (0585)
User entry	Max. 10 characters such as letters, numbers or special characters (@, %, /)
Factory setting	User enth.
Additional information	<i>Result</i> <i>Example</i> If the text CAL is entered, the choose list of the Cal. value unit parameter shows the following options: ■ CAL/Nm3 ■ CAL/m3 ■ CAL/ft3 ■ CAL/Sft3

Spec. enth. off.



Navigation	Expert → Sensor → System units → User-spec. units → Spec. enth. off. (0584)
Description	Use this function to enter the offset for adapting the user-specific calorific value unit (without volume).
User entry	Signed floating-point number
Factory setting	0

Spec. enth. fac.



Navigation	Expert → Sensor → System units → User-spec. units → Spec. enth. fac. (0583)
Description	Use this function to enter a quantity factor (without volume) for the user-specific calorific value unit.
User entry	Signed floating-point number
Factory setting	1.0
Additional information	<i>Example</i> $1 \text{ W} \times \text{min} = 60 \text{ J} \rightarrow 0.166 \text{ W} \times \text{min} = 1 \text{ J} \rightarrow \text{user entry: } 0.0166$

Energy text



Navigation	Expert → Sensor → System units → User-spec. units → Energy text (0600)
Description	Use this function to enter a text for the user-specific energy unit.
User entry	Max. 10 characters such as letters, numbers or special characters (@, %, /)
Factory setting	User en.
Additional information	<i>Result</i> The defined unit is shown as an option in the choose list of the following parameters: ■ Energy unit parameter ■ Energy flow unit parameter <i>Example</i> If the text W is entered, the choose list of the Energy flow unit parameter shows the following options: ■ W/s ■ W/min ■ W/h ■ W/d

Energy offset



Navigation	  Expert → Sensor → System units → User-spec. units → Energy offset (0599)
Description	Use this function to enter the offset for adapting the user-specific energy unit (without time).
User entry	Signed floating-point number
Factory setting	0

Energy factor



Navigation	  Expert → Sensor → System units → User-spec. units → Energy factor (0586)
Description	Use this function to enter a quantity factor for the user-specific energy unit.
User entry	Signed floating-point number
Factory setting	1.0

Pressure text



Navigation	  Expert → Sensor → System units → User-spec. units → Pressure text (0581)
Description	Use this function to enter a text for the user-specific pressure unit.
User entry	Max. 10 characters such as letters, numbers or special characters (@, %, /)
Factory setting	User pres.
Additional information	<i>Result</i>  The defined unit is shown as an option in the choose list of the Pressure unit parameter (→  70).

Pressure offset



Navigation	  Expert → Sensor → System units → User-spec. units → Pressure offset (0580)
Description	Use this function to enter the offset for adapting the user-specific pressure unit.
User entry	Signed floating-point number
Factory setting	0

Pressure factor		
Navigation	 Expert → Sensor → System units → User-spec. units → Pressure factor (0579)	
Description	Use this function to enter a quantity factor for the user-specific pressure unit.	
User entry	Signed floating-point number	
Factory setting	1.0	
Additional information	<i>Example</i> $1 \text{ Dyn/cm}^2 = 0.1 \text{ Pa} \rightarrow 10 \text{ Dyn/cm}^2 = 1 \text{ Pa} \rightarrow \text{user entry: } 10$	

3.2.3 "Process param." submenu

Navigation  Expert → Sensor → Process param.

► Process param.

Flow damping (1802)

Density damping (1803)

Temp. damping (1822)

Flow override (1839)

► Low flow cut off

► Partial pipe det

→  79

→  80

→  80

→  81

→  81

→  84

Flow damping		
Navigation	 Expert → Sensor → Process param. → Flow damping (1802)	
Description	Use this function to enter a time constant for flow damping (PT1 element). Reduction of the variability of the flow measured value (in relation to interference). For this purpose, the depth of the flow filter is adjusted: when the filter setting increases, the reaction time of the device also increases.	
User entry	0 to 100.0 s	
Factory setting	0 s	

Additional information	<i>Description</i>  The damping is performed by a PT1 element ²⁾. <i>User entry</i> ▪ Value = 0: no damping ▪ Value > 0: damping is increased  Damping is switched off if 0 is entered (factory setting). <i>Result</i>  The damping affects the following variables of the device: ▪ Outputs →  115 ▪ Low flow cut off →  81 ▪ Totalizers →  187
-------------------------------	--

Density damping

Navigation	  Expert → Sensor → Process param. → Density damping (1803)
Description	Use this function to enter a time constant for the damping (PT1 element) of the density measured value.
User entry	0 to 999.9 s
Factory setting	0 s
Additional information	<i>Description</i>  The damping is performed by a PT1 element ³⁾. <i>User entry</i> ▪ Value = 0: no damping ▪ Value > 0: damping is increased  Damping is switched off if 0 is entered (factory setting).

Temp. damping

Navigation	  Expert → Sensor → Process param. → Temp. damping (1822)
Description	Use this function to enter a time constant for the damping (PT1 element) of the temperature measured value.
User entry	0 to 999.9 s

2) Proportional behavior with first-order lag
3) Proportional behavior with first-order lag

Factory setting 0 s

Additional information *Description*

 The damping is performed by a PT1 element ⁴⁾.

User entry

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

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

Flow override

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

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

Selection

- Off
- On

Factory setting Off

Additional information *Description*

Flow override is active

- The diagnostic message diagnostic message  **C453 Flow override** is displayed.
- Output values
 - Temperature: proceeding output
 - Totalizers 1-3: Stop being totalized

 Positive zero return can also be enabled via the Status input: **Assign stat.inp.** parameter (→  114).

"Low flow cut off" submenu

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

▶ Low flow cut off

Assign variable (1837)

→  82

On value (1805)

→  82

⁴⁾ Proportional behavior with first-order lag

Off value (1804)	→ 82
Pres. shock sup. (1806)	→ 83

Assign variable

Navigation	Expert → Sensor → Process param. → Low flow cut off → Assign variable (1837)
Description	Use this function to select the process variable for low flow cutoff detection.
Selection	- Off - Mass flow - Volume flow - Correct.vol.flow
Factory setting	Mass flow

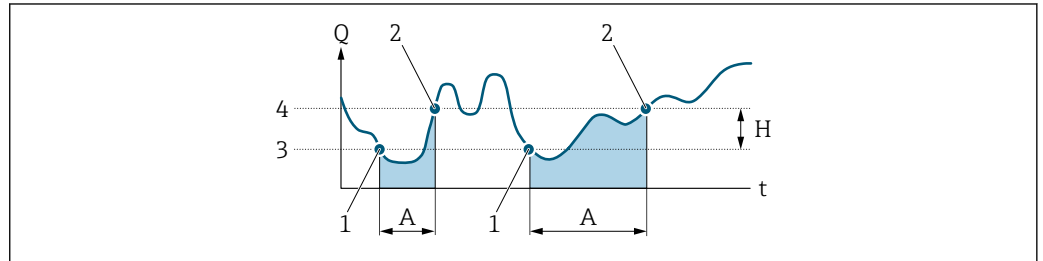
On value

Navigation	Expert → Sensor → Process param. → Low flow cut off → On value (1805)
Prerequisite	One of the following options is selected in the Assign variable parameter (→ 82): - Mass flow - Volume flow - Correct.vol.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 → 82.
User entry	Positive floating-point number
Factory setting	Depends on country and nominal diameter→ 243
Additional information	<i>Dependency</i> i The unit depends on the process variable selected in the Assign variable parameter (→ 82).

Off value

Navigation	Expert → Sensor → Process param. → Low flow cut off → Off value (1804)
Prerequisite	One of the following options is selected in the Assign variable parameter (→ 82): - Mass flow - Volume flow - Correct.vol.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 →  82.
User entry	0 to 100.0 %
Factory setting	50 %
Additional information	<i>Example</i>



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

Pres. shock sup.

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

Prerequisite One of the following options is selected in the **Assign variable** parameter (→  82):

- Mass flow
- Volume flow
- Correct.vol.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

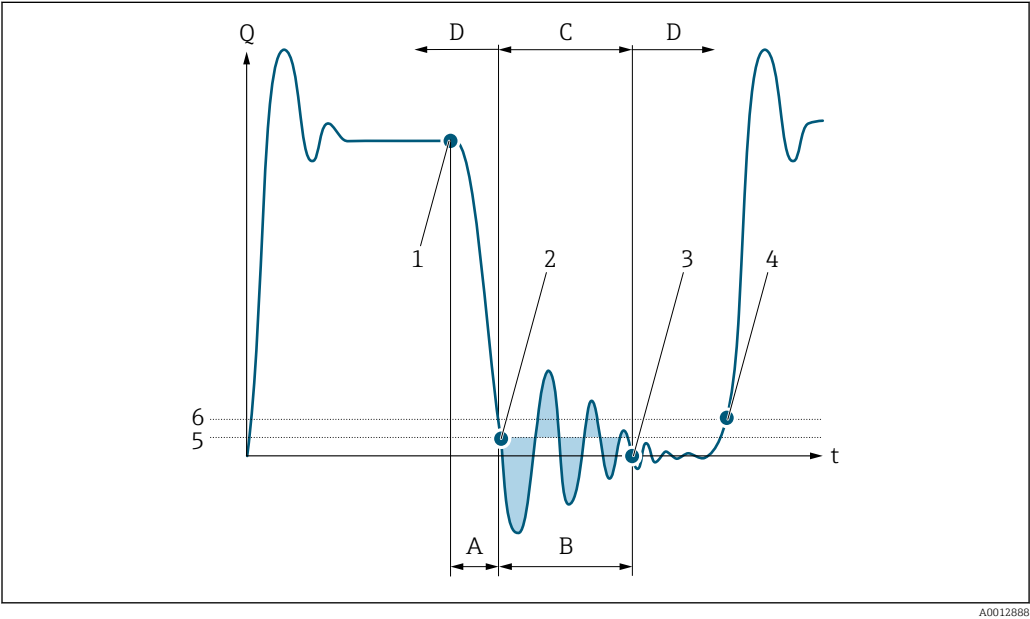
- Prerequisite:
 - Flow rate < on-value of low flow cut off
 - or
 - Changing the flow direction
- Output values
 - Flow displayed: 0
 - Totalizer: the totalizers are pegged at the last correct value

Pressure shock suppression is disabled

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

Example

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



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

"Partial pipe det" submenu

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

► Partial pipe det

Assign variable (1860)

→  85

Low value (1861)

→  85

High value (1858)

→  86

Response time (1859)	→ 86
Max. damping (6040)	→ 86

Assign variable

Navigation	  Expert → Sensor → Process param. → Partial pipe det → Assign variable (1860)
Description	Use this function to select a process variable to detect empty or partially filled measuring tubes. For gas measurement: Deactivate monitoring due to low gas density.
Selection	■ Off ■ Density ■ Ref.density
Factory setting	Off

Low value

Navigation	  Expert → Sensor → Process param. → Partial pipe det → Low value (1861)
Prerequisite	One of the following options is selected in the Assign variable parameter (→ 85): ■ Density ■ Ref.density
Description	Use this function to enter a lower limit value to enable detection of empty or partially filled measuring tubes. If the measured density falls below this value, monitoring is enabled.
User entry	Signed floating-point number
Factory setting	200
Additional information	<i>User entry</i> The lower limit value must be less than the upper limit value defined in the High value parameter (→ 86).  The unit depends on the process variable selected in the Assign variable parameter (→ 85). <i>Limit value</i>  If the displayed value is outside the limit value, the measuring device displays the diagnostic message △S862 Partly filled.

High value		
Navigation	Expert → Sensor → Process param. → Partial pipe det → High value (1858)	
Prerequisite	One of the following options is selected in the Assign variable parameter (→ 85): ■ Density ■ Ref.density	
Description	Use this function to enter an upper limit value to enable detection of empty or partially filled measuring tubes. If the measured density exceeds this value, detection is enabled.	
User entry	Signed floating-point number	
Factory setting	6 000	
Additional information	<i>User entry</i> The upper limit value must be greater than the lower limit value defined in the Low value parameter (→ 85). The unit depends on the process variable selected in the Assign variable parameter (→ 85). <i>Limit value</i> If the displayed value is outside the limit value, the measuring device displays the diagnostic message △S862 Partly filled.	
Response time		
Navigation	Expert → Sensor → Process param. → Partial pipe det → Response time (1859)	
Prerequisite	One of the following options is selected in the Assign variable parameter (→ 85): ■ Density ■ Ref.density	
Description	Use this function to enter the minimum length of time (debouncing time) the signal must be present for the diagnostic message △S862 Partly filled to be triggered if the measuring pipe is empty or partially full.	
User entry	0 to 100 s	
Factory setting	1 s	
Max. damping		
Navigation	Expert → Sensor → Process param. → Partial pipe det → Max. damping (6040)	
Description	Use this function to enter a damping value to enable detection of empty or partially filled measuring tubes.	

User entry	Positive floating-point number
Factory setting	0
Additional information	<i>Description</i> If oscillation damping exceeds the specified value, the measuring device presumes that the pipe is partially filled and the flow signal is set to 0. The measuring device displays the diagnostic message △S862 Partly filled. In the case of non-homogeneous media or air pockets, the damping of the measuring tubes increases. <i>User entry</i> ■ Damping is disabled if 0 is entered (factory setting). ■ Damping is enabled if the value entered is greater than 0. ■ The value entered depends on application-specific influence variables, such as the medium, nominal diameter, sensor etc. <i>Example</i> ■ If the pipe is filled normally the value of the oscillation damping is 500. ■ If the pipe is partially filled the value of the oscillation damping is > 5000. ■ A practical damping value would then be 2000: enter 2000 as the value.

3.2.4 "Measurement mode" submenu

Navigation  Expert → Sensor → Measurement mode

► Measurement mode

Select medium (6062)

Select gas type (6074)

Sound velocity (6147)

Temp. coeff. SV (6181)

→  88

→  88

→  89

→  89

Multi-freq.activ

Navigation	 Expert → Sensor → Measurement mode → Multi-freq.activ (6242)
Description	Switching the dual mode of the sensor on and off.
Selection	■ No ■ Yes
Factory setting	No

Select medium



Navigation	Expert → Sensor → Measurement mode → Select medium (6062)
Description	Use this function to select the type of medium.
Selection	Liquid
Factory setting	Liquid

Select gas type



Navigation	Expert → Sensor → Measurement mode → Select gas type (6074)
Prerequisite	The Gas option is selected in the Select medium parameter (→ 88).
Description	Use this function to select the type of gas for the measuring application.
Selection	■ Air ■ Ammonia NH₃ ■ Argon Ar ■ Sulf. hex.fl.SF₆ ■ Oxygen O₂ ■ Ozone O₃ ■ Nitrog. ox. NO_x ■ Nitrogen N₂ ■ Nitrous ox. N₂O ■ Methane CH₄ ■ Hydrogen H₂ ■ Helium He ■ Hydrog.chlor.HCl ■ Hydrog.sulf. H₂S ■ Ethylene C₂H₄ ■ Carbon diox. CO₂ ■ Carbon monox. CO ■ Chlorine Cl₂ ■ Butane C₄H₁₀ ■ Propane C₃H₈ ■ Propylene C₃H₆ ■ Ethane C₂H₆ ■ Others
Factory setting	Methane CH ₄
Additional information	<i>Description</i> The gas type needs to be selected so that it is possible to comply with accuracy specifications in gas applications.

Sound velocity

Navigation	 Expert → Sensor → Measurement mode → Sound velocity (6147)
Prerequisite	In the Select gas type parameter (→  88), the Others option is selected.
Description	Use this function to enter the sound velocity of the gas at 0 °C (+32 °F).
User entry	1 to 99 999.9999 m/s
Factory setting	415.0 m/s

Temp. coeff. SV

Navigation	 Expert → Sensor → Measurement mode → Temp. coeff. SV (6181)
Prerequisite	The Others option is selected in the Select gas type parameter (→  88).
Description	Use this function to enter a temperature coefficient for the sound velocity of the gas.
User entry	Positive floating-point number
Factory setting	0 (m/s)/K

3.2.5 "External comp." submenu

Navigation  Expert → Sensor → External comp.

► External comp.		
Pressure compen. (6130)	→  90	
Pressure value (6059)	→  90	
External press. (6209)	→  91	
FailSafeTypExtPr (2077)	→  91	
FailSafeValExtPr (2078)	→  92	
Temp.corr.source (6184)	→  92	
External temp. (6080)	→  93	

FailSafeTypeExtT (2075)	→ 93
FailSafeValExtT (2076)	→ 93

Pressure compen.

Navigation	Expert → Sensor → External comp. → Pressure compen. (6130)
Description	Use this function to select the type of pressure compensation.
Selection	■ Off ■ Fixed value ■ External value ■ Current input 1 * ■ Current input 2 *
Factory setting	Off
Additional information	<i>Selection</i> ■ Fixed value A fixed pressure value is used for compensation: Pressure value parameter (→ 90) ■ External value The pressure value read in via is used for compensation. The pressure value of cyclic PROFINET communication is accepted. In addition, the "External pressure " compensation value must be incorporated into the analog output module. ■ Current input 1 The pressure value read in via the current input is used for compensation. For more information, see the "Cyclic data transmission" section of the Operating Instructions

Pressure value

Navigation	Expert → Sensor → External comp. → Pressure value (6059)
Prerequisite	The Fixed value option is selected in the Pressure compen. parameter (→ 90).
Description	Use this function to enter a value for the process pressure that is used for pressure correction.
User entry	Positive floating-point number
Factory setting	0 bar

* Visibility depends on order options or device settings

Additional information*User entry*The unit is taken from the **Pressure unit** parameter (→ 70)

External press.

Navigation

Expert → Sensor → External comp. → External press. (6209)

PrerequisiteThe **External value** option is selected in the **Pressure compen.** parameter (→ 90).**Description**

Use this function to enter an external pressure value.

User interface

Positive floating-point number

Factory setting

0 bar

Additional information*User entry*The unit is taken from the **Pressure unit** parameter (→ 70)

FailSafeTypExtPr

Navigation

Expert → Sensor → External comp. → FailSafeTypExtPr (2077)

Description

Use this function to select the failsafe mode for the external density value.

Selection

- Fail-safe value
- Fallback value
- Off

Factory setting

Off

Additional information*Description*

If the status of the input or simulation value is BAD, the failsafe mode defined here is used.

Selection

- Fail-safe value
A substitute value is used. The substitute value is defined in the **FailSafeValExtPr** parameter (→ 92).
- Fallback value
The last valid value is used.
- **Off** option: The invalid value continues to be used.

FailSafeValExtPr 	
Navigation	  Expert → Sensor → External comp. → FailSafeValExtPr (2078)
Prerequisite	The Fail-safe value option is selected in the FailSafeTypExtPr parameter (→  91).
Description	Use this function to enter a fixed pressure value that is used for the external pressure in the event of a device alarm.
User entry	Signed floating-point number
Factory setting	0 bar
Additional information	<i>Description</i> In the event of a device alarm, the pressure value is displayed as an output value in the Pressure value parameter (→  52).
Temp.corr.source 	
Navigation	  Expert → Sensor → External comp. → Temp.corr.source (6184)
Description	Use this function to select the temperature mode.
Selection	■ Internal value ■ External value ■ Current input 1 ■ Current input 2 ■ Current input 3
Factory setting	Internal value
Additional information	<i>Description</i> Use this function to select the type of temperature compensation. <i>Selection</i> All the options available for selection are used for measured value compensation. ■ Internal value The temperature value measured internally (temperature sensor of the measuring sensor) is used for compensation. ■ External value The temperature value of cyclic PROFINET communication is accepted. In addition, the "External temperature" compensation value must be incorporated into the analog output module. ■ Current input 1 The temperature value read in via the current input is used for compensation.  For more information, see the "Cyclic data transmission" section of the Operating Instructions

External temp.

Navigation	 Expert → Sensor → External comp. → External temp. (6080)
Prerequisite	In the Temperature mode parameter (→  92), the External value option is selected.
Description	Use this function to enter the external temperature.
User interface	-273.15 to 99 999 °C
Factory setting	Country-specific: ■ 0 °C ■ +32 °F
Additional information	<i>Description</i>  The unit is taken from the Temperature unit parameter (→  69)

FailSafeTypExtT

Navigation	 Expert → Sensor → External comp. → FailSafeTypExtT (2075)
Description	Use this function to select the failsafe mode for the external temperature value.
Selection	■ Fail-safe value ■ Fallback value ■ Off
Factory setting	Off
Additional information	<i>Description</i> If the status of the input or simulation value is BAD, the failsafe mode defined here is used. <i>Selection</i> ■ Fail-safe value A substitute value is used. The substitute value is defined in the FailSafeValExtT parameter (→  93). ■ Fallback value The last valid value is used. ■ Off The invalid value continues to be used.

FailSafeValExtT



Navigation	 Expert → Sensor → External comp. → FailSafeValExtT (2076)
Prerequisite	The Fail-safe value option is selected in the FailSafeTypExtT parameter (→  93).

Description	Use this function to enter a fixed temperature value that is used for the external pressure in the event of a device alarm.
User entry	Signed floating-point number
Factory setting	0 °C
Additional information	<i>Description</i> In the event of a device alarm, the temperature value is displayed as an output value in the Temperature parameter (→  51).

Temperature mode

Navigation	  Expert → Sensor → External comp. → Temperature mode (6341)
Description	...
Selection	■ Internal value ■ External value
Factory setting	Internal value

3.2.6 "Calculated value" submenu

Navigation   Expert → Sensor → Calculated value

► Calculated value

► Corr. vol.flow.

→  94

"Corr. vol.flow." submenu

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

► Corr. vol.flow.

Corr. vol.flow. (1812)

→  95

Ext. ref.density (6198)

→  95

Fix ref.density (1814)

→  96

Ref. temperature (1816)

→  97

Linear exp coeff (1817)	→ 98
Square exp coeff (1818)	→ 98

Corr. vol.flow.

Navigation	Expert → Sensor → Calculated value → Corr. vol.flow. → Corr. vol.flow. (1812)
Description	Use this function to select the reference density for calculating the corrected volume flow.
Selection	■ Fix ref.density ■ Calc ref density ■ Ext. ref.density ■ Current input 1 * ■ Current input 2 *
Factory setting	Calc ref density
Additional information	<i>Selection</i> The Ref. dens API 53 option is suitable only for applications involving LPG ⁵⁾, where the flow rate is measured on the basis of the corrected volume flow. Selecting this option means that the reference density is used, taking into account the values in table 53 E of API MPMS section 11.2. Temperature measurement (measured internally or read into the device from an external source → 89 → 89) and density measurement take place during operation while the medium is flowing. The mass flow is divided by the reference density to give the corrected volume flow and is issued as an output signal. Ext. ref.density The reference density value of cyclic PROFINET communication is accepted. In addition, the "External reference density" compensation value must be incorporated into the Analog Output module. For more information, see the "Cyclic data transmission" section of the Operating Instructions

Ext. ref.density

Navigation	Expert → Sensor → Calculated value → Corr. vol.flow. → Ext. ref.density (6198)
Prerequisite	In the Corr. vol.flow. parameter (→ 95), the Ext. ref.density option is selected.
Description	Displays the reference density which is read in externally, e.g. via the current input.
User interface	Floating point number with sign

* Visibility depends on order options or device settings

5) liquefied petroleum gas

Additional information	Dependency  The unit is taken from the Ref. dens. unit parameter (→  69)
Fix ref.density	
Navigation	  Expert → Sensor → Calculated value → Corr. vol.flow. → Fix ref.density (1814)
Prerequisite	The Fix ref.density option is selected in the Corr. vol.flow. parameter (→  95) parameter.
Description	Use this function to enter a fixed value for the reference density.
User entry	Positive floating-point number
Factory setting	1 kg/Nl
Additional information	Dependency  The unit is taken from the Ref. dens. unit parameter (→  69)

FailSaTypRefDens	
Navigation	  Expert → Sensor → Calculated value → Corr. vol.flow. → FailSaTypRefDens (2079)
Description	Use this function to select the failsafe mode for the external reference density value.
Selection	■ Fail-safe value ■ Fallback value ■ Off
Factory setting	Off
Additional information	Description If the status of the input or simulation value is BAD, the failsafe mode defined here is used. Selection ■ Fail-safe value - A substitute value is used. The substitute value is defined in the FailSaValRefDens parameter (→  97). ■ Fallback value - The last valid value is used. ■ Off - The invalid value continues to be used.

FailSaValRefDens

Navigation	Expert → Sensor → Calculated value → Corr. vol.flow. → FailSaValRefDens (2080)
Prerequisite	The Fail-safe value option is selected in the FailSaTypRefDens parameter (→ 96).
Description	Use this function to enter a fixed reference density value that is used for the external reference density in the event of a device alarm.
User entry	Signed floating-point number
Factory setting	0 kg/Nl
Additional information	<i>Description</i> In the event of a device alarm, the reference density value is displayed as an output value in the Ref.density parameter (→ 51).

Ref. temperature

Navigation	Expert → Sensor → Calculated value → Corr. vol.flow. → Ref. temperature (1816)
Prerequisite	The Calc ref density option is selected in the Corr. vol.flow. parameter (→ 95).
Description	Use this function to enter a reference temperature for calculating the reference density.
User entry	−273.15 to 99 999 °C
Factory setting	Country-specific: ■ +20 °C ■ +68 °F
Additional information	<i>Dependency</i> The unit is taken from the Temperature unit parameter (→ 69)

Reference density calculation

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

A0023403

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

Linear exp coeff		
Navigation	 Expert → Sensor → Calculated value → Corr. vol.flow. → Linear exp coeff (1817)	
Prerequisite	The Calc ref density option is selected in the Corr. vol.flow. parameter (→  95)	
Description	Use this function to enter a linear, fluid-specific expansion coefficient for calculating the reference density.	
User entry	Signed floating-point number	
Factory setting	0.0 1/K	

Square exp coeff		
Navigation	 Expert → Sensor → Calculated value → Corr. vol.flow. → Square exp coeff (1818)	
Prerequisite	The Calc ref density option is selected in the Corr. vol.flow. parameter (→  95)	
Description	For fluid with a non-linear expansion pattern: use this function to enter a quadratic, fluid-specific expansion coefficient for calculating the reference density.	
User entry	Signed floating-point number	
Factory setting	0.0 1/K ²	

3.2.7 "Sensor adjustment" submenu

Navigation  Expert → Sensor → Sensor adjustm.

► Sensor adjustm.	
Install. direct. (1809)	→  99
Inst. angle roll (6282)	→  99
Inst.angle pitch (6236)	→  99
► Zero point adj.	→  100
► Variable adjust	→  101

Install. direct.

Navigation	 Expert → Sensor → Sensor adjustm. → Install. direct. (1809)
Description	Use this function to change the sign of the medium flow direction.
Selection	■ In arrow direct. ■ Against arrow
Factory setting	In arrow direct.
Additional information	<i>Description</i>  Before changing the sign: ascertain the actual direction of fluid flow with reference to the direction indicated by the arrow on the sensor nameplate.

Inst. angle roll

Navigation	 Expert → Sensor → Sensor adjustm. → Inst. angle roll (6282)
Prerequisite	Available only with Promass Q.
Description	Use this function to enter the roll installation angle in degrees.
User entry	-180 to 180 °
Factory setting	0 °
Additional information	FIGURE: ROLL ANGLE Roll angle ■ The roll angle is the angle β from the vertical V to align the central axis Z of the transmitter. ■ The roll angle can be between -180 to +180 °.

Inst.angle pitch

Navigation	 Expert → Sensor → Sensor adjustm. → Inst.angle pitch (6236)
Prerequisite	Available only with Promass Q.
Description	Use this function to enter the installation angle pitch in degrees.
User entry	-180 to 180 °
Factory setting	0 °
Additional information	FIGURE: PITCH ANGLE

Pitch angle

- The pitch angle is the angle α from the horizontal **H** to align the central axis **Z** of the measuring device.
- The pitch angle can be between -90 to +90 °.

"Zero point adj." submenu

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

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

► Zero point adj.

Zero point adj. (6196)

→  100

Progress (2808)

→  101

Zero point adj.

Navigation  Expert → Sensor → Sensor adjustm. → Zero point adj. → Zero point adj. (6196)

Description Use this function to select the start of the zero point adjustment.

 Observe conditions →  100.

- Selection
- Cancel
 - Busy
 - Zero adjust fail
 - Start

Factory setting Cancel

Additional information	<i>Description</i> ■ Cancel If zero point adjustment has failed, select this option to cancel zero point adjustment. ■ Busy Is displayed during zero point adjustment. ■ Zero adjust fail Is displayed if zero point adjustment has failed. ■ Start Select this option to start zero point adjustment.
-------------------------------	--

Progress

Navigation	 Expert → Sensor → Sensor adjustm. → Zero point adj. → Progress (2808)
Description	The progress of the process is indicated.
User interface	0 to 100 %

"Variable adjust" submenu

Navigation  Expert → Sensor → Sensor adjustm. → Variable adjust

► Variable adjust		
Mass flow offset (1831)	→ 	102
Mass flow factor (1832)	→ 	102
Vol. flow offset (1841)	→ 	102
Vol. flow factor (1846)	→ 	103
Density offset (1848)	→ 	103
Density factor (1849)	→ 	103
Corr. vol offset (1866)	→ 	104
Corr. vol factor (1867)	→ 	104
Ref.dens. offset (1868)	→ 	104
Ref.dens. factor (1869)	→ 	105

Temp. offset (1870)	→ 105
Temp. factor (1871)	→ 105

Mass flow offset

Navigation	  Expert → Sensor → Sensor adjustm. → Variable adjust → Mass flow offset (1831)
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 (1832)
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

Vol. flow offset

Navigation	  Expert → Sensor → Sensor adjustm. → Variable adjust → Vol. flow offset (1841)
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

Vol. flow factor**Navigation**

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

Description

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

User entry

Positive floating-point number

Factory setting

1

Additional information*Description*

Corrected value = (factor × value) + offset

Density offset**Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Density offset (1848)

Description

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

User entry

Signed floating-point number

Factory setting0 kg/m³**Additional information***Description*

Corrected value = (factor × value) + offset

Density factor**Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Density factor (1849)

Description

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

User entry

Positive floating-point number

Factory setting

1

Additional information *Description*

 Corrected value = (factor × value) + offset

Corr. vol offset**Navigation**

 Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol offset (1866)

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 Nm³/s.

User entry

Signed floating-point number

Factory setting

0 Nm³/s

Additional information *Description*

 Corrected value = (factor × value) + offset

Corr. vol factor**Navigation**

 Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol factor (1867)

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 *Description*

 Corrected value = (factor × value) + offset

Ref.dens. offset**Navigation**

 Expert → Sensor → Sensor adjustm. → Variable adjust → Ref.dens. offset (1868)

Description

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

User entry

Signed floating-point number

Factory setting

0 kg/Nm³

Additional information*Description*

Corrected value = (factor × value) + offset

Ref.dens. factor**Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Ref.dens. factor (1869)

Description

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

User entry

Positive floating-point number

Factory setting

1

Additional information*Description*

Corrected value = (factor × value) + offset

Temp. offset**Navigation**

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

Description

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

User entry

Signed floating-point number

Factory setting

0 K

Additional information*Description*

Corrected value = (factor × value) + offset

Temp. factor**Navigation**

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

Description

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

User entry

Positive floating-point number

Factory setting

1

Additional information	Description
	 Corrected value = (factor × value) + offset

3.2.8 "Calibration" submenu

Navigation   Expert → Sensor → Calibration

► Calibration

Cal. factor (6025)

→  106

Zero point (6195)

→  106

Nominal diameter (2807)

→  107

C0 to 5 (6022)

→  107

Cal. factor

Navigation	  Expert → Sensor → Calibration → Cal. factor (6025)
Description	Displays the current calibration factor for the sensor.
User interface	Signed floating-point number
Factory setting	Depends on nominal diameter and calibration.

Zero point

Navigation	  Expert → Sensor → Calibration → Zero point (6195)
Description	Use this function to enter the zero point correction value for the sensor.
User entry	Signed floating-point number
Factory setting	Depends on nominal diameter and calibration.

Nominal diameter	
Navigation	 Expert → Sensor → Calibration → Nominal diameter (2807)
Description	Displays the nominal diameter of the sensor.
User interface	DNxx / x"
Factory setting	Depends on the size of the sensor
Additional information	Description
	 The value is also specified on the sensor nameplate.

C0 to 5	
---------	--

Navigation	 Expert → Sensor → Calibration → C0 to 5 (6022)
Description	Displays the current density coefficients C0 to 5 of the sensor.
User interface	Signed floating-point number
Factory setting	0

3.3 "I/O configuration" submenu

Navigation  Expert → I/O config.

	
I/O 1 to n terminals (3902-1 to n)	→  108
I/O 1 to n info (3906-1 to n)	→  108
I/O 1 to n type (3901-1 to n)	→  108
Apply I/O config (3907)	→  109
Alteration code (2762)	→  109

I/O 1 to n terminals

Navigation	 Expert → I/O config. → I/O 1 to n terminals (3902–1 to n)
Description	Displays the terminal numbers used by the I/O module.
User interface	■ Not used ■ 26-27 (I/O 1) ■ 24-25 (I/O 2) ■ 22-23 (I/O 3)

I/O 1 to n info

Navigation	 Expert → I/O config. → I/O 1 to n info (3906–1 to n)
Description	Displays information about the plugged in I/O module.
User interface	■ Not plugged ■ Invalid ■ Not configurable ■ Configurable ■ PROFINET
Additional information	<i>"Not plugged" option</i> The I/O module is not plugged in. <i>"Invalid" option</i> The I/O module is not plugged correctly. <i>"Not configurable" option</i> The I/O module is not configurable. <i>"Configurable" option</i> The I/O module is configurable. <i>"Fieldbus" option</i> The I/O module is configured for the fieldbus.

I/O 1 to n type



Navigation	 Expert → I/O config. → I/O 1 to n type (3901–1 to n)
Prerequisite	For the following order code: "Output; input 2", option D "Configurable I/O initial setting off"
Description	Use this function to select the I/O module type for the configuration of the I/O module.

Selection	■ Off
	■ Curr.output *
	■ Current input *
	■ Status input *
	■ PFS output *

Factory setting Off

Apply I/O config

Navigation   Expert → I/O config. → Apply I/O config (3907)

Description Use this function to activate the newly configured I/O module type.

Selection

- No
- Yes

Factory setting No

Alteration code

Navigation   Expert → I/O config. → Alteration code (2762)

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

User entry Positive integer

Factory setting 0

Additional information *Description*
The I/O configuration is changed in the **I/O type** parameter (→  108).

* Visibility depends on order options or device settings

3.4 "Input" submenu

Navigation  Expert → Input

► Input

► Current input 1 to n

→  110

► Status input 1 to n

→  113

3.4.1 "Current input 1 to n" submenu

Navigation  Expert → Input → Current input 1 to n

► Current input 1 to n

Terminal no. (1611-1 to n)

→  110

Signal mode (1610-1 to n)

→  111

Current span (1605-1 to n)

→  111

0/4 mA value (1606-1 to n)

→  111

20 mA value (1607-1 to n)

→  112

Failure mode (1601-1 to n)

→  112

Failure value (1602-1 to n)

→  113

Terminal no.

Navigation	 Expert → Input → Current input 1 to n → Terminal no. (1611-1 to n)
Description	Displays the terminal numbers used by the current input module.
User interface	■ Not used ■ 24-25 (I/O 2) ■ 22-23 (I/O 3)
Additional information	"Not used" option The current input module does not use any terminal numbers.

Signal mode



Navigation	 Expert → Input → Current input 1 to n → Signal mode (1610–1 to n)
Prerequisite	The measuring device is not approved for use in the hazardous area with type of protection Ex-i.
Description	Use this function to select the signal mode for the current input.
Selection	■ Passive ■ Active
Factory setting	Active

Current span



Navigation	 Expert → Input → Current input 1 to n → Current span (1605–1 to n)
Description	Use this function to select the current range for the process value output and the upper and lower level for signal on alarm.
Selection	■ 4...20 mA ■ 4...20 mA NAMUR ■ 4...20 mA US ■ 0...20 mA
Factory setting	Country-specific: ■ 4...20 mA NAMUR ■ 4...20 mA US
Additional information	<i>Examples</i>  Sample values for the current range: Current span parameter (→  118)

0/4 mA value



Navigation	 Expert → Input → Current input 1 to n → 0/4 mA value (1606–1 to n)
Description	Use this function to enter a value for the 4 mA current.
User entry	Signed floating-point number
Factory setting	0

Additional information *Current input behavior*

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

- Current span (→  111)
- Failure mode (→  112)

Configuration examples

 Pay attention to the configuration examples for **4 mA value** parameter (→  119).

20 mA value**Navigation**

  Expert → Input → Current input 1 to n → 20 mA value (1607-1 to n)

Description

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

User entry

Signed floating-point number

Factory setting

Depends on country and nominal diameter

Additional information

Configuration examples

 Pay attention to the configuration examples for **4 mA value** parameter (→  119).

Failure mode**Navigation**

  Expert → Input → Current input 1 to n → Failure mode (1601-1 to n)

Description

Use this function to select the input behavior when measuring a current outside the configured **Current span** parameter (→  111).

Selection

- Alarm
- Last valid value
- Defined value

Factory setting

Alarm

Additional information

Options

- Alarm
An error message is set.
- Last valid value
The last valid measured value is used.
- Defined value
A user-defined measured value is used (**Failure value** parameter (→  113)).

Failure value	
Navigation	Expert → Input → Current input 1 to n → Failure value (1602-1 to n)
Prerequisite	In the Failure mode parameter (→ 112), the Defined value option is selected.
Description	Use this function to enter the value that the device uses if it does not receive an input signal from the external device, or if the input signal is invalid.
User entry	Signed floating-point number
Factory setting	0

3.4.2 "Status input 1 to n" submenu

Navigation Expert → Input → Status input 1 to n

► Status input 1 to n

Terminal no. (1358-1 to n)

→ 113

Assign stat.inp. (1352-1 to n)

→ 114

Val.stat.inp. (1353-1 to n)

→ 114

Active level (1351-1 to n)

→ 114

Response time (1354-1 to n)

→ 115

Terminal no.	
Navigation	Expert → Input → Status input 1 to n → Terminal no. (1358-1 to n)
Description	Displays the terminal numbers used by the status input module.
User interface	■ Not used ■ 24-25 (I/O 2) ■ 22-23 (I/O 3)
Additional information	<i>"Not used" option</i> The status input module does not use any terminal numbers.

Assign stat.inp.		
Navigation	 Expert → Input → Status input 1 to n → Assign stat.inp. (1352–1 to n)	
Description	Use this function to select the function for the status input.	
Selection	■ Off ■ Reset totaliz. 1 ■ Reset totaliz. 2 ■ Reset totaliz. 3 ■ Reset all tot. ■ Flow override	
Factory setting	Off	
Additional information	<i>Selection</i> ■ Off The status input is switched off. ■ Reset totaliz. 1...3 The individual totalizers are reset. ■ Reset all tot. All totalizers are reset. ■ Flow override The Flow override (→  81) is activated.  Note on the Flow override (→  81): ■ The Flow override (→  81) is enabled as long as the level is at the status input (continuous signal). ■ All other assignments react to a change in level (pulse) at the status input.	

Val.stat.inp.	
Navigation	  Expert → Input → Status input 1 to n → Val.stat.inp. (1353–1 to n)
Description	Displays the current input signal level.
User interface	■ High ■ Low
Active level	
Navigation	  Expert → Input → Status input 1 to n → Active level (1351–1 to n)
Description	Use this function to determine the input signal level at which the assigned function is activated.
Selection	■ High ■ Low

Factory setting High

Response time

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

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

User entry 5 to 200 ms

Factory setting 50 ms

3.5 "Output" submenu

Navigation  Expert → Output

► Output

► Curr.output 1 to n

→  115

► PFS output 1 to n

→  131

► Relay output 1 to n

→  157

3.5.1 "Current output 1 to n" submenu

Navigation  Expert → Output → Curr.output 1 to n

► Curr.output 1 to n

Terminal no. (0379-1 to n)

→  116

Signal mode (0377-1 to n)

→  116

Assign curr. 1 to n (0359-1 to n)

→  117

Current span (0353-1 to n)

→  118

Fixed current (0365-1 to n)

→  119

0/4 mA value (0367-1 to n)

→  119

20 mA value (0372-1 to n)

→  121

Measuring mode (0351-1 to n)	→  122
Damping out. 1 to n (0363-1 to n)	→  127
Response time (0378-1 to n)	→  128
Failure mode (0364-1 to n)	→  129
Failure current (0352-1 to n)	→  130
Output curr. 1 to n (0361-1 to n)	→  131
Measur. curr. 1 to n (0366-1 to n)	→  131

Terminal no.

Navigation	  Expert → Output → Curr.output 1 to n → Terminal no. (0379-1 to n)
Description	Displays the terminal numbers used by the current output module.
User interface	■ Not used ■ 24-25 (I/O 2) ■ 22-23 (I/O 3)
Additional information	<i>"Not used" option</i> The current output module does not use any terminal numbers.

Signal mode



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

**Assign curr. 1 to n****Navigation**

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

Description

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



Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry: Value 1 display** parameter (→  18)

Selection

- Off
- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Target vol. flow
- Carrier vol. fl.
- Targ.corr.vol.fl
- Carr.corr.vol.fl
- Density
- Ref.density
- Ref.dens.altern.
- GSV flow
- GSVa
- NSV flow
- NSVa
- S&W volume flow
- Water cut
- Oil density
- Water density
- Oil mass flow
- Water mass flow
- Oil volume flow
- Water vol. flow
- Oil corr.vol.fl.
- Water corr.v.fl.
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0

* Visibility depends on order options or device settings

- Exc. current 1 *
- HBSI *
- Pressure

Factory setting

Mass flow

Current span**Navigation**

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

Description

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

Selection

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

Factory setting

Country-specific:

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

Additional information*Description*

- In the event of a device alarm, the current output adopts the value specified in the **Failure mode** parameter (→ 129).
- If the measured value is outside the measuring range, the diagnostic message **△S441 Curr.output 1 to n** is displayed.
- The measuring range is specified via the **0/4 mA value** parameter (→ 119) and **20 mA value** parameter (→ 121).

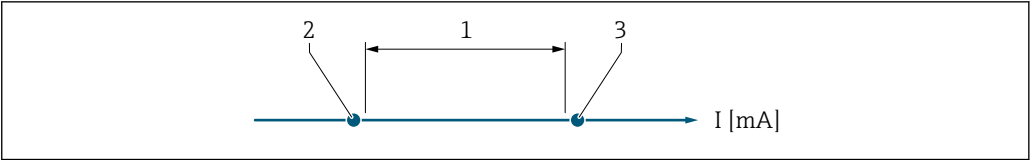
"Fixed current" option

The current value is set via the **Fixed current** parameter (→ 119).

Example

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

* Visibility depends on order options or device settings



A0034351

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

Selection

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

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

Fixed current

Navigation	 Expert → Output → Curr.output 1 to n → Fixed current (0365-1 to n)
Prerequisite	The Fixed current option is selected in the Current span parameter (→  118).
Description	Use this function to enter a constant current value for the current output.
User entry	0 to 22.5 mA
Factory setting	22.5 mA

0/4 mA value

Navigation	 Expert → Output → Curr.output 1 to n → 0/4 mA value (0367-1 to n)
Prerequisite	One of the following options is selected in the Current span parameter (→  118): ■ 4...20 mA NAMUR ■ 4...20 mA US ■ 4...20 mA ■ 0...20 mA
Description	Use this function to enter a value for the 0/4 mA current.
User entry	Signed floating-point number

Factory setting

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

Additional information

Description

Positive and negative values are permitted depending on the process variable assigned in the **Assign curr.** parameter (→ ⓘ 117). In addition, the value can be greater than or smaller than the value assigned for the 20 mA current in the **20 mA value** parameter (→ ⓘ 121).

Dependency

 The unit depends on the process variable selected in the **Assign curr.** parameter (→ ⓘ 117).

Current output behavior

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

- Current span (→ ⓘ 118)
- Failure mode (→ ⓘ 129)

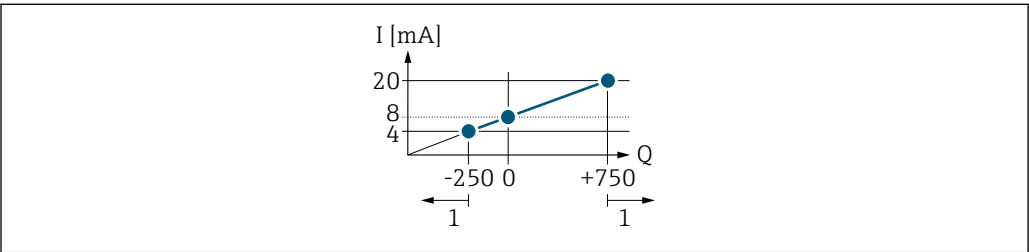
Configuration examples

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

Configuration example A

Measuring mode with **Forward flow** option

- **0/4 mA value** parameter (→ ⓘ 119) = not equal to zero flow (e.g. -250 m³/h)
- **20 mA value** parameter (→ ⓘ 121) = not equal to zero flow (e.g. +750 m³/h)
- Calculated current value = 8 mA at zero flow



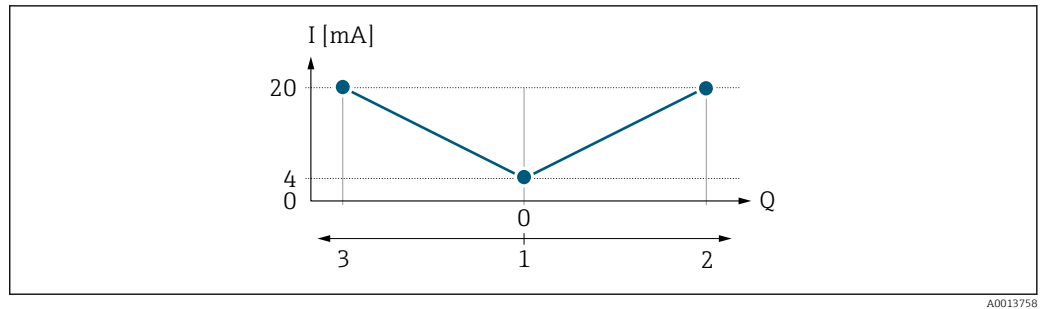
A0013757

Q Flow
I Current
1 Measuring range is exceeded or undershot

The operational range of the measuring device is defined by the values entered for the **0/4 mA value** parameter (→ ⓘ 119) and **20 mA value** parameter (→ ⓘ 121). If the effective flow exceeds or falls below this operational range, the diagnostic message **△S441 Curr.output 1 to n** is displayed.

Configuration example B

Measuring mode with **Forward/Reverse** option



A0013758

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

The current output signal is independent of the direction of flow (absolute amount of the measured variable). The values for the **0/4 mA value** parameter (→ [📄 119](#)) and **20 mA value** parameter (→ [📄 121](#)) must have the same sign. The value for the **20 mA value** parameter (→ [📄 121](#)) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (→ [📄 121](#)) (e.g. forward flow).

Configuration example C

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

If flow is characterized by severe fluctuations (e.g. when using reciprocating pumps), flow components outside the measuring range are buffered, balanced and output after a maximum delay of 60 s → [📄 122](#).

20 mA value



Navigation	📄 📄 Expert → Output → Curr.output 1 to n → 20 mA value (0372-1 to n)
Prerequisite	One of the following options is selected in the Current span parameter (→ 📄 118): ■ 4...20 mA NAMUR ■ 4...20 mA US ■ 4...20 mA ■ 0...20 mA
Description	Use this function to enter a value for the 20 mA current.
User entry	Signed floating-point number
Factory setting	Depends on country and nominal diameter → 📄 242
Additional information	<i>Description</i> Positive and negative values are permitted depending on the process variable assigned in the Assign curr. parameter (→ 📄 117). In addition, the value can be greater than or

smaller than the value assigned for the 0/4 mA current in the **0/4 mA value** parameter (→  119).

Dependency

 The unit depends on the process variable selected in the **Assign curr.** parameter (→  117).

Example

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

If the **Forward/Reverse** option is selected in the **Measuring mode** parameter (→  122), different signs cannot be entered for the values of the **0/4 mA value** parameter (→  119) and **20 mA value** parameter (→  121). The diagnostic message **△S441 Curr.output 1 to n** is displayed.

Configuration examples

 Observe the configuration examples for the **0/4 mA value** parameter (→  119).

Measuring mode

Navigation

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

Prerequisite

One of the following options is selected in the **Assign curr.** parameter (→  117):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry

* Visibility depends on order options or device settings

- Exc. current 0
- Exc. current 1 *
- HBSI *

 Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry: Value 1 display** parameter (→  18)

One of the following options is selected in the **Current span** parameter (→  118):

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

Description

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

Selection

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

Factory setting

Forward flow

Additional information

Description

 The process variable that is assigned to the current output via the **Assign curr.** parameter (→  117) is displayed below the parameter.

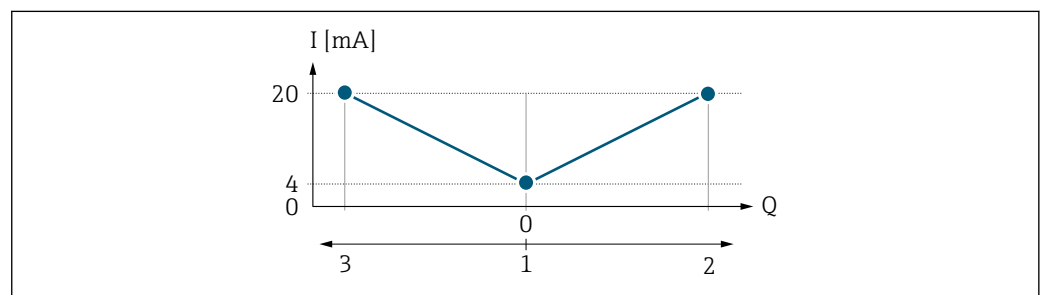
"Forward flow" option

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

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

- Both values are defined such that they are not equal to zero flow e.g.:
 - 0/4 mA current value = $-5 \text{ m}^3/\text{h}$
 - 20 mA current value = $10 \text{ m}^3/\text{h}$
- If the effective flow exceeds or falls below this measuring range, the diagnostic message **△S441 Curr.output 1 to n** is displayed.

"Forward/Reverse" option



A0013758

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

* Visibility depends on order options or device settings

- The current output signal is independent of the direction of flow (absolute amount of the measured variable). The values for the **0/4 mA value** parameter (→ ⓘ 119) and **20 mA value** parameter (→ ⓘ 121) must have the same sign.
- The value for the **20 mA value** parameter (→ ⓘ 121) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (→ ⓘ 121) (e.g. forward flow).

"Rev. flow comp." option

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

If buffering cannot be processed within approx. 60 s, the diagnostic message ⓘS441 Curr.output 1 to n is displayed.

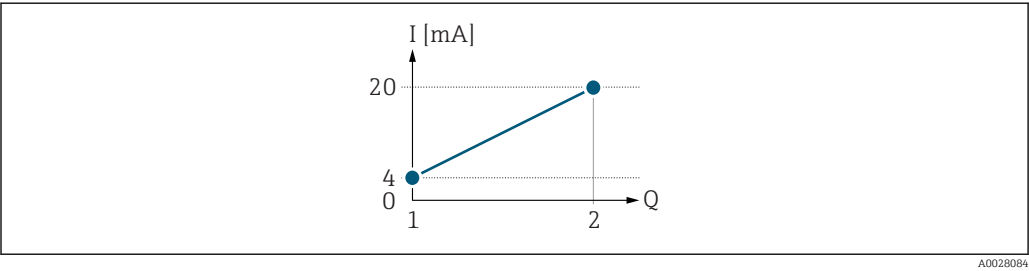
Flow values can aggregate in the buffer in the event of prolonged and unwanted fluid reverse flow. However, these flows are not taken into consideration by the current output configuration, i.e. the reverse flow is not compensated.

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

Examples of how the current output behaves

Example 1

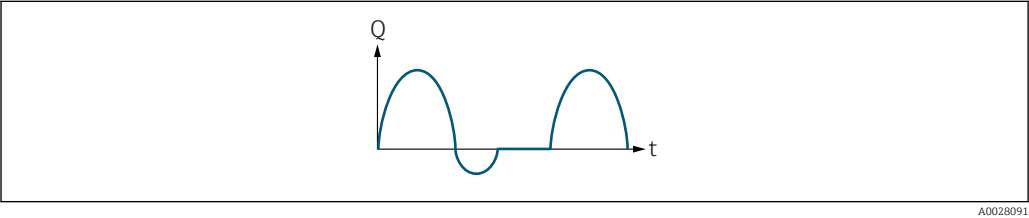
Defined measuring range: lower range value and upper range value with the **same** sign



ⓘ 2 *Measuring range*

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

With the following flow response:

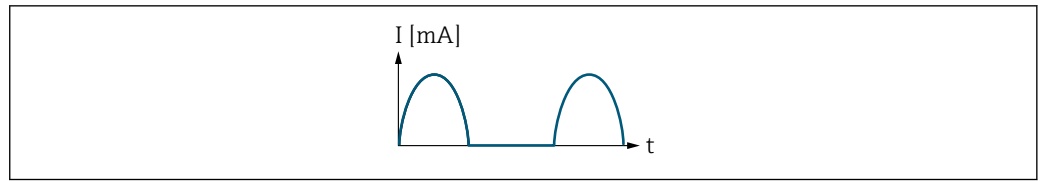


ⓘ 3 *Flow response*

- Q* Flow
- t* Time

With **Forward flow** option

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

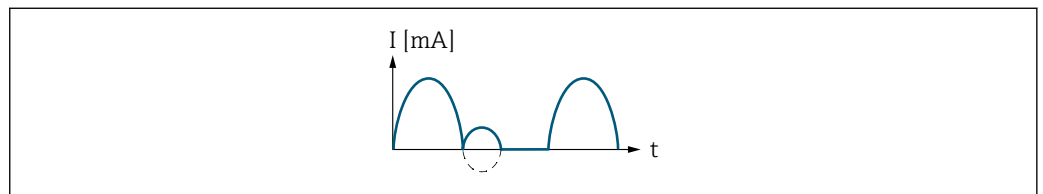


A0028092

I Current
 t Time

With **Forward/Reverse** option

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

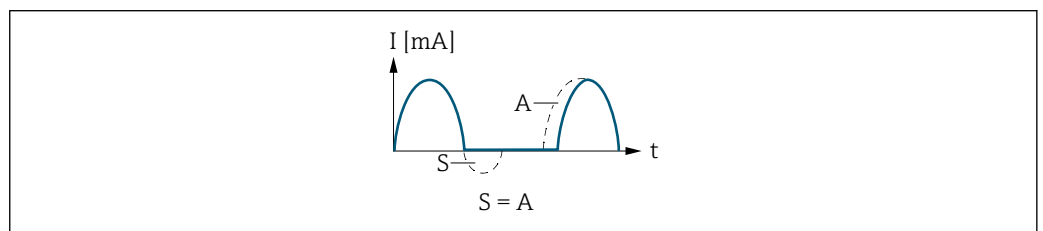


A0028093

I Current
 t Time

With **Rev. flow comp.** option

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

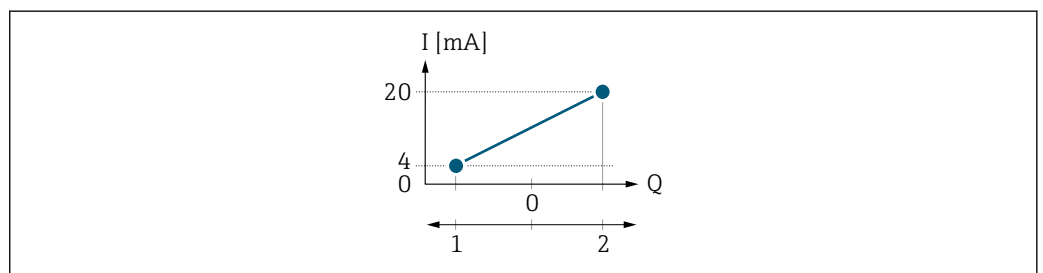


A0028094

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

Example 2

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

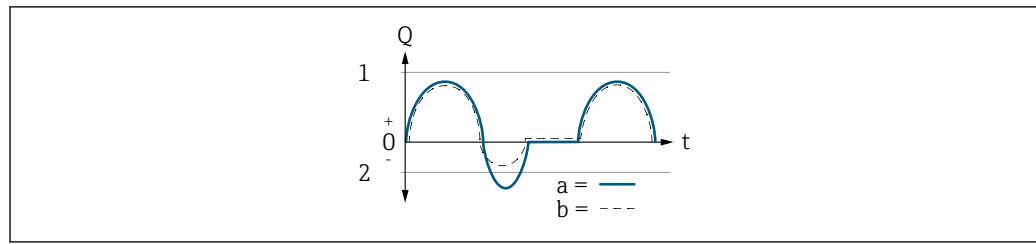


A0028095

4 Measuring range

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

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

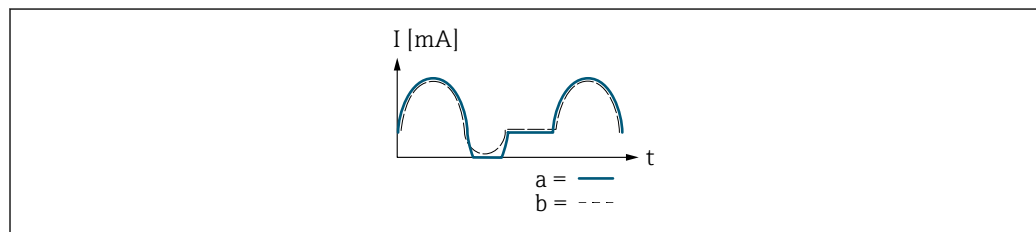


A0028098

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

With **Forward flow** option

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



A0028100

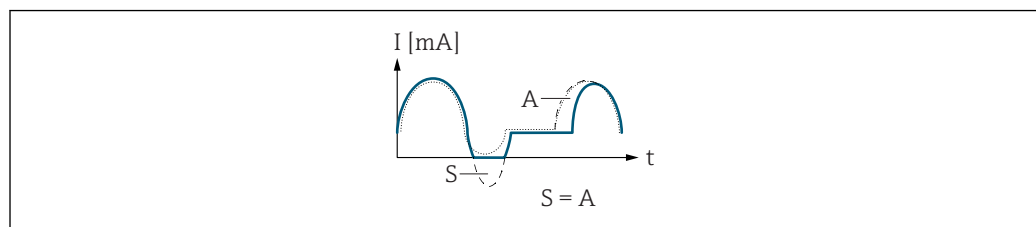
- I* Current
t Time

With **Forward/Reverse** option

This option is not possible in this case as the values for the **0/4 mA value** parameter (→ 119) and **20 mA value** parameter (→ 121) have different signs.

With **Rev. flow comp.** option

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



A0028101

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

**Damping out. 1 to n****Navigation**

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

Prerequisite

One of the following options is selected in the **Assign curr.** parameter (→ 117):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *
- HBSI *



Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry: Value 1 display** parameter (→ 18)

One of the following options is selected in the **Current span** parameter (→ 118):

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

Description

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

User entry

0.0 to 999.9 s

Factory setting

1.0 s

* Visibility depends on order options or device settings

Additional information*Entry*

Use this function to enter a time constant (PT1 element ⁶⁾) for current output damping:

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



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

Response time**Navigation**

Expert → Output → Curr.output 1 to n → Response time (0378-1 to n)

Prerequisite

One of the following options is selected in the **Assign curr.** parameter (→ 117):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *
- HBSI *



Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry: Value 1 display** parameter (→ 18)

One of the following options is selected in the **Current span** parameter (→ 118):

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

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

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

User interface Positive floating-point number

Additional information *Description*

-  The response time is made up of the time specified for the following dampings:
- Current output damping →  127
and
 - Depending on the measured variable assigned to the output.
 - Flow damping
or
 - Density damping
or
 - Temperature damping

Failure mode



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

Prerequisite One of the following options is selected in the **Assign curr.** parameter (→  117):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *
- HBSI *

 Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry: Value 1 display** parameter (→  18)

* Visibility depends on order options or device settings

One of the following options is selected in the **Current span** parameter (→  118):

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

Description

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

Selection

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

Factory setting

Max.

Additional information

Description

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

"Min." option

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

 The signal on alarm level is defined via the **Current span** parameter (→  118).

"Max." option

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

 The signal on alarm level is defined via the **Current span** parameter (→  118).

"Last valid value" option

The current output adopts the last measured value that was valid before the device alarm occurred.

"Actual value" option

The current output adopts the measured value on the basis of the current flow measurement; the device alarm is ignored.

"Defined value" option

The current output adopts a defined measured value.

 The measured value is defined via the **Failure current** parameter (→  130).

Failure current

Navigation

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

Prerequisite

The **Defined value** option is selected in the **Failure mode** parameter (→  129).

Description

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

User entry	0 to 22.5 mA
Factory setting	22.5 mA

Output curr. 1 to n

Navigation	 Expert → Output → Curr.output 1 to n → Output curr. 1 to n (0361–1 to n)
Description	Displays the current value currently calculated for the current output.
User interface	3.59 to 22.5 mA

Measur. curr. 1 to n

Navigation	 Expert → Output → Curr.output 1 to n → Measur. curr. 1 to n (0366–1 to n)
Description	Use this function to display the actual measured value of the output current.
User interface	0 to 30 mA

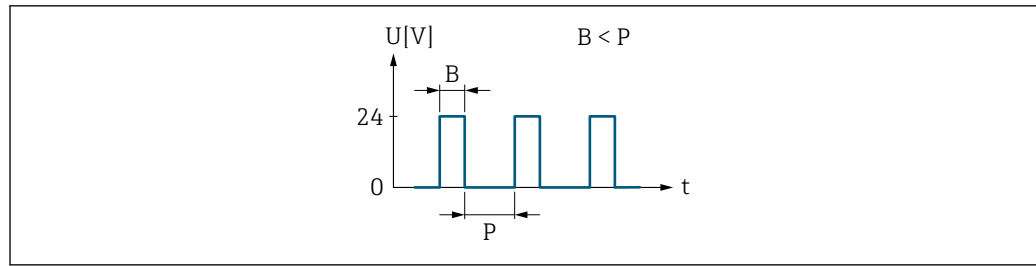
3.5.2 "Pulse/frequency/switch output 1 to n" submenu

Navigation  Expert → Output → PFS output 1 to n

► PFS output 1 to n		
Terminal no. (0492–1 to n)	→ 	133
Signal mode (0490–1 to n)	→ 	133
Operating mode (0469–1 to n)	→ 	133
Assign pulse 1 to n (0460–1 to n)	→ 	135
Value per pulse (0455–1 to n)	→ 	136
Pulse width (0452–1 to n)	→ 	136
Measuring mode (0457–1 to n)	→ 	137
Failure mode (0480–1 to n)	→ 	138

Pulse output 1 to n (0456-1 to n)	→  139
Assign freq. (0478-1 to n)	→  139
Min. freq. value (0453-1 to n)	→  141
Max. freq. value (0454-1 to n)	→  142
Val. at min.freq (0476-1 to n)	→  143
Val. at max.freq (0475-1 to n)	→  144
Measuring mode (0479-1 to n)	→  145
Damping out. 1 to n (0477-1 to n)	→  146
Response time (0491-1 to n)	→  147
Failure mode (0451-1 to n)	→  148
Failure freq. (0474-1 to n)	→  149
Output freq. 1 to n (0471-1 to n)	→  150
Switch out funct (0481-1 to n)	→  150
Assign diag. beh (0482-1 to n)	→  151
Assign limit (0483-1 to n)	→  152
Switch-on value (0466-1 to n)	→  154
Switch-off value (0464-1 to n)	→  154
Assign dir.check (0484-1 to n)	→  155
Assign status (0485-1 to n)	→  155
Switch-on delay (0467-1 to n)	→  155
Switch-off delay (0465-1 to n)	→  156
Failure mode (0486-1 to n)	→  156
Switch status 1 to n (0461-1 to n)	→  156
Invert outp.sig. (0470-1 to n)	→  157

Terminal no.	
Navigation	  Expert → Output → PFS output 1 to n → Terminal no. (0492–1 to n)
Description	Displays the terminal numbers used by the pulse/frequency/switch output module.
User interface	■ Not used ■ 24-25 (I/O 2) ■ 22-23 (I/O 3)
Additional information	<i>"Not used" option</i> The pulse/frequency/switch output module does not use any terminal numbers.
Signal mode 	
Navigation	  Expert → Output → PFS output 1 to n → Signal mode (0490–1 to n)
Description	Use this function to select the signal mode for the pulse/frequency/switch output.
Selection	■ Passive ■ Active
Factory setting	Passive
Operating mode 	
Navigation	  Expert → Output → PFS output 1 to n → Operating mode (0469–1 to n)
Description	Use this function to select the operating mode of the output as a pulse, frequency or switch output.
Selection	■ Pulse ■ Frequency ■ Switch
Factory setting	Pulse
Additional information	<i>"Pulse" option</i> Quantity-dependent pulse with configurable pulse width ■ Whenever a specific mass, volume, corrected volume, target mass or carrier mass is reached (pulse value), a pulse is output, the duration of which was set previously (pulse width). ■ The pulses are never shorter than the set duration. Example ■ Flow rate approx. 100 g/s ■ Pulse value 0.1 g ■ Pulse width 0.05 ms ■ Pulse rate 1 000 Impuls/s



A0026883

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

B Pulse width entered

P Pauses between the individual pulses

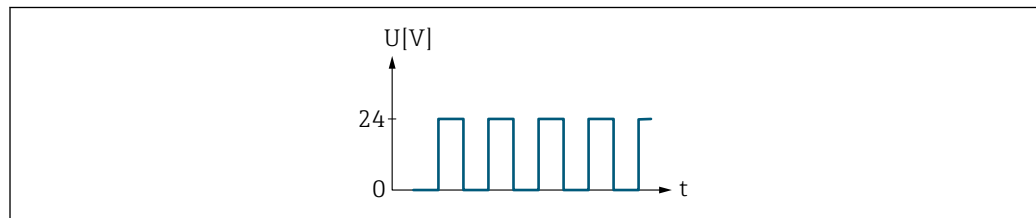
"Frequency" option

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

An output frequency is output that is proportional to the value of a process variable, such as mass flow, volume flow, corrected volume flow, target mass flow, carrier mass flow, density, reference density, concentration, dynamic viscosity, kinematic viscosity, temperature-compensated dynamic viscosity, temperature-compensated kinematic viscosity, temperature, carrier tube temperature, electronic temperature, vibration frequency, frequency fluctuation, oscillation amplitude, oscillation damping, oscillation damping fluctuation, signal asymmetry or excitation current.

Example

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



A0026886

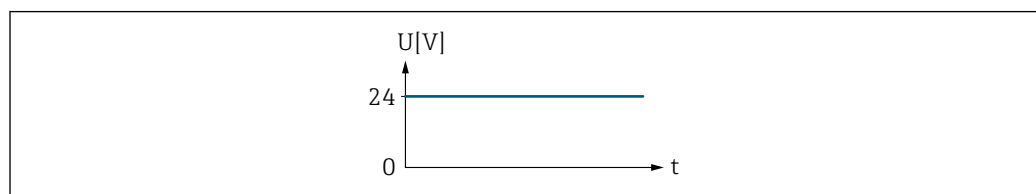
6 Flow-proportional frequency output

"Switch" option

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

Example

Alarm response without alarm

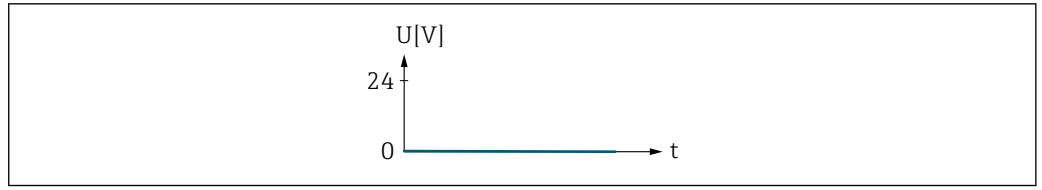


A0026884

7 No alarm, high level

Example

Alarm response in case of alarm



A0026885

 8 Alarm, low level

Assign pulse 1 to n



Navigation

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

Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (→  133).

Description

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

Selection

- Off
- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Target vol. flow
- Carrier vol. fl.
- Targ.corr.vol.fl
- Carr.corr.vol.fl
- GSV flow
- GSVa
- NSV flow
- NSVa
- S&W volume flow
- Oil mass flow
- Water mass flow
- Oil volume flow
- Water vol. flow
- Oil corr.vol.fl.
- Water corr.v.fl.

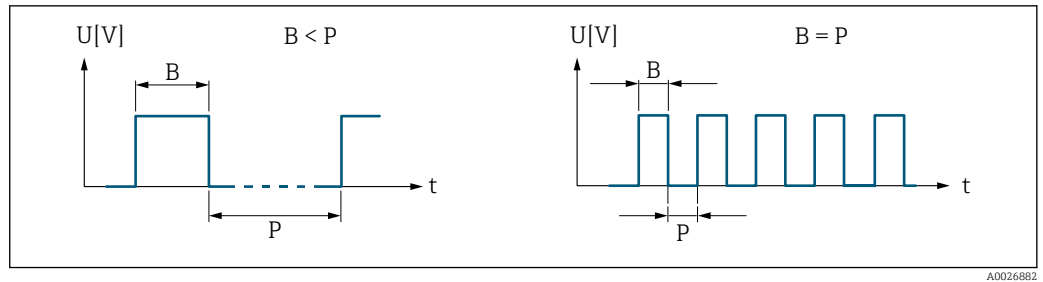
Factory setting

Off

* Visibility depends on order options or device settings

Value per pulse 	
Navigation	  Expert → Output → PFS output 1 to n → Value per pulse (0455-1 to n)
Prerequisite	In the Operating mode parameter (→  133), the Pulse option is selected, and one of the following options is selected in the Assign pulse parameter (→  135): ■ Mass flow ■ Volume flow ■ Correct.vol.flow ■ Target mass flow * ■ Carrier mass fl. *
Description	Use this function to enter the value for the measured value that a pulse is equivalent to.
User entry	Signed floating-point number
Factory setting	Depends on country and nominal diameter →  243
Additional information	<i>Entry</i> Weighting of the pulse output with a quantity. The lower the pulse value, the ■ better the resolution. ■ the higher the frequency of the pulse response.
Pulse width 	
Navigation	  Expert → Output → PFS output 1 to n → Pulse width (0452-1 to n)
Prerequisite	In the Operating mode parameter (→  133), the Pulse option is selected, and one of the following options is selected in the Assign pulse parameter (→  135): ■ Mass flow ■ Volume flow ■ Correct.vol.flow ■ Target mass flow * ■ Carrier mass fl. *
Description	Use this function to enter the duration of the output pulse.
User entry	0.05 to 2 000 ms
Factory setting	100 ms
Additional information	<i>Description</i> ■ Define how long a pulse is (duration). ■ The maximum pulse rate is defined by $f_{\max} = 1 / (2 \times \text{pulse width})$. ■ The interval between two pulses lasts at least as long as the set pulse width. ■ The maximum flow is defined by $Q_{\max} = f_{\max} \times \text{pulse value}$. ■ If the flow exceeds these limit values, the measuring device displays the diagnostic message  S443 Pulse output 1 to n.

* Visibility depends on order options or device settings



B Pulse width entered
P Pauses between the individual pulses

Example

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

Measuring mode



Navigation

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

Prerequisite

In the **Operating mode** parameter (→ 133) the **Pulse** option is selected and in the **Assign pulse** parameter (→ 135) one of the following options is selected:

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *

Description

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

Selection

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

Factory setting

Forward flow

* Visibility depends on order options or device settings

Additional information*Selection*

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

 For a detailed description of the options available, see the **Measuring mode** parameter (→  122)

Examples

 For a detailed description of the configuration examples, see the **Measuring mode** parameter (→  122)

Failure mode**Navigation**

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

Prerequisite

In the **Operating mode** parameter (→  133), the **Pulse** option is selected, and one of the following options is selected in the **Assign pulse** parameter (→  135):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *

Description

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

Selection

- Actual value
- No pulses

Factory setting

No pulses

Additional information*Description*

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

Selection

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

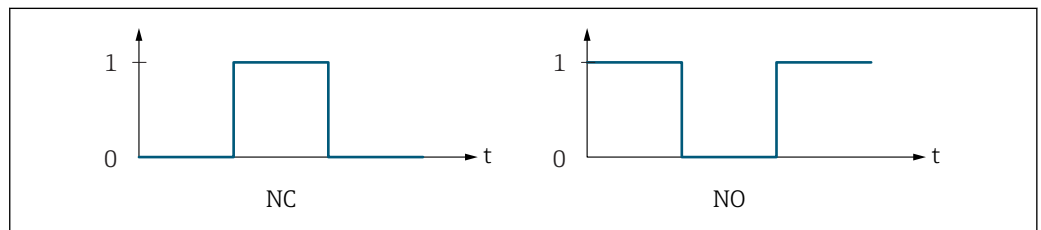
NOTICE! A device alarm is a measuring device error that must be taken seriously. It can affect the measurement quality such that the quality can no longer be guaranteed. The

* Visibility depends on order options or device settings

Actual value option is only recommended if it can be guaranteed that all possible alarm conditions will not affect the measurement quality.

Pulse output 1 to n

Navigation	 Expert → Output → PFS output 1 to n → Pulse output 1 to n (0456–1 to n)
Prerequisite	In the Operating mode parameter (→  133), the Pulse option is selected.
Description	Displays the pulse frequency currently output.
User interface	Positive floating-point number
Additional information	<i>Description</i> ■ The pulse output is an open collector output. ■ This is configured at the factory in such a way that the transistor is conductive for the duration of the pulse (NO contact) and is safety-oriented.



A0028726

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

The output behavior can be reversed via the **Invert outp.sig.** parameter (→  157) i.e. the transistor does not conduct for the duration of the pulse.

In addition, the behavior of the output in the event of a device alarm (**Failure mode** parameter (→  138)) can be configured.

Assign freq.



Navigation	 Expert → Output → PFS output 1 to n → Assign freq. (0478–1 to n)
Prerequisite	The Frequency option is selected in the Operating mode parameter (→  133).
Description	Use this function to select the process variable for the frequency output.  Detailed description of the options Oscil. frequency, Oscil. amplitude, Oscil. damping and Signal asymmetry: Value 1 display parameter (→  18)
Selection	■ Off ■ Mass flow ■ Volume flow ■ Correct.vol.flow

- Target mass flow *
- Carrier mass fl. *
- Target vol. flow
- Carrier vol. fl.
- Targ.corr.vol.fl
- Carr.corr.vol.fl
- Density
- Ref.density
- Ref.dens.altern.
- GSV flow
- GSVa
- NSV flow
- NSVa
- S&W volume flow
- Water cut
- Oil density
- Water density
- Oil mass flow
- Water mass flow
- Oil volume flow
- Water vol. flow
- Oil corr.vol.fl.
- Water corr.v.fl.
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *
- HBSI
- Pressure

Factory setting

Off

* Visibility depends on order options or device settings

Min. freq. value	
Navigation	Expert → Output → PFS output 1 to n → Min. freq. value (0453-1 to n)
Prerequisite	In the Operating mode parameter (→ 133), the Frequency option is selected, and one of the following options is selected in the Assign freq. parameter (→ 139): ■ Mass flow ■ Volume flow ■ Correct.vol.flow ■ Target mass flow * ■ Carrier mass fl. * ■ Density ■ Ref.density ■ Concentration * ■ Dynam. viscosity * ■ Kinematic visc. * ■ TempCompDynVisc * ■ TempCompKinVisc * ■ Temperature ■ Carr. pipe temp. * ■ Electronic temp. ■ Osc. freq. 0 ■ Osc. freq. 1 * ■ Freq. fluct. 0 ■ Freq. fluct. 1 * ■ Osc. ampl. 0 * ■ Osc. ampl. 1 * ■ Osc. damping 0 ■ Osc. damping 1 * ■ Osc.damp.fluct 0 ■ Osc.damp.fluct 1 * ■ Signal asymmetry ■ Exc. current 0 ■ Exc. current 1 * Detailed description of the options Oscil. frequency, Oscil. amplitude, Oscil. damping and Signal asymmetry: Value 1 display parameter (→ 18)
Description	Use this function to enter the start value frequency.
User entry	0.0 to 10 000.0 Hz
Factory setting	0.0 Hz

* Visibility depends on order options or device settings

Max. freq. value	
Navigation	 Expert → Output → PFS output 1 to n → Max. freq. value (0454-1 to n)
Prerequisite	In the Operating mode parameter (→  133), the Frequency option is selected, and one of the following options is selected in the Assign freq. parameter (→  139): ■ Mass flow ■ Volume flow ■ Correct.vol.flow ■ Target mass flow * ■ Carrier mass fl. * ■ Density ■ Ref.density ■ Concentration * ■ Dynam. viscosity * ■ Kinematic visc. * ■ TempCompDynVisc * ■ TempCompKinVisc * ■ Temperature ■ Carr. pipe temp. * ■ Electronic temp. ■ Osc. freq. 0 ■ Osc. freq. 1 * ■ Freq. fluct. 0 ■ Freq. fluct. 1 * ■ Osc. ampl. 0 * ■ Osc. ampl. 1 * ■ Osc. damping 0 ■ Osc. damping 1 * ■ Osc.damp.fluct 0 ■ Osc.damp.fluct 1 * ■ Signal asymmetry ■ Exc. current 0 ■ Exc. current 1 *  Detailed description of the options Oscil. frequency, Oscil. amplitude, Oscil. damping and Signal asymmetry: Value 1 display parameter (→  18)
Description	Use this function to enter the end value frequency.
User entry	0.0 to 10 000.0 Hz
Factory setting	10 000.0 Hz

* Visibility depends on order options or device settings

Val. at min.freq**Navigation**

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

Prerequisite

In the **Operating mode** parameter (→  133), the **Frequency** option is selected, and one of the following options is selected in the **Assign freq.** parameter (→  139):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *



Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry: Value 1 display** parameter (→  18)

Description

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

User entry

Signed floating-point number

Factory setting

Depends on country and nominal diameter

Additional information

Dependency



The entry depends on the process variable selected in the **Assign freq.** parameter (→  139).

* Visibility depends on order options or device settings

Val. at max.freq	
Navigation	Expert → Output → PFS output 1 to n → Val. at max.freq (0475-1 to n)
Prerequisite	In the Operating mode parameter (→ 133), the Frequency option is selected, and one of the following options is selected in the Assign freq. parameter (→ 139): ■ Mass flow ■ Volume flow ■ Correct.vol.flow ■ Target mass flow * ■ Carrier mass fl. * ■ Density ■ Ref.density ■ Concentration * ■ Dynam. viscosity * ■ Kinematic visc. * ■ TempCompDynVisc * ■ TempCompKinVisc * ■ Temperature ■ Carr. pipe temp. * ■ Electronic temp. ■ Osc. freq. 0 ■ Osc. freq. 1 * ■ Freq. fluct. 0 ■ Freq. fluct. 1 * ■ Osc. ampl. 0 * ■ Osc. ampl. 1 * ■ Osc. damping 0 ■ Osc. damping 1 * ■ Osc.damp.fluct 0 ■ Osc.damp.fluct 1 * ■ Signal asymmetry ■ Exc. current 0 ■ Exc. current 1 * Detailed description of the options Oscil. frequency, Oscil. amplitude, Oscil. damping and Signal asymmetry: Value 1 display parameter (→ 18)
Description	Use this function to enter the measured value for the end value frequency.
User entry	Signed floating-point number
Factory setting	Depends on country and nominal diameter
Additional information	<i>Description</i> Use this function to enter the maximum measured value at the maximum frequency. The selected process variable is output as a proportional frequency. <i>Dependency</i> The entry depends on the process variable selected in the Assign freq. parameter (→ 139).

* Visibility depends on order options or device settings

**Measuring mode****Navigation**

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

Prerequisite

In the **Operating mode** parameter (→  133) the **Frequency** option is selected and in the **Assign freq.** parameter (→  139) one of the following options is selected:

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *



Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry: Value 1 display** parameter (→  18)

Description

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

Selection

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

Factory setting

Forward flow

Additional information*Selection*

For a detailed description of the options available, see the **Measuring mode** parameter (→  122)

Examples

For a detailed description of the configuration examples, see the **Measuring mode** parameter (→  122)

* Visibility depends on order options or device settings

Damping out. 1 to n



Navigation

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

Prerequisite

In the **Operating mode** parameter (→ 133) the **Frequency** option is selected and in the **Assign freq.** parameter (→ 139) one of the following options is selected:

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *



Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry: Value 1 display** parameter (→ 18)

Description

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

User entry

0 to 999.9 s

Factory setting

0.0 s

Additional information

User entry

Use this function to enter a time constant (PT1 element ⁷⁾) for frequency output damping:

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



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

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

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

Response time

Navigation

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

Prerequisite

In the **Operating mode** parameter (→  133) the **Frequency** option is selected and in the **Assign freq.** parameter (→  139) one of the following options is selected:

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *



Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry: Value 1 display** parameter (→  18)

Description

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

User interface

Positive floating-point number

* Visibility depends on order options or device settings

Additional information*Description*

-  The response time is made up of the time specified for the following dampings:
- Damping of pulse/frequency/switch output →  127 and
 - Depending on the measured variable assigned to the output.
 - Flow damping or
 - Density damping or
 - Temperature damping

Failure mode**Navigation**

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

Prerequisite

In the **Operating mode** parameter (→  133), the **Frequency** option is selected, and one of the following options is selected in the **Assign freq.** parameter (→  139):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *

 Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry: Value 1 display** parameter (→  18)

Description

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

* Visibility depends on order options or device settings

Selection	■ Actual value ■ Defined value ■ 0 Hz
Factory setting	0 Hz
Additional information	<i>Selection</i> ■ Actual value In the event of a device alarm, the frequency output continues on the basis of the current flow measurement. The device alarm is ignored. ■ Defined value In the event of a device alarm, the frequency output continues on the basis of a predefined value. The Failure freq. (→ 149) replaces the current measured value, making it possible to bypass the device alarm. The actual measurement is switched off for the duration of the device alarm. ■ 0 Hz In the event of a device alarm, the frequency output is "switched off". NOTICE! A device alarm is a measuring device error that must be taken seriously. It can affect the measurement quality such that the quality can no longer be guaranteed. The Actual value option is only recommended if it can be guaranteed that all possible alarm conditions will not affect the measurement quality.

Failure freq.



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

Prerequisite In the **Operating mode** parameter (→ 133), the **Frequency** option is selected, and one of the following options is selected in the **Assign freq.** parameter (→ 139):

- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Osc. ampl. 0 *
- Osc. ampl. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0

* Visibility depends on order options or device settings

- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *



Detailed description of the options **Oscil. frequency**, **Oscil. amplitude**, **Oscil. damping** and **Signal asymmetry: Value 1 display** parameter (→ 18)

Description	Use this function to enter the value for the frequency output in the event of a device alarm in order to bypass the alarm.
User entry	0.0 to 12 500.0 Hz
Factory setting	0.0 Hz

Output freq. 1 to n

Navigation	Expert → Output → PFS output 1 to n → Output freq. 1 to n (0471–1 to n)
Prerequisite	In the Operating mode parameter (→ 133), the Frequency option is selected.
Description	Displays the actual value of the output frequency which is currently measured.
User interface	0.0 to 12 500.0 Hz

Switch out funct



Navigation	Expert → Output → PFS output 1 to n → Switch out funct (0481–1 to n)
Prerequisite	The Switch option is selected in the Operating mode parameter (→ 133).
Description	Use this function to select a function for the switch output.
Selection	■ Off ■ On ■ Diag. behavior ■ Limit ■ Fl. direct.check ■ Status
Factory setting	Off

* Visibility depends on order options or device settings

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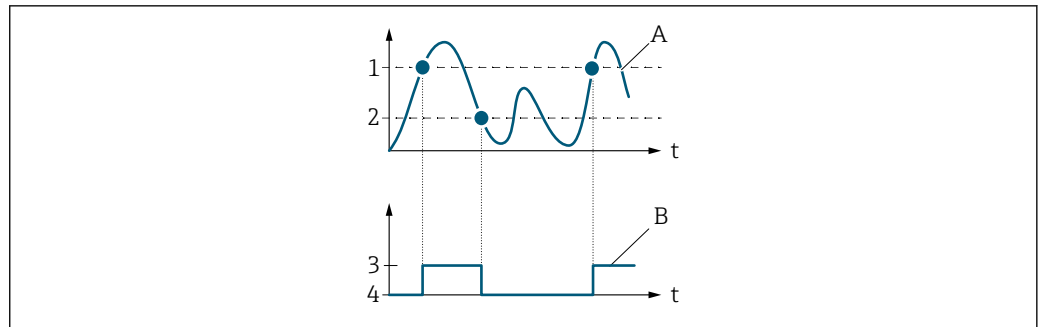
Assign diag. beh



Navigation	Expert → Output → PFS output 1 to n → Assign diag. beh (0482–1 to n)
Prerequisite	■ In the Operating mode parameter (→ 133), the Switch option is selected. ■ In the Switch out funct parameter (→ 150), the Diag. behavior option is selected.
Description	Use this function to select the diagnostic event category that is displayed for the switch output.
Selection	■ Alarm ■ Alarm or warning ■ Warning
Factory setting	Alarm
Additional information	<i>Description</i> If no diagnostic event is pending, the switch output is closed and conductive. <i>Selection</i> ■ Alarm The switch output signals only diagnostic events in the alarm category. ■ Alarm or warning The switch output signals diagnostic events in the alarm and warning category. ■ Warning The switch output signals only diagnostic events in the warning category.

Assign limit	
Navigation	Expert → Output → PFS output 1 to n → Assign limit (0483-1 to n)
Prerequisite	■ The Switch option is selected in the Operating mode parameter (→ 133). ■ The Limit option is selected in the Switch out funct parameter (→ 150).
Description	Use this function to select a process variable for the limit function.
Selection	■ Mass flow ■ Volume flow ■ Correct.vol.flow ■ Target mass flow * ■ Carrier mass fl. * ■ Target vol. flow ■ Carrier vol. fl. ■ Targ.corr.vol.fl ■ Carr.corr.vol.fl ■ Density ■ Ref.density ■ Ref.dens.altern. ■ GSV flow ■ GSVa ■ NSV flow ■ NSVa ■ S&W volume flow ■ Water cut ■ Oil density ■ Water density ■ Oil mass flow ■ Water mass flow ■ Oil volume flow ■ Water vol. flow ■ Oil corr.vol.fl. ■ Water corr.v.fl. ■ Dynam. viscosity * ■ Concentration * ■ Kinematic visc. * ■ TempCompDynVisc * ■ TempCompKinVisc * ■ Temperature ■ Totalizer 1 ■ Totalizer 2 ■ Totalizer 3 ■ Oscil. damping ■ Pressure
Factory setting	Mass flow
Additional information	<i>Description</i> Behavior of status output when Switch-on value > Switch-off value: ■ Process variable > Switch-on value: transistor is conductive ■ Process variable < Switch-off value: transistor is non-conductive

* Visibility depends on order options or device settings

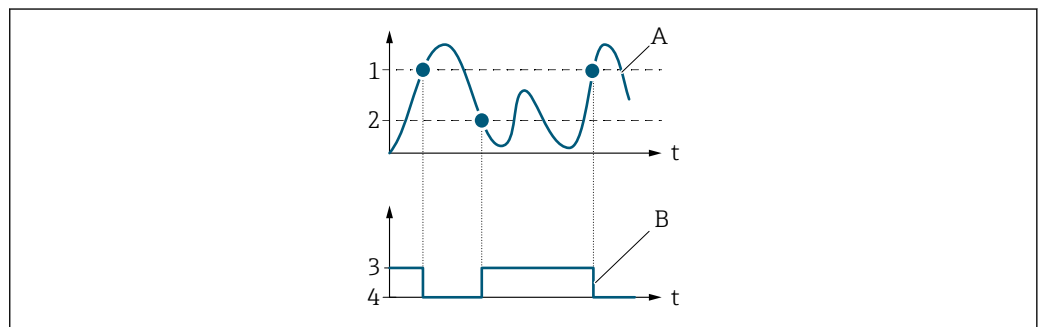


A0026891

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

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

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

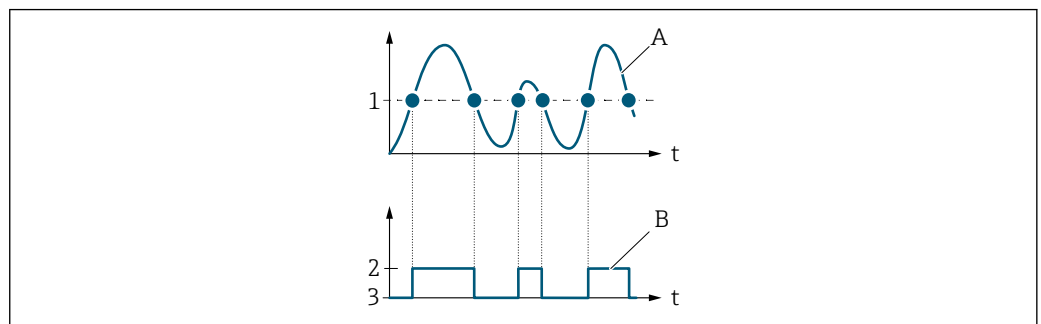


A0026892

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

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

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



A0026893

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

Switch-on value 	
Navigation	 Expert → Output → PFS output 1 to n → Switch-on value (0466–1 to n)
Prerequisite	■ In the Operating mode parameter (→  133), the Switch option is selected. ■ In the Switch out funct parameter (→  150), the Limit option is selected.
Description	Use this function to enter the measured value for the switch-on point.
User entry	Signed floating-point number
Factory setting	Country-specific: ■ 0 kg/h ■ 0 lb/min
Additional information	<i>Description</i> Use this function to enter the limit value for the switch-on value (process variable > switch-on value = closed, conductive).  When using a hysteresis: Switch-on value > Switch-off value. <i>Dependency</i>  The unit depends on the process variable selected in the Assign limit parameter (→  152).
Switch-off value 	
Navigation	 Expert → Output → PFS output 1 to n → Switch-off value (0464–1 to n)
Prerequisite	■ In the Operating mode parameter (→  133), the Switch option is selected. ■ In the Switch out funct parameter (→  150), the Limit option is selected.
Description	Use this function to enter the measured value for the switch-off point.
User entry	Signed floating-point number
Factory setting	Country-specific: ■ 0 kg/h ■ 0 lb/min
Additional information	<i>Description</i> Use this function to enter the limit value for the switch-off value (process variable < switch-off value = open, non-conductive).  When using a hysteresis: Switch-on value > Switch-off value. <i>Dependency</i>  The unit depends on the process variable selected in the Assign limit parameter (→  152).

Assign dir.check



Navigation	 Expert → Output → PFS output 1 to n → Assign dir.check (0484–1 to n)
Prerequisite	■ The Switch option is selected in the Operating mode parameter (→  133). ■ The Fl. direct.check option is selected in the Switch out funct parameter (→  150).
Description	Use this function to select a process variable for monitoring the flow direction.
Selection	■ Off ■ Volume flow ■ Mass flow ■ Correct.vol.flow
Factory setting	Mass flow

Assign status



Navigation	 Expert → Output → PFS output 1 to n → Assign status (0485–1 to n)
Prerequisite	■ The Switch option is selected in the Operating mode parameter (→  133). ■ The Status option is selected in the Switch out funct parameter (→  150).
Description	Use this function to select a device status for the switch output.
Selection	■ Partial pipe det ■ Low flow cut off ■ Profinet Slot 24 ■ Profinet Slot 25 ■ Profinet Slot 26
Factory setting	Partial pipe det
Additional information	<i>Options</i> If empty pipe detection or low flow cut off are enabled, the output is conductive. Otherwise, the switch output is non-conductive.

Switch-on delay



Navigation	 Expert → Output → PFS output 1 to n → Switch-on delay (0467–1 to n)
Prerequisite	■ The Switch option is selected in the Operating mode parameter (→  133). ■ The Limit option is selected in the Switch out funct parameter (→  150).
Description	Use this function to enter a delay time for switching on the switch output.
User entry	0.0 to 100.0 s

Factory setting 0.0 s

Switch-off delay



Navigation Expert → Output → PFS output 1 to n → Switch-off delay (0465–1 to n)

Prerequisite

- The **Switch** option is selected in the **Operating mode** parameter (→ 133).
- The **Limit** option is selected in the **Switch out funct** parameter (→ 150).

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

User entry 0.0 to 100.0 s

Factory setting 0.0 s

Failure mode



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

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

Selection

- Actual status
- Open
- Closed

Factory setting Open

Additional information *Options*

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

Switch status 1 to n

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

Prerequisite The **Switch** option is selected in the **Operating mode** parameter (→ 133).

Description Displays the current switch status of the status output.

User interface

- Open
- Closed

Additional information

User interface

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

Invert outp.sig.

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

Description

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

Selection

- No
- Yes

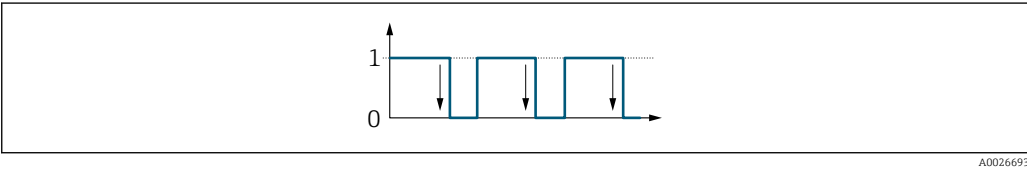
Factory setting

No

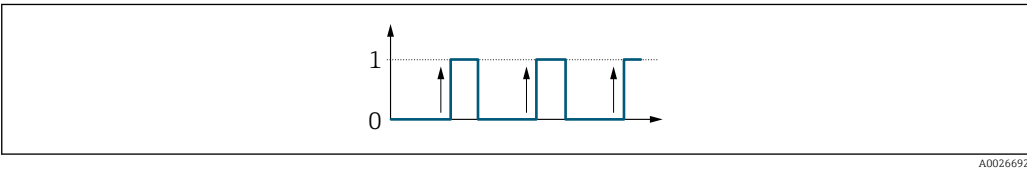
Additional information

Selection

No option (passive - negative)



Yes option (passive - positive)



3.5.3 "Relay output 1 to n" submenu

Navigation  Expert → Output → Relay output 1 to n

► Relay output 1 to n

Terminal no.

→  158

Relay outp.func.

→  158

Assign dir.check	→ 159
Assign limit	→ 159
Assign diag. beh	→ 160
Assign status	→ 161
Switch-off value	→ 161
Switch-off delay	→ 162
Switch-on value	→ 162
Switch-on delay	→ 163
Failure mode	→ 163
Switch status	→ 163
Powerless relay	→ 164

Terminal no.

Navigation	Expert → Output → Relay output 1 to n → Terminal no. (0812-1 to n)
Description	Displays the terminal numbers used by the relay output module.
User interface	- Not used 24-25 (I/O 2) 22-23 (I/O 3)
Additional information	"Not used" option The relay output module does not use any terminal numbers.

Relay outp.func.

Navigation	Expert → Output → Relay output 1 to n → Relay outp.func. (0804-1 to n)
Description	Use this function to select an output function for the relay output.
Selection	- Closed - Open - Diag. behavior

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

Assign dir.check

Navigation	  Expert → Output → Relay output 1 to n → Assign dir.check (0808–1 to n)
Prerequisite	In the Relay outp.func. parameter (→  158), the Fl. direct.check option is selected.
Description	Use this function to select a process variable for monitoring the flow direction.
Selection	■ Off ■ Volume flow ■ Mass flow ■ Correct.vol.flow
Factory setting	Mass flow

Assign limit

Navigation	  Expert → Output → Relay output 1 to n → Assign limit (0807–1 to n)
Prerequisite	In the Relay outp.func. parameter (→  158), the Limit option is selected.
Description	Use this function to select a process variable for the limit value function.
Selection	■ Mass flow ■ Volume flow ■ Correct.vol.flow

- Target mass flow *
- Carrier mass fl. *
- Target vol. flow
- Carrier vol. fl.
- Targ.corr.vol.fl
- Carr.corr.vol.fl
- Density
- Ref.density
- Ref.dens.altern.
- GSV flow
- GSVa
- NSV flow
- NSVa
- S&W volume flow
- Water cut
- Oil density
- Water density
- Oil mass flow
- Water mass flow
- Oil volume flow
- Water vol. flow
- Oil corr.vol.fl.
- Water corr.v.fl.
- Dynam. viscosity *
- Concentration *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Oscil. damping
- Pressure

Factory setting

Mass flow

Assign diag. beh**Navigation**

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

PrerequisiteIn the **Relay outp.func.** parameter (→ 158), the **Diag. behavior** option is selected.**Description**

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

Selection

- Alarm
- Alarm or warning
- Warning

Factory setting

Alarm

* Visibility depends on order options or device settings

Additional information*Description*

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

Selection

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

Assign status**Navigation**

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

Prerequisite

In the **Relay outp.func.** parameter (→ 158), the **Digital Output** option is selected.

Description

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

Selection

- Partial pipe det
- Low flow cut off
- Profinet Slot 24
- Profinet Slot 25
- Profinet Slot 26

Factory setting

Partial pipe det

Switch-off value**Navigation**

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

Prerequisite

In the **Relay outp.func.** parameter (→ 158), the **Limit** option is selected.

Description

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

User entry

Signed floating-point number

Factory setting

Country-specific:

- 0 kg/h
- 0 lb/min

Additional information	<i>Description</i> Use this function to enter the limit value for the switch-off value (process variable < switch-off value = open, non-conductive).  When using a hysteresis: Switch-on value > Switch-off value. <i>Dependency</i>  The unit is dependent on the process variable selected in the Assign limit parameter (→  159).
-------------------------------	---

Switch-off delay	
Navigation	  Expert → Output → Relay output 1 to n → Switch-off delay (0813–1 to n)
Prerequisite	In the Relay outp.func. parameter (→  158), the Limit option is selected.
Description	Use this function to enter a delay time for switching off the switch output.
User entry	0.0 to 100.0 s
Factory setting	0.0 s

Switch-on value	
Navigation	  Expert → Output → Relay output 1 to n → Switch-on value (0810–1 to n)
Prerequisite	In the Relay outp.func. parameter (→  158), the Limit option is selected.
Description	Use this function to enter the measured value for the switch-on point.
User entry	Signed floating-point number
Factory setting	Country-specific: ■ 0 kg/h ■ 0 lb/min

Additional information	<i>Description</i> Use this function to enter the limit value for the switch-on value (process variable > switch-on value = closed, conductive).  When using a hysteresis: Switch-on value > Switch-off value. <i>Dependency</i>  The unit is dependent on the process variable selected in the Assign limit parameter (→  159).
-------------------------------	---

Switch-on delay



Navigation	Expert → Output → Relay output 1 to n → Switch-on delay (0814-1 to n)
Prerequisite	In the Relay outp.func. parameter (→ 158), the Limit option is selected.
Description	Use this function to enter a delay time for switching on the switch output.
User entry	0.0 to 100.0 s
Factory setting	0.0 s

Failure mode



Navigation	Expert → Output → Relay output 1 to n → Failure mode (0811-1 to n)
Description	Use this function to select the failure mode of the relay output in the event of a device alarm.
Selection	■ Actual status ■ Open ■ Closed
Factory setting	Open
Additional information	<i>Selection</i> ■ Actual status In the event of a device alarm, faults are ignored and the current behavior of the input value is output by the relay output. The Actual status option behaves in the same way as the current input value. ■ Open In the event of a device alarm, the relay output's transistor is set to non-conductive. ■ Closed In the event of a device alarm, the relay output's transistor is set to conductive.

Switch status

Navigation	Expert → Output → Relay output 1 to n → Switch status (0801-1 to n)
Description	Displays the current status of the relay output.
User interface	■ Open ■ Closed

Additional information	<i>User interface</i> ■ Open The relay output is not conductive. ■ Closed The relay output is conductive.
Powerless relay	
Navigation	 Expert → Output → Relay output 1 to n → Powerless relay (0816-1 to n)
Description	Use this function to select the quiescent state for the relay output.
Selection	■ Open ■ Closed
Factory setting	Open
Additional information	<i>Selection</i> ■ Open The relay output is not conductive. ■ Closed The relay output is conductive.

3.6 "Communication" submenu

Navigation  Expert → Communication

► Communication	
► PROFINET config.	→  165
► PROFINET info	→  166
► Web server	→  168
► WLAN settings	→  172

3.6.1 "PROFINET config." submenu

Navigation  Expert → Communication → PROFINET config.

► PROFINET config.

Name of station (2071)

→  165

Man. spec. diag. (2084)

→  165

Name of station

Navigation	 Expert → Communication → PROFINET config. → Name of station (2071)
Description	Displays a unique name for the measuring point so it can be identified quickly within the plant.
User entry	Max. 240 characters such as lower-case letters or numbers
Factory setting	eh-promass300-xxxxx
Additional information	<i>Description</i> The device tag corresponds to the device name ("Name Of Station" of PROFINET specification) The device name can be adjusted via DIP switch or the automation system. <i>Factory setting</i> Structure of the device tag: eh-promass300-xxxxx – eh: Endress+Hauser – promass: Instrument family – 300: Transmitter – xxxxx: Serial number of the device

Man. spec. diag.

Navigation	 Expert → Communication → PROFINET config. → Man. spec. diag. (2084)
Description	Use this function to enable the transfer of manufacturer-specific diagnostic events.
Selection	■ Not active ■ Active
Factory setting	Active

Additional information

Description

- Active
In addition to the PROFINET standard alarms, active manufacturing-specific diagnostic events are also transferred to the automation system. The diagnostic number and the error text of the respective diagnostic event are displayed.
- Not active
Only the PROFINET standard alarms are transferred to the automation system.

Selection

This selection affects PROFINET communication only.

Diagnostic events are displayed in the DTM or web server regardless of the selection made in this parameter. The PROFINET standard alarms (diagnosis and process) for the stack are also unaffected by the selected made.

3.6.2 "PROFINET info" submenu

Navigation  Expert → Communication → PROFINET info

► PROFINET info

Device type (2083)

Device ID (2073)

Device revision (2072)

AR state (2088)

MRP role (2085)

State MRP port 1 (2086)

State MRP port 2 (2087)

→  166

→  167

→  167

→  167

→  167

→  168

→  168

Device type

Navigation

 Expert → Communication → PROFINET info → Device type (2083)

Description

Displays the device type (device type code).

User interface

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

Factory setting

Promass 300v

Device ID

Navigation	  Expert → Communication → PROFINET info → Device ID (2073)
Description	Use this function to display the device ID.
User interface	0 to 65 535

Device revision

Navigation	  Expert → Communication → PROFINET info → Device revision (2072)
Description	Use this function to display the device revision.
User interface	0 to 65 535
Additional information	<i>Description</i> The device revision enables the correct assignment of device drivers to the device.

AR state

Navigation	  Expert → Communication → PROFINET info → AR state (2088)
Description	Displays whether an active AR (Application Relation) connection has been established.
User interface	■ Active ■ Not active
Factory setting	Not active

MRP role

Navigation	  Expert → Communication → PROFINET info → MRP role (2085)
Description	Displays the current status of the MRP (Media Redundancy Protocol) role. When a connection is established, an MRP role is assigned to the measuring device if MRP was enabled in the controller.
User interface	■ MRP deactivated ■ Client activated ■ Manager active
Factory setting	MRP deactivated

State MRP port 1

Navigation	 Expert → Communication → PROFINET info → State MRP port 1 (2086)
Description	Displays the status of MRP port 1 if an MRP connection has been established.
User interface	■ Port deactivated ■ Port blocking ■ Port forwarding
Factory setting	Port deactivated
Additional information	<i>Selection</i> ■ Port forwarding The ring is closed. ■ Port blocking The ring is open.

State MRP port 2

Navigation	 Expert → Communication → PROFINET info → State MRP port 2 (2087)
Description	Displays the status of MRP port 2 if an MRP connection has been established.
User interface	■ Port deactivated ■ Port blocking ■ Port forwarding
Factory setting	Port deactivated
Additional information	<i>Selection</i> ■ Port forwarding The ring is closed. ■ Port blocking The ring is open.

3.6.3 "Web server" submenu

Navigation  Expert → Communication → Web server

► Web server

Webserv.language (7221)

→  169

MAC Address (7214)

→  169

IP address (7209)	→ 170
Subnet mask (7211)	→ 170
Default gateway (7210)	→ 171
Webserver funct. (7222)	→ 171
Login page (7273)	→ 171

Webserv.language

Navigation  Expert → Communication → Web server → Webserv.language (7221)

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

Selection

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

Factory setting English

MAC Address

Navigation  Expert → Communication → Web server → MAC Address (7214)

Description Displays the MAC ⁸⁾ 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

8) Media Access Control

Additional information	<i>Example</i> For the display format 00:07:05:10:01:5F
-------------------------------	---

DHCP client	
--------------------	---

Navigation	  Expert → Communication → Web server → DHCP client (7212)
-------------------	--

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

Selection	■ Off ■ On
------------------	--

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

Additional information	<i>Result</i> If the DHCP client functionality of the Web server is activated, the IP address (→  170), Subnet mask (→  170) and Default gateway (→  171) are set automatically.  Identification is via the MAC address of the measuring device.
-------------------------------	--

IP address	
-------------------	---

Navigation	  Expert → Communication → Web server → IP address (7209)
-------------------	---

Description	Displays the IP address of the device's web server.
--------------------	---

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

Factory setting	0.0.0.0
------------------------	---------

Subnet mask	
--------------------	--

Navigation	  Expert → Communication → Web server → Subnet mask (7211)
-------------------	--

Description	Displays the subnet mask.
--------------------	---------------------------

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

Factory setting	0.0.0.0
------------------------	---------

Default gateway

Navigation	 Expert → Communication → Web server → Default gateway (7210)
Description	Displays the default gateway.
User entry	4 octet: 0 to 255 (in the particular octet)
Factory setting	0.0.0.0

Webserver funct.



Navigation	 Expert → Communication → Web server → Webserver funct. (7222)
Description	Use this function to switch the Web server on and off.
Selection	■ Off ■ On
Factory setting	On
Additional information	<i>Description</i>  Once disabled, the Webserver funct. can only be re-enabled via or the operating tool FieldCare.

Selection

Option	Description
Off	■ The web server is completely disabled. ■ Port 80 is locked.
HTML Off	The HTML version of the web server is not available.
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.

Login page



Navigation	 Expert → Communication → Web server → Login page (7273)
Description	Use this function to select the format of the login page.
Selection	■ Without header ■ With header
Factory setting	With header

3.6.4 "WLAN settings" submenu

Navigation  Expert → Communication → WLAN settings

► WLAN settings		
WLAN (2702)	→ 	173
WLAN mode (2717)	→ 	173
SSID name (2714)	→ 	173
Network security (2705)	→ 	173
Sec. identific. (2718)	→ 	174
User name (2715)	→ 	174
WLAN password (2716)	→ 	174
WLAN IP address (2711)	→ 	175
WLAN MAC address (2703)	→ 	175
WLAN subnet mask (2709)	→ 	175
WLAN MAC address (2703)	→ 	175
WLAN passphrase (2706)	→ 	175
Assign SSID name (2708)	→ 	176
SSID name (2707)	→ 	176
WLAN channel (2704)	→ 	176
Select antenna (2713)	→ 	177
Connection state (2722)	→ 	177
Rec.sig.strength (2721)	→ 	177
WLAN IP address (2711)	→ 	175
Gateway IP addr. (2719)	→ 	177
IP address DNS (2720)	→ 	178

WLAN



Navigation	 Expert → Communication → WLAN settings → WLAN (2702)
Description	Use this function to enable and disable the WLAN connection.
Selection	■ Disable ■ Enable
Factory setting	Enable

WLAN mode



Navigation	 Expert → Communication → WLAN settings → WLAN mode (2717)
Description	Use this function to select the WLAN mode.
Selection	■ Access point ■ WLAN Client
Factory setting	Access point

SSID name



Navigation	 Expert → Communication → WLAN settings → SSID name (2714)
Prerequisite	The client is activated.
Description	Use this function to enter the user-defined SSID name (max. 32 characters).
User entry	–
Factory setting	–

Network security



Navigation	 Expert → Communication → WLAN settings → Network security (2705)
Description	Use this function to select the type of security for the WLAN interface.
Selection	■ Unsecured ■ WPA2-PSK ■ EAP-PEAP MSCHAP2 ■ EAP-PEAP NoAuth. ■ EAP-TLS

Factory setting WPA2-PSK

Additional information *Selection*

- Unsecured
Access the WLAN connection without identification.
- WPA2-PSK
Access the WLAN connection with a network key.

Sec. identific.

Navigation  Expert → Communication → WLAN settings → Sec. identific. (2718)

Description Use this function to select the security settings (download via the menu: Data Management > Security > Download WLAN).

User interface

- Root certificate
- Device certific.
- Dev. private key

User name



Navigation  Expert → Communication → WLAN settings → User name (2715)

Description Use this function to enter the user name.

User entry –

Factory setting –

WLAN password



Navigation  Expert → Communication → WLAN settings → WLAN password (2716)

Description Use this function to enter the WLAN password.

User entry –

Factory setting –

WLAN IP address



Navigation	Expert → Communication → WLAN settings → WLAN IP address (2711)
Description	Use this function to enter the IP address of the measuring device's WLAN connection.
User entry	4 octet: 0 to 255 (in the particular octet)
Factory setting	192.168.1.212

WLAN MAC address

Navigation	Expert → Communication → WLAN settings → WLAN MAC address (2703)
	Expert → Communication → WLAN settings → WLAN MAC address (2703)
Description	Displays the MAC ⁹⁾ address of the measuring device.
User interface	Unique 12-digit character string comprising letters and numbers
Factory setting	Each measuring device is given an individual address.
Additional information	<i>Example</i> For the display format 00:07:05:10:01:5F

WLAN subnet mask



Navigation	Expert → Communication → WLAN settings → WLAN subnet mask (2709)
Description	Use this function to enter the subnet mask.
User entry	4 octet: 0 to 255 (in the particular octet)
Factory setting	255.255.255.0

WLAN passphrase



Navigation	Expert → Communication → WLAN settings → WLAN passphrase (2706)
Prerequisite	The WPA2-PSK option is selected in the Security type parameter (→ 173).
Description	Use this function to enter the network key.

9) Media Access Control

User entry 8 to 32-digit character string comprising numbers, letters and special characters

Factory setting Serial number of the measuring device (e.g. L100A802000)

Assign SSID name

Navigation   Expert → Communication → WLAN settings → Assign SSID name (2708)

Description Use this function to select which name is used for the SSID ¹⁰⁾.

Selection

- Device tag
- User-defined

Factory setting User-defined

Additional information *Selection*

- Device tag
The device tag name is used as the SSID.
- User-defined
A user-defined name is used as the SSID.

SSID name

Navigation   Expert → Communication → WLAN settings → SSID name (2707)

Prerequisite

- The **User-defined** option is selected in the **Assign SSID name** parameter (→  176).
- The **Access point** option is selected in the **WLAN mode** parameter (→  173).

Description Use this function to enter a user-defined SSID name.

User entry Max. 32-digit character string comprising numbers, letters and special characters

Factory setting EH_device designation_last 7 digits of the serial number (e.g. EH_Promass_300_A802000)

WLAN channel

Navigation   Expert → Communication → WLAN settings → WLAN channel (2704)

Description Use this function to enter the WLAN channel.

User entry 1 to 11

Factory setting 6

¹⁰⁾ Service Set Identifier

Additional information*Description*

- It is only necessary to enter a WLAN channel if multiple WLAN devices are in use.
- If just one measuring device is in use, it is recommended to keep the factory setting.

Select antenna**Navigation**

Expert → Communication → WLAN settings → Select antenna (2713)

Description

Use this function to select whether the external or internal antenna is used for reception.

Selection

- External antenna
- Internal antenna

Factory setting

Internal antenna

Connection state**Navigation**

Expert → Communication → WLAN settings → Connection state (2722)

Description

The connection status is displayed.

User interface

- Connected
- Not connected

Factory setting

Not connected

Rec.sig.strength**Navigation**

Expert → Communication → WLAN settings → Rec.sig.strength (2721)

Description

Displays the signal strength received.

User interface

- Low
- Medium
- High

Factory setting

High

Gateway IP addr.**Navigation**

Expert → Communication → WLAN settings → Gateway IP addr. (2719)

Description

Use this function to enter the IP address of the gateway.

Factory setting 192.168.1.212

IP address DNS

- Navigation
-  Expert → Communication → WLAN settings → IP address DNS (2720)
 -  Expert → Communication → WLAN settings → IP address DNS (2720)

Description Use this function to enter the IP address of the domain name server.

Factory setting 192.168.1.212

3.6.5 "Diag. config." submenu

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

Assign a category to the particular diagnostic event:

Category	Meaning
Failure (F)	A device error is present. The measured value is no longer valid.
Funct. check (C)	The device is in service mode (e.g. during a simulation).
Out of spec. (S)	The device is being operated: – Outside its technical specification limits (e.g. outside the process temperature range) – Outside of the configuration carried out by the user (e.g. maximum flow in parameter 20 mA value)
Mainten. req.(M)	Maintenance is required. The measured value is still valid.
No effect (N)	Has no effect on the condensed status ¹⁾ .

1) Condensed status according to NAMUR recommendation NE107

Navigation  Expert → Communication → Diag. config.

► Diag. config.

Event category 046 (0246)

→  179

Event category 140 (0244)

→  179

Event category 374 (0245)

→  180

Event category 441 (0210)

→  180

Event category 442 (0230)

→  181

Event category 443 (0231)

→  181

Event category 444 (0211)	→  181
Event category 543 (0276)	→  182
Event category 830 (0240)	→  182
Event category 831 (0241)	→  183
Event category 832 (0218)	→  183
Event category 833 (0225)	→  183
Event category 834 (0227)	→  184
Event category 835 (0229)	→  184
Event category 862 (0214)	→  184
Event category 912 (0243)	→  185
Event category 913 (0242)	→  185
Event category 948 (0275)	→  186

Event category 046 (Sensor limit)

Navigation	 Expert → Communication → Diag. config. → Event category 046 (0246)
Description	Use this function to select a category for the diagnostic message 046 Sensor limit .
Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	 For a detailed description of the event categories available for selection: →  178

Event category 140 (Sensor sig.asym.)

Navigation	 Expert → Communication → Diag. config. → Event category 140 (0244)
Description	Use this function to select a category for the diagnostic message 140 Sensor sig.asym..

Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	 For a detailed description of the event categories available for selection: →  178

Event category 274 (Main electronics)



Navigation	 Expert → Communication → Diag. config. → Event category 274 (0245)
Description	Use this function to select a category for the diagnostic message 274 Main electronics .
Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	 For a detailed description of the event categories available for selection: →  178

Event category 441 (Curr.output 1 to n)



Navigation	 Expert → Communication → Diag. config. → Event category 441 (0210)
Description	Use this function to select a category for the diagnostic message 441 Curr.output 1 to n .
Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	 For a detailed description of the event categories available for selection: →  178

Event category 442 (Freq. output 1 to n)



Navigation	Expert → Communication → Diag. config. → Event category 442 (0230)
Prerequisite	The pulse/frequency/switch output is available.
Description	Use this function to select a category for the diagnostic message 442 Freq. output 1 to n .
Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	For a detailed description of the event categories available for selection: → 178

Event category 443 (Pulse output 1 to n)



Navigation	Expert → Communication → Diag. config. → Event category 443 (0231)
Prerequisite	The pulse/frequency/switch output is available.
Description	Use this function to select a category for the diagnostic message 443 Pulse output 1 to n .
Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	For a detailed description of the event categories available for selection: → 178

Event category 444 (Current input 1 to n)



Navigation	Expert → Communication → Diag. config. → Event category 444 (0211)
Prerequisite	The current input is available.
Description	Use this function to select a category for the diagnostic message 444 Current input 1 to n .

Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	<i>Selection</i>  For a detailed description of the event categories available for selection: →  178

Event category 543 (Double pulse out)



Navigation	 Expert → Communication → Diag. config. → Event category 543 (0276)
Description	Use this option to select a category for the diagnostic message 543 Double pulse out.
Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	 For a detailed description of the event categories available for selection: →  178

Event category 830 (Sensor temp.)



Navigation	 Expert → Communication → Diag. config. → Event category 830 (0240)
Description	Use this function to select a category for the diagnostic message 830 Sensor temp..
Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	 For a detailed description of the event categories available for selection: →  178

Event category 831 (Sensor temp.)



Navigation	Expert → Communication → Diag. config. → Event category 831 (0241)
Description	Use this function to select a category for the diagnostic message 831 Sensor temp..
Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	For a detailed description of the event categories available for selection: → 178

Event category 832 (Electronic temp.)



Navigation	Expert → Communication → Diag. config. → Event category 832 (0218)
Description	Use this function to select a category for the diagnostic message 832 Electronic temp..
Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	<i>Selection</i> For a detailed description of the event categories available for selection: → 178

Event category 833 (Electronic temp.)



Navigation	Expert → Communication → Diag. config. → Event category 833 (0225)
Description	Use this option to select a category for the diagnostic message 833 Electronic temp..
Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)

Additional information

Selection

 For a detailed description of the event categories available for selection: →  178

Event category 834 (Process temp.)

Navigation

 Expert → Communication → Diag. config. → Event category 834 (0227)

Description

Use this option to select a category for the diagnostic message **834 Process temp..**

Selection

- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- No effect (N)

Factory setting

Out of spec. (S)

Additional information

Selection

 For a detailed description of the event categories available for selection: →  178

Event category 835 (Process temp.)

Navigation

 Expert → Communication → Diag. config. → Event category 835 (0229)

Description

Use this option to select a category for the diagnostic message **835 Process temp..**

Selection

- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- No effect (N)

Factory setting

Out of spec. (S)

Additional information

Selection

 For a detailed description of the event categories available for selection: →  178

Event category 862 (Empty pipe)

Navigation

 Expert → Communication → Diag. config. → Event category 862 (0214)

Description

Use this option to select a category for the diagnostic message **862 Empty pipe.**

Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	 For a detailed description of the event categories available for selection: →  178

Event category 912 (Medium inhomog.)



Navigation	 Expert → Communication → Diag. config. → Event category 912 (0243)
Description	Use this function to select a category for the diagnostic message 912 Medium inhomog..
Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	 For a detailed description of the event categories available for selection: →  178

Event category 913 (Medium unsuitab.)



Navigation	 Expert → Communication → Diag. config. → Event category 913 (0242)
Description	Use this function to select a category for the diagnostic message 913 Medium unsuitab..
Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	 For a detailed description of the event categories available for selection: →  178

Event category 948 (Tube damp. high)



Navigation	 Expert → Communication → Diag. config. → Event category 948 (0275)
Description	Use this function to assign a category to the diagnostic message 948 Tube damp. high .
Selection	■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ No effect (N)
Factory setting	Out of spec. (S)
Additional information	 For a detailed description of the event categories available for selection: →  178

3.7 "Application" submenu

Navigation   Expert → Application

▶ Application

Reset all tot. (2806)

→  186

▶ Totalizer

→  187

▶ Viscosity

→  192

▶ Concentration

→  192

▶ Petroleum

→  192

Reset all tot.

Navigation	  Expert → Application → Reset all tot. (2806)
Description	Use this function to reset all totalizers to the value 0 and restart the totaling process. This deletes all the flow values previously totaled.
Selection	■ Cancel ■ Reset + totalize
Factory setting	Cancel

Additional information

Selection

Options	Description
Cancel	No action is executed and the user exits the parameter.
Reset + totalize	Resets all totalizers to 0 and restarts the totaling process. This deletes all the flow values previously totalized.

3.7.1 "Totalizer 1 to n" submenu

Navigation

 Expert → Application → Totalizer 1 to n

► Totalizer 1 to n

Assign variable (0914-1 to n)

→  187

Unit totalizer 1 to n (0915-1 to n)

→  188

Operation mode (0908-1 to n)

→  189

Control Tot. 1 to n (0912-1 to n)

→  190

Preset value 1 to n (0913-1 to n)

→  191

Failure mode (0901-1 to n)

→  191

Assign variable



Navigation

 Expert → Application → Totalizer 1 to n → Assign variable (0914-1 to n)

Description

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

Selection

- Off
- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Target vol. flow
- Carrier vol. fl.
- Targ.corr.vol.fl
- Carr.corr.vol.fl
- GSV flow
- GSVa
- NSV flow

* Visibility depends on order options or device settings

- NSVa
- S&W volume flow
- Oil mass flow
- Water mass flow
- Oil volume flow
- Water vol. flow
- Oil corr.vol.fl.
- Water corr.v.fl.

Factory setting Mass 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 variable** parameter (→  187) is still displayed in the **Totalizer 1 to n** submenu. All other parameters in the submenu are hidden.

Unit totalizer 1 to n

Navigation   Expert → Application → Totalizer 1 to n → Unit totalizer 1 to n (0915-1 to n)

Prerequisite One of the following options is selected in the **Assign variable** parameter (→  187) of the **Totalizer 1 to n** submenu:

- Volume flow
- Mass flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *

Description Use this function to select the process variable unit for the Totalizer 1 to n (→  187).

- Selection
- | <i>SI units</i> | <i>US units</i> |
|-----------------|-----------------|
| ■ g | ■ oz |
| ■ kg | ■ lb |
| ■ t | ■ STon |
- or
- | <i>SI units</i> | <i>US units</i> | <i>Imperial units</i> |
|-------------------|-------------------|-----------------------|
| ■ cm ³ | ■ af | ■ gal (imp) |
| ■ dm ³ | ■ ft ³ | ■ Mgal (imp) |
| ■ m ³ | ■ fl oz (us) | ■ bbl (imp;oil) |
| ■ ml | ■ gal (us) | |
| ■ l | ■ kgal (us) | |
| ■ hl | ■ Mgal (us) | |
| ■ Ml Mega | ■ bbl (us;oil) | |
| | ■ bbl (us;tank) | |

* Visibility depends on order options or device settings

	or		
	<i>US units</i> ■ bbl (us;liq.) ■ bbl (us;beer)	<i>Imperial units</i> bbl (imp;beer)	
	or		
	<i>SI units</i> ■ Nl ■ Nm³ ■ Sl ■ Sm³	<i>US units</i> ■ Sft³ ■ Sgal (us) ■ Sbbl (us;liq.)	<i>Imperial units</i> Sgal (imp)
	or		
	<i>Other units</i> None		
Factory setting	Country-specific: ■ kg ■ lb		
Additional information	<i>Description</i>  The unit is selected separately for each totalizer. It is independent of the selection made in the System units submenu (→  63).		
	<i>Selection</i> The selection is dependent on the process variable selected in the Assign variable parameter (→  187).		

Operation mode	
----------------	---

Navigation	 Expert → Application → Totalizer 1 to n → Operation mode (0908-1 to n)
Prerequisite	One of the following options is selected in the Assign variable parameter (→  187) of the Totalizer 1 to n submenu: ■ Volume flow ■ Mass flow ■ Correct.vol.flow ■ Target mass flow[*] ■ Carrier mass fl.[*]
Description	Use this function to select how the totalizer summates the flow.
Selection	■ Net flow total ■ Forward total ■ Reverse total

* Visibility depends on order options or device settings

Factory setting Net flow total

Additional information *Selection*

- Net flow total
Flow values in the forward and reverse flow direction are totalized and balanced against one another. Net flow is registered in the flow direction.
- Forward total
Only the flow in the forward flow direction is totalized.
- Reverse total
Only the flow in the reverse flow direction is totalized (= reverse flow quantity).

Control Tot. 1 to n

Navigation  Expert → Application → Totalizer 1 to n → Control Tot. 1 to n (0912-1 to n)

Prerequisite One of the following options is selected in the **Assign variable** parameter (→  187) of the **Totalizer 1 to n** submenu:

- Volume flow
- Mass flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *

Description Use this function to select the control of totalizer value 1-3.

Selection

- Totalize
- Reset + hold
- Preset + hold
- Reset + totalize
- Preset+totalize
- Hold

Factory setting Totalize

Additional information *Selection*

Options	Description
Totalize	The totalizer is started or continues running.
Reset + hold	The totaling process is stopped and the totalizer is reset to 0.
Preset + hold	The totaling process is stopped and the totalizer is set to its defined start value from the Preset value parameter.
Reset + totalize	The totalizer is reset to 0 and the totaling process is restarted.
Preset+totalize	The totalizer is set to the defined start value from the Preset value parameter and the totaling process is restarted.
Hold	Totalizing is stopped.

* Visibility depends on order options or device settings

Preset value 1 to n

Navigation	 Expert → Application → Totalizer 1 to n → Preset value 1 to n (0913–1 to n)
Prerequisite	One of the following options is selected in the Assign variable parameter (→  187) of the Totalizer 1 to n submenu: ■ Volume flow ■ Mass flow ■ Correct.vol.flow ■ Target mass flow * ■ Carrier mass fl. *
Description	Use this function to enter a start value for the Totalizer 1 to n.
User entry	Signed floating-point number
Factory setting	Country-specific: ■ 0 kg ■ 0 lb
Additional information	<i>Entry</i>  The unit of the selected process variable is specified for the totalizer in the Unit totalizer parameter (→  188). <i>Example</i> This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.

Failure mode



Navigation	 Expert → Application → Totalizer 1 to n → Failure mode (0901–1 to n)
Prerequisite	One of the following options is selected in the Assign variable parameter (→  187) of the Totalizer 1 to n submenu: ■ Volume flow ■ Mass flow ■ Correct.vol.flow ■ Target mass flow * ■ Carrier mass fl. *
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

* Visibility depends on order options or device settings

Additional information*Description*

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

Selection

■ Stop

The totalizer is stopped in the event of a device alarm.

■ Actual value

The totalizer continues to count based on the actual 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.

3.7.2 "Viscosity" submenu

Only available for Promass I.



For detailed information on the parameter descriptions for the **Viscosity** application package, refer to the Special Documentation for the device → 7

Navigation

Expert → Application → Viscosity

► Viscosity

3.7.3 "Concentration" submenu

For detailed information on the parameter descriptions for the **Concentration** application package, refer to the Special Documentation for the device → 7

Navigation

Expert → Application → Concentration

► Concentration

3.7.4 "Petroleum" submenu

For detailed information on the parameter descriptions for the **Petroleum** application package, refer to the Special Documentation for the device → 7

Navigation

Expert → Application → Petroleum

► Petroleum

3.8 "Diagnostics" submenu

Navigation  Expert → Diagnostics

► Diagnostics	
Actual diagnos. (0691)	→  193
Prev.diagnostics (0690)	→  194
Time fr. restart (0653)	→  195
Operating time (0652)	→  195
► Diagnostic list	→  196
► Event logbook	→  200
► Device info	→  202
► Main elec.+I/O1	→  206
► Sens. electronic	→  207
► I/O module 2	→  209
► I/O module 3	→  210
► Display module	→  211
► Min/max val.	→  212
► Data logging	→  223
► Heartbeat	→  232
► Simulation	→  232

Actual diagnos.

Navigation	 Expert → Diagnostics → Actual diagnos. (0691)
Prerequisite	A diagnostic event has occurred.
Description	Displays the current diagnostic message. If two or more messages occur simultaneously, the message with the highest priority is shown on the display.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

 Additional pending diagnostic messages can be viewed in the **Diagnostic list** submenu (→  196).

 Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.

Example

For the display format:

⊗F271 Main electronics

Timestamp**Navigation**

 Expert → Diagnostics → Timestamp

Description

Displays the operating time when the current diagnostic message occurred.

User interface

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

Additional information*Display*

 The diagnostic message can be viewed via the **Actual diagnos.** parameter (→  193).

Example

For the display format:

24d12h13m00s

Prev.diagnostics**Navigation**

  Expert → Diagnostics → Prev.diagnostics (0690)

Prerequisite

Two diagnostic events have already occurred.

Description

Displays the diagnostic message that occurred before the current message.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

 Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.

Example

For the display format:

⊗F271 Main electronics

Timestamp

Navigation	 Expert → Diagnostics → Timestamp
Description	Displays the operating time when the last diagnostic message before the current message occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<i>Display</i>  The diagnostic message can be viewed via the Prev.diagnostics parameter (→  194). <i>Example</i> For the display format: 24d12h13m00s

Time fr. restart

Navigation	  Expert → Diagnostics → Time fr. restart (0653)
Description	Use this function to display the time the device has been in operation since the last device restart.
User interface	Days (d), hours (h), minutes (m) and seconds (s)

Operating time

Navigation	  Expert → Diagnostics → Operating time (0652)
Description	Use this function to display the length of time the device has been in operation.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<i>User interface</i> The maximum number of days is 9999, which is equivalent to 27 years.

3.8.1 "Diagnostic list" submenu

Navigation  Expert → Diagnostics → Diagnostic list

► Diagnostic list		
Diagnostics 1 (0692)	→	 196
Diagnostics 2 (0693)	→	 197
Diagnostics 3 (0694)	→	 198
Diagnostics 4 (0695)	→	 198
Diagnostics 5 (0696)	→	 199

Diagnostics 1

Navigation	 Expert → Diagnostics → Diagnostic list → Diagnostics 1 (0692)
Description	Displays the current diagnostics message with the highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	Display  Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key. Examples For the display format: ■  F271 Main electronics ■  F276 I/O module

Timestamp

Navigation	 Expert → Diagnostics → Diagnostic list → Timestamp
Description	Displays the operating time when the diagnostic message with the highest priority occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)

Additional information*Display*

The diagnostic message can be viewed via the **Diagnostics 1** parameter (→ 196).

Example

For the display format:
24d12h13m00s

Diagnostics 2

Navigation

Expert → Diagnostics → Diagnostic list → Diagnostics 2 (0693)

Description

Displays the current diagnostics message with the second-highest priority.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

Examples

For the display format:

- F271 Main electronics
- F276 I/O module

Timestamp

Navigation

Expert → Diagnostics → Diagnostic list → Timestamp

Description

Displays the operating time when the diagnostic message with the second-highest priority occurred.

User interface

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

Additional information*Display*

The diagnostic message can be viewed via the **Diagnostics 2** parameter (→ 197).

Example

For the display format:
24d12h13m00s

Diagnostics 3

Navigation	 Expert → Diagnostics → Diagnostic list → Diagnostics 3 (0694)
Description	Displays the current diagnostics message with the third-highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.
Additional information	<i>Display</i>  Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key. <i>Examples</i> For the display format: ■  F271 Main electronics ■  F276 I/O module

Timestamp

Navigation	 Expert → Diagnostics → Diagnostic list → Timestamp
Description	Displays the operating time when the diagnostic message with the third-highest priority occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	<i>Display</i>  The diagnostic message can be viewed via the Diagnostics 3 parameter (→  198). <i>Example</i> For the display format: 24d12h13m00s

Diagnostics 4

Navigation	 Expert → Diagnostics → Diagnostic list → Diagnostics 4 (0695)
Description	Displays the current diagnostics message with the fourth-highest priority.
User interface	Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

Examples

For the display format:

- F271 Main electronics
- F276 I/O module

Timestamp

Navigation

Expert → Diagnostics → Diagnostic list → Timestamp

Description

Displays the operating time when the diagnostic message with the fourth-highest priority occurred.

User interface

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

Additional information*Display*

The diagnostic message can be viewed via the **Diagnostics 4** parameter (→ 198).

Example

For the display format:

24d12h13m00s

Diagnostics 5

Navigation

Expert → Diagnostics → Diagnostic list → Diagnostics 5 (0696)

Description

Displays the current diagnostics message with the fifth-highest priority.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information*Display*

Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

Examples

For the display format:

- F271 Main electronics
- F276 I/O module

Timestamp

Navigation	 Expert → Diagnostics → Diagnostic list → Timestamp
Description	Displays the operating time when the diagnostic message with the fifth-highest priority occurred.
User interface	Days (d), hours (h), minutes (m) and seconds (s)
Additional information	Display  The diagnostic message can be viewed via the Diagnostics 5 parameter (→  199). Example For the display format: 24d12h13m00s

3.8.2 "Event logbook" submenu

Navigation  Expert → Diagnostics → Event logbook

► Event logbook

Filter options (0705)

→  200

► Event list

→  201

Filter options

Navigation	 Expert → Diagnostics → Event logbook → Filter options (0705)
Description	Use this function to select the category whose event messages are displayed in the event list of the local display.
Selection	■ All ■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ Information (I)
Factory setting	All

Additional information	Description  The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107: ■ F = Failure ■ C = Function Check ■ S = Out of Specification ■ M = Maintenance Required
Filter options 	
Navigation	 Expert → Diagnostics → Event logbook → Filter options
Description	Use this function to select the category whose event messages are displayed in the event list of the operating tool.
Selection	■ All ■ Failure (F) ■ Funct. check (C) ■ Out of spec. (S) ■ Mainten. req.(M) ■ Information (I)
Factory setting	All
Additional information	Description  The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107: ■ F = Failure ■ C = Function Check ■ S = Out of Specification ■ M = Maintenance Required "Event list" submenu  The Event list submenu is only displayed if operating via the local display. If operating via the FieldCare operating tool, the event list can be read out with a separate FieldCare module. 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 Event list →  202

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 (→ 200).
User interface	■ For a "Category I" event message Information event, short message, symbol for event recording and operating time when error occurred ■ For a "Category F, C, S, M" event message (status signal) Diagnostics code, short message, symbol for event recording and operating time when error occurred
Additional information	<i>Description</i> A maximum of 20 event messages are displayed in chronological order. If the Extended HistoROM application package (order option) is enabled in the device, the event list can contain up to 100 entries . The following symbols indicate whether an event has occurred or has ended: ■ ↺: Occurrence of the event ■ ↻: End of the event <i>Examples</i> For the display format: ■ I1091 Configuration modified ↺ 24d12h13m00s ■ ⦿F271 Main electronics ↺ 01d04h12min30s <i>HistoROM</i> A HistoROM is a "non-volatile" device memory in the form of an EEPROM.

3.8.3 "Device info" submenu

Navigation Expert → Diagnostics → Device info

► Device info

Device tag (0011)

Serial number (0009)

Firmware version (0010)

Device name (0020)

Order code (0008)

→ 203

→ 203

→ 204

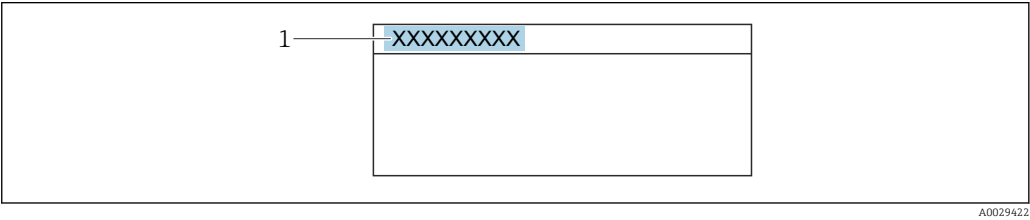
→ 204

→ 204

Ext. order cd. 1 (0023)	→ 205
Ext. order cd. 2 (0021)	→ 205
Ext. order cd. 3 (0022)	→ 205
Config. counter (2751)	→ 205
ENP version (0012)	→ 206

Device tag

Navigation	Expert → Diagnostics → Device info → Device tag (0011)
Description	Displays a unique name for the measuring point so it can be identified quickly within the plant. The name is displayed in the header.
User interface	Max. 32 characters such as lower-case letters or numbers.
Factory setting	Promass
Additional information	User interface



A0029422

1 Position of the header text on the display

The number of characters displayed depends on the characters used.

Serial number

Navigation	Expert → Diagnostics → Device info → Serial number (0009)
Description	Displays the serial number of the measuring device.  The number can be found on the nameplate of the sensor and transmitter.
User interface	A maximum of 11-digit character string comprising letters and numbers.

Additional information	<i>Description</i>  Uses of the serial number ■ To identify the measuring device quickly, e.g. when contacting Endress+Hauser. ■ To obtain specific information on the measuring device using the Device Viewer: www.endress.com/deviceviewer
Firmware version	
Navigation	 Expert → Diagnostics → Device info → Firmware version (0010)
Description	Displays the device firmware version installed.
User interface	Character string in the format xx.yy.zz
Additional information	<i>Display</i>  The Firmware version is also located: ■ On the title page of the Operating instructions ■ On the transmitter nameplate
Device name	
Navigation	 Expert → Diagnostics → Device info → Device name (0020)
Description	Displays the name of the transmitter. It can also be found on the nameplate of the transmitter.
User interface	Promass300/500
Order code	
Navigation	 Expert → Diagnostics → Device info → Order code (0008)
Description	Displays the device order code.
User interface	Character string composed of letters, numbers and certain punctuation marks (e.g. /).
Additional information	<i>Description</i>  The order code can be found on the nameplate of the sensor and transmitter in the "Order code" field. The order code is generated from the extended order code through a process of reversible transformation. The extended order code indicates the attributes for all the device features in the product structure. The device features are not directly readable from the order code.  Uses of the order code ■ To order an identical spare device. ■ To identify the device quickly and easily, e.g. when contacting Endress+Hauser.

Ext. order cd. 1

**Navigation** Expert → Diagnostics → Device info → Ext. order cd. 1 (0023)**Description**

Displays the first part of the extended order code.

On account of length restrictions, the extended order code is split into a maximum of 3 parameters.

User interface

Character string

Additional information*Description*

The extended order code indicates the version of all the features of the product structure for the measuring device and thus uniquely identifies the measuring device.



The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.

Ext. order cd. 2

**Navigation** Expert → Diagnostics → Device info → Ext. order cd. 2 (0021)**Description**

Displays the second part of the extended order code.

User interface

Character string

Additional information

For additional information, see **Ext. order cd. 1** parameter (→  205)

Ext. order cd. 3

**Navigation** Expert → Diagnostics → Device info → Ext. order cd. 3 (0022)**Description**

Displays the third part of the extended order code.

User interface

Character string

Additional information

For additional information, see **Ext. order cd. 1** parameter (→  205)

Config. counter

Navigation Expert → Diagnostics → Device info → Config. counter (2751)**Description**

Displays the number of parameter modifications for the device. When the user changes a parameter setting, this counter is incremented.

User interface

0 to 65 535

ENP version	
Navigation	  Expert → Diagnostics → Device info → ENP version (0012)
Description	Displays the version of the electronic nameplate.
User interface	Character string
Factory setting	2.02.00
Additional information	<i>Description</i> This electronic nameplate stores a data record for device identification that includes more data than the nameplates attached to the outside of the device.

3.8.4 "Mainboard module" submenu

Navigation   Expert → Diagnostics → Main elec.+I/O1

► Main elec.+I/O1

Software rev.

Build no. softw.

Bootloader rev.

→  206

→  206

→  207

Software rev.	
Navigation	  Expert → Diagnostics → Main elec.+I/O1 → Software rev. (0072)
Description	Use this function to display the software revision of the module.
User interface	Positive integer
Build no. softw.	
Navigation	  Expert → Diagnostics → Main elec.+I/O1 → Build no. softw. (0079)
Description	Displays the software build number of the module.
User interface	Positive integer

Bootloader rev.

Navigation	 Expert → Diagnostics → Main elec.+I/O1 → Bootloader rev. (0073)
Description	Displays the bootloader revision of the software.
User interface	Positive integer

3.8.5 "Sens. electronic" submenu

Navigation  Expert → Diagnostics → Sens. electronic

► Sens. electronic

Software rev. (0072)

Build no. softw. (0079)

Bootloader rev. (0073)

→  207

→  207

→  208

Software rev.

Navigation	 Expert → Diagnostics → Sens. electronic → Software rev. (0072)
Description	Use this function to display the software revision of the module.
User interface	Positive integer

Build no. softw.

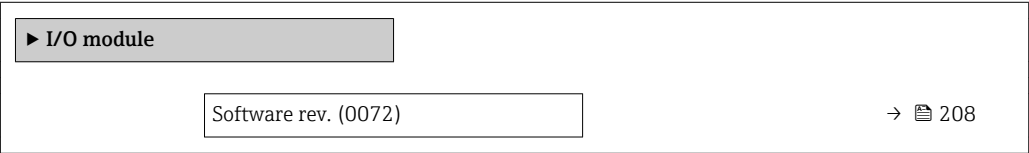
Navigation	 Expert → Diagnostics → Sens. electronic → Build no. softw. (0079)
Description	Displays the software build number of the module.
User interface	Positive integer

Bootloader rev.

Navigation	 Expert → Diagnostics → Sens. electronic → Bootloader rev. (0073)
Description	Displays the bootloader revision of the software.
User interface	Positive integer

3.8.6 "I/O module 1" submenu

Navigation Expert → Diagnostics → I/O module 1



I/O 1 terminals

Navigation	 Expert → Diagnostics → I/O module 1 → I/O 1 terminals (3902–1)
Description	Displays the terminal numbers used by the I/O module.
User interface	■ Not used ■ 26-27 (I/O 1) ■ 24-25 (I/O 2) ■ 22-23 (I/O 3)

Software rev.

Navigation	 Expert → Diagnostics → I/O module 2 → Software rev. (0072)  Expert → Diagnostics → I/O module 3 → Software rev. (0072)  Expert → Diagnostics → I/O module 4 → Software rev. (0072)
Description	Use this function to display the software revision of the module.
User interface	Positive integer

3.8.7 "I/O module 2" submenu

Navigation  Expert → Diagnostics → I/O module 2

► I/O module 2		
I/O 2 terminals	→ 	209
Software rev.	→ 	209
Build no. softw.	→ 	209
Bootloader rev.	→ 	210

I/O 1 terminals

Navigation	 Expert → Diagnostics → I/O module 1 → I/O 1 terminals (3902-1)
Description	Displays the terminal numbers used by the I/O module.
User interface	■ Not used ■ 26-27 (I/O 1) ■ 24-25 (I/O 2) ■ 22-23 (I/O 3)

Software rev.

Navigation	 Expert → Diagnostics → I/O module 2 → Software rev. (0072)
Description	Use this function to display the software revision of the module.
User interface	Positive integer

Build no. softw.

Navigation	 Expert → Diagnostics → I/O module 2 → Build no. softw. (0079)
Description	Displays the software build number of the module.
User interface	Positive integer

Bootloader rev.

Navigation	 Expert → Diagnostics → I/O module 2 → Bootloader rev. (0073)
Description	Displays the bootloader revision of the software.
User interface	Positive integer

3.8.8 "I/O module 3" submenu

Navigation

 Expert → Diagnostics → I/O module 3

► I/O module 3

I/O 3 terminals

→  210

Software rev.

→  210

Build no. softw.

→  211

Bootloader rev.

→  211

I/O 1 terminals

Navigation	 Expert → Diagnostics → I/O module 1 → I/O 1 terminals (3902–1)
Description	Displays the terminal numbers used by the I/O module.
User interface	■ Not used ■ 26-27 (I/O 1) ■ 24-25 (I/O 2) ■ 22-23 (I/O 3)

Software rev.

Navigation	 Expert → Diagnostics → I/O module 3 → Software rev. (0072)
Description	Use this function to display the software revision of the module.
User interface	Positive integer

Build no. softw.	
Navigation	  Expert → Diagnostics → I/O module 3 → Build no. softw. (0079)
Description	Displays the software build number of the module.
User interface	Positive integer

Bootloader rev.	
Navigation	  Expert → Diagnostics → I/O module 3 → Bootloader rev. (0073)
Description	Displays the bootloader revision of the software.
User interface	Positive integer

3.8.9 "Display module" submenu

Navigation   Expert → Diagnostics → Display module

► Display module

Software rev. (0072)

Build no. softw. (0079)

Bootloader rev. (0073)

→  211

→  212

→  212

Software rev.	
Navigation	  Expert → Diagnostics → Display module → Software rev. (0072)
Description	Use this function to display the software revision of the module.
User interface	Positive integer

Build no. softw.

Navigation	 Expert → Diagnostics → Display module → Build no. softw. (0079)
Description	Displays the software build number of the module.
User interface	Positive integer

Bootloader rev.

Navigation	 Expert → Diagnostics → Display module → Bootloader rev. (0073)
Description	Displays the bootloader revision of the software.
User interface	Positive integer

3.8.10 "Min/max val." submenu

Navigation  Expert → Diagnostics → Min/max val.

▶ Min/max val.		
Reset min/max (6151)		→  213
▶ Electronic temp.		→  213
▶ Medium temp.		→  214
▶ Carr. pipe temp.		→  215
▶ Oscil. frequency		→  216
▶ Tors.oscil.freq.		→  217
▶ Oscil. amplitude		→  218
▶ Tor. osc. amp.		→  219
▶ Oscil. damping		→  220
▶ Tors.oscil.damp.		→  220

► Signal asymmetry	→ 221
► Tors.sig.asymm.	→ 222

Reset min/max

Navigation	Expert → Diagnostics → Min/max val. → Reset min/max (6151)
Description	Use this function to select measured variables whose minimum, maximum and average measured values are to be reset.
Selection	■ Cancel ■ Oscil. amplitude ■ Osc. ampl. 1 * ■ Oscil. damping ■ Tors.oscil.damp. * ■ Oscil. frequency ■ Tors.oscil.freq. * ■ Signal asymmetry * ■ Tors.sig.asymm. *
Factory setting	Cancel
Additional information	Selection Detailed description of the options Oscil. frequency, Oscil. amplitude, Oscil. damping and Signal asymmetry: Value 1 display parameter (→ 18)

"Electronic temp." submenu

Navigation	Expert → Diagnostics → Min/max val. → Electronic temp.
► Electronic temp. Minimum value → 214 Maximum value → 214	

* Visibility depends on order options or device settings

Maximum value

Navigation	 Expert → Diagnostics → Min/max val. → Electronic temp. → Maximum value (6051)
Description	Displays the highest previously measured temperature value of the main electronics module.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Temperature unit parameter (→  69)

Minimum value

Navigation	 Expert → Diagnostics → Min/max val. → Electronic temp. → Minimum value (6052)
Description	Displays the lowest previously measured temperature value of the main electronics module.
User interface	Signed floating-point number
Additional information	<i>Dependency</i>  The unit is taken from the Temperature unit parameter (→  69)

"Medium temp." submenu

Navigation  Expert → Diagnostics → Min/max val. → Medium temp.

► Medium temp.

Minimum value (6109)

→  214

Maximum value (6108)

→  215

Minimum value

Navigation	 Expert → Diagnostics → Min/max val. → Medium temp. → Minimum value (6109)
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 (→  69)
Maximum value	
Navigation	 Expert → Diagnostics → Min/max val. → Medium temp. → Maximum value (6108)
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 (→  69)

"Carr. pipe temp." submenu

Navigation  Expert → Diagnostics → Min/max val. → Carr. pipe temp.

► Carr. pipe temp.

Minimum value (6030)

→  215

Maximum value (6029)

→  216

Minimum value

Navigation	 Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Minimum value (6030)
Prerequisite	 Only available for: ■ Promass A ■ Promass F ■ Promass H ■ Promass I ■ Promass O ■ Promass P ■ PromassQ ■ Promass S ■ Promass X For the following order code "Application package", option EB "Heartbeat Verification + Monitoring"
Description	Displays the lowest previously measured temperature value of the carrier pipe.

User interface Signed floating-point number

Additional information *Dependency*
 The unit is taken from the **Temperature unit** parameter (→  69)

Maximum value

Navigation   Expert → Diagnostics → Min/max val. → Carr. pipe temp. → Maximum value (6029)

Prerequisite  Only available for:

- Promass A
- Promass F
- Promass H
- Promass I
- Promass O
- Promass P
- PromassQ
- Promass S
- Promass X

For the following order code
"Application package", option **EB** "Heartbeat Verification + Monitoring"

Description Displays the highest previously measured temperature value of the carrier pipe.

User interface Signed floating-point number

Additional information *Dependency*
 The unit is taken from the **Temperature unit** parameter (→  69)

"Oscil. frequency" submenu

Navigation   Expert → Diagnostics → Min/max val. → Oscil. frequency

► Oscil. frequency

Minimum value (6071)

→  217

Maximum value (6070)

→  217

Minimum value	
Navigation	  Expert → Diagnostics → Min/max val. → Oscil. frequency → Minimum value (6071)
Description	Displays the lowest previously measured oscillation frequency.
User interface	Signed floating-point number

Navigation	  Expert → Diagnostics → Min/max val. → Oscil. frequency → Maximum value (6070)
Description	Displays the highest previously measured oscillation frequency.
User interface	Signed floating-point number

"Tors.oscil.freq." submenu

Navigation

  Expert → Diagnostics → Min/max val. → Tors.oscil.freq.

► Tors.oscil.freq.

Minimum value (6069)

→  217

Maximum value (6068)

→  218

Minimum value	
Navigation	  Expert → Diagnostics → Min/max val. → Tors.oscil.freq. → Minimum value (6069)
Prerequisite	 Only available for Promass I. For the following order code: "Application package", option EB "Heartbeat Verification + Monitoring"
Description	Displays the lowest previously measured torsion oscillation frequency.
User interface	Signed floating-point number

Maximum value

Navigation	 Expert → Diagnostics → Min/max val. → Tors.oscil.freq. → Maximum value (6068)
Prerequisite	 Only available for Promass I. For the following order code: "Application package", option EB "Heartbeat Verification + Monitoring"
Description	Displays the highest previously measured torsion oscillation frequency.
User interface	Signed floating-point number

"Oscil. amplitude" submenu

Navigation

 Expert → Diagnostics → Min/max val. → Oscil. amplitude

► Oscil. amplitude

Minimum value (6010)

→  218

Maximum value (6009)

→  218

Minimum value

Navigation	 Expert → Diagnostics → Min/max val. → Oscil. amplitude → Minimum value (6010)
Description	Displays the lowest previously measured oscillation amplitude.
User interface	Signed floating-point number

Maximum value

Navigation	 Expert → Diagnostics → Min/max val. → Oscil. amplitude → Maximum value (6009)
Description	Displays the highest previously measured oscillation amplitude.
User interface	Signed floating-point number

"Tor. osc. amp." submenu

Navigation  Expert → Diagnostics → Min/max val. → Tor. osc. amp.

Tor. osc. amp.

Minimum value (6008)

→  219

Maximum value (6007)

→  219

Minimum value

Navigation	 Expert → Diagnostics → Min/max val. → Tor. osc. amp. → Minimum value (6008)
Prerequisite	 Only available for Promass I. For the following order code: "Application package", option EB "Heartbeat Verification + Monitoring"
Description	Displays the lowest previously measured torsion oscillation amplitude.
User interface	Signed floating-point number

Maximum value

Navigation	 Expert → Diagnostics → Min/max val. → Tor. osc. amp. → Maximum value (6007)
Prerequisite	 Only available for Promass I. For the following order code: "Application package", option EB "Heartbeat Verification + Monitoring"
Description	Displays the highest previously measured torsion oscillation amplitude.
User interface	Signed floating-point number

"Oscil. damping" submenu

Navigation  Expert → Diagnostics → Min/max val. → Oscil. damping

► Oscil. damping

Minimum value (6122)

→  220

Maximum value (6121)

→  220

Minimum value

Navigation  Expert → Diagnostics → Min/max val. → Oscil. damping → Minimum value (6122)

Description Displays the lowest previously measured oscillation damping.

User interface Signed floating-point number

Maximum value

Navigation  Expert → Diagnostics → Min/max val. → Oscil. damping → Maximum value (6121)

Description Displays the highest previously measured oscillation damping.

User interface Signed floating-point number

"Tors.oscil.damp." submenu

Navigation  Expert → Diagnostics → Min/max val. → Tors.oscil.damp.

► Tors.oscil.damp.

Minimum value (6120)

→  221

Maximum value (6119)

→  221

Minimum value	
Navigation	 Expert → Diagnostics → Min/max val. → Tors.oscil.damp. → Minimum value (6120)
Prerequisite	 Only available for Promass I. For the following order code: "Application package", option EB "Heartbeat Verification + Monitoring"
Description	Displays the lowest previously measured torsion oscillation damping.
User interface	Signed floating-point number

Navigation	 Expert → Diagnostics → Min/max val. → Tors.oscil.damp. → Maximum value (6119)
Prerequisite	 Only available for Promass I. For the following order code: "Application package", option EB "Heartbeat Verification + Monitoring"
Description	Displays the highest previously measured torsion oscillation damping.
User interface	Signed floating-point number

"Signal asymmetry" submenu

Navigation

 Expert → Diagnostics → Min/max val. → Signal asymmetry

► Signal asymmetry

Minimum value (6015)

→  221

Maximum value (6014)

→  222

Minimum value	
Navigation	 Expert → Diagnostics → Min/max val. → Signal asymmetry → Minimum value (6015)
Description	Displays the lowest previously measured signal asymmetry.

User interface

Signed floating-point number

Maximum value

Navigation

 Expert → Diagnostics → Min/max val. → Signal asymmetry → Maximum value (6014)

Description

Displays the highest previously measured signal asymmetry.

User interface

Signed floating-point number

"Torsion signal asymmetry" submenu

Navigation

 Expert → Diagnostics → Min/max val. → Tors.sig.asymm.

► Tors.sig.asymm.

Minimum value (6284)

→  222

Maximum value (6283)

→  222

Minimum value

Navigation

 Expert → Diagnostics → Min/max val. → Tors.sig.asymm. → Minimum value (6284)

Prerequisite

 Only available for Promass I.

For the following order code:
"Application package", option **EB** "Heartbeat Verification + Monitoring"

Description

Displays the lowest previously measured torsion signal asymmetry.

User interface

Signed floating-point number

Maximum value

Navigation

 Expert → Diagnostics → Min/max val. → Tors.sig.asymm. → Maximum value (6283)

Prerequisite

 Only available for Promass I.

For the following order code:
"Application package", option **EB** "Heartbeat Verification + Monitoring"

Description	Displays the highest previously measured torsion signal asymmetry.
User interface	Signed floating-point number

3.8.11 "Data logging" submenu

Navigation  Expert → Diagnostics → Data logging

► Data logging		
Assign chan. 1	→ 	224
Assign chan. 2	→ 	225
Assign chan. 3	→ 	225
Assign chan. 4	→ 	226
Logging interval	→ 	226
Clear logging	→ 	227
Data logging	→ 	227
Logging delay	→ 	228
Data log.control	→ 	228
Data log. status	→ 	228
Logging duration	→ 	229
► Displ.channel 1	→ 	229
► Displ.channel 2	→ 	231
► Displ.channel 3	→ 	231
► Displ.channel 4	→ 	231

Assign chan. 1



Navigation

 Expert → Diagnostics → Data logging → Assign chan. 1 (0851)

Prerequisite

The **Extended HistoROM** application package is available.

 The software options currently enabled are displayed in the **SW option overv.** parameter (→  47).

Description

Use this function to select a process variable for the data logging channel.

Selection

- Off
- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Target vol. flow
- Carrier vol. fl.
- Targ.corr.vol.fl
- Carr.corr.vol.fl
- Density
- Ref.density
- Ref.dens.altern.
- GSV flow
- GSVa
- NSV flow
- NSVa
- S&W volume flow
- Water cut
- Oil density
- Water density
- Oil mass flow
- Water mass flow
- Oil volume flow
- Water vol. flow
- Oil corr.vol.fl.
- Water corr.v.fl. *
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Temperature
- Carr. pipe temp. *
- Electronic temp.
- Osc. freq. 0
- Osc. freq. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Oscil. amplitude *
- Osc. ampl. 1 *
- Freq. fluct. 0
- Osc. damping 0
- Osc. damping 1 *

* Visibility depends on order options or device settings

- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *
- HBSI
- Curr.output 1
- Curr.output 2 *
- Curr.output 3 *
- Pressure

Factory setting Off

Additional information *Description*

A total of 1000 measured values can be logged. This means:

- 1000 data points if 1 logging channel is used
- 500 data points if 2 logging channels are used
- 333 data points if 3 logging channels are used
- 250 data points if 4 logging channels are used

Once the maximum number of data points is reached, the oldest data points in the data log are cyclically overwritten in such a way that the last 1000, 500, 333 or 250 measured values are always in the log (ring memory principle).

 The log contents are cleared if the option selected is changed.

Assign chan. 2

Navigation  Expert → Diagnostics → Data logging → Assign chan. 2 (0852)

Prerequisite The **Extended HistoROM** application package is available.

 The software options currently enabled are displayed in the **SW option overv.** parameter (→  47).

Description Options for the assignment of a process variable to the data logging channel.

Selection Picklist, see **Assign channel 1** parameter (→  224)

Factory setting Off

Assign chan. 3

Navigation  Expert → Diagnostics → Data logging → Assign chan. 3 (0853)

Prerequisite The **Extended HistoROM** application package is available.

 The software options currently enabled are displayed in the **SW option overv.** parameter (→  47).

* Visibility depends on order options or device settings

Description Options for the assignment of a process variable to the data logging channel.

Selection Picklist, see **Assign channel 1** parameter (→  224)

Factory setting Off

Assign chan. 4

Navigation   Expert → Diagnostics → Data logging → Assign chan. 4 (0854)

Prerequisite The **Extended HistoROM** application package is available.

 The software options currently enabled are displayed in the **SW option overv.** parameter (→  47).

Description Options for the assignment of a process variable to the data logging channel.

Selection Picklist, see **Assign channel 1** parameter (→  224)

Factory setting Off

Logging interval

Navigation   Expert → Diagnostics → Data logging → Logging interval (0856)

Prerequisite The **Extended HistoROM** application package is available.

 The software options currently enabled are displayed in the **SW option overv.** parameter (→  47).

Description Use this function to enter the logging interval $T_{\log}$ for data logging.

User entry 0.1 to 3 600.0 s

Factory setting 1.0 s

Additional information *Description*

This defines the interval between the individual data points in the data log, and thus the maximum loggable process time $T_{\log}$:

- If 1 logging channel is used: $T_{\log} = 1000 \times t_{\log}$
- If 2 logging channels are used: $T_{\log} = 500 \times t_{\log}$
- If 3 logging channels are used: $T_{\log} = 333 \times t_{\log}$
- If 4 logging channels are used: $T_{\log} = 250 \times t_{\log}$

Once this time elapses, the oldest data points in the data log are cyclically overwritten such that a time of $T_{\log}$ always remains in the memory (ring memory principle).



The log contents are cleared if the length of the logging interval is changed.

Example

If 1 logging channel is used:

- $T_{\log} = 1000 \times 1 \text{ s} = 1\,000 \text{ s} \approx 15 \text{ min}$
- $T_{\log} = 1000 \times 10 \text{ s} = 10\,000 \text{ s} \approx 3 \text{ h}$
- $T_{\log} = 1000 \times 80 \text{ s} = 80\,000 \text{ s} \approx 1 \text{ d}$
- $T_{\log} = 1000 \times 3\,600 \text{ s} = 3\,600\,000 \text{ s} \approx 41 \text{ d}$

Clear logging



Navigation

Expert → Diagnostics → Data logging → Clear logging (0855)

Prerequisite

The **Extended HistoROM** application package is available.



The software options currently enabled are displayed in the **SW option overv.** parameter (→ 47).

Description

Use this function to clear the entire logging data.

Selection

- Cancel
- Clear data

Factory setting

Cancel

Additional information

Selection

- Cancel
The data is not cleared. All the data is retained.
- Clear data
The logging data is cleared. The logging process starts from the beginning.

Data logging



Navigation

Expert → Diagnostics → Data logging → Data logging (0860)

Description

Use this function to select the data logging method.

Selection

- Overwriting
- Not overwriting

Factory setting

Overwriting

Additional information

Selection

- Overwriting
The device memory applies the FIFO principle.
- Not overwriting
Data logging is canceled if the measured value memory is full (single shot).

Logging delay



Navigation	 Expert → Diagnostics → Data logging → Logging delay (0859)
Prerequisite	In the Data logging parameter (→  227), the Not overwriting option is selected.
Description	Use this function to enter the time delay for measured value logging.
User entry	0 to 999 h
Factory setting	0 h
Additional information	<i>Description</i> Once measured value logging has been started with the Data log.control parameter (→  228), the device does not save any data for the duration of the time delay entered.

Data log.control



Navigation	 Expert → Diagnostics → Data logging → Data log.control (0857)
Prerequisite	In the Data logging parameter (→  227), the Not overwriting option is selected.
Description	Use this function to start and stop measured value logging.
Selection	■ None ■ Delete + start ■ Stop
Factory setting	None
Additional information	<i>Selection</i> ■ None Initial measured value logging status. ■ Delete + start All the measured values recorded for all the channels are deleted and measured value logging starts again. ■ Stop Measured value logging is stopped.

Data log. status

Navigation	 Expert → Diagnostics → Data logging → Data log. status (0858)
Prerequisite	In the Data logging parameter (→  227), the Not overwriting option is selected.
Description	Displays the measured value logging status.

User interface	■ Done ■ Delay active ■ Active ■ Stopped
Factory setting	Done
Additional information	<i>Selection</i> ■ Done Measured value logging has been performed and completed successfully. ■ Delay active Measured value logging has been started but the logging interval has not yet elapsed. ■ Active The logging interval has elapsed and measured value logging is active. ■ Stopped Measured value logging is stopped.

Logging duration

Navigation	 Expert → Diagnostics → Data logging → Logging duration (0861)
Prerequisite	In the Data logging parameter (→  227), the Not overwriting option is selected.
Description	Displays the total logging duration.
User interface	Positive floating-point number
Factory setting	0 s

"Displ.channel 1" submenu

Navigation  Expert → Diagnostics → Data logging → Displ.channel 1



Display channel 1

Navigation	 Expert → Diagnostics → Data logging → Displ.channel 1
Prerequisite	The Extended HistoROM application package is available.  The software options currently enabled are displayed in the SW option overv. parameter (→  47).

One of the following options is selected in the **Assign chan. 1** parameter (→  224):

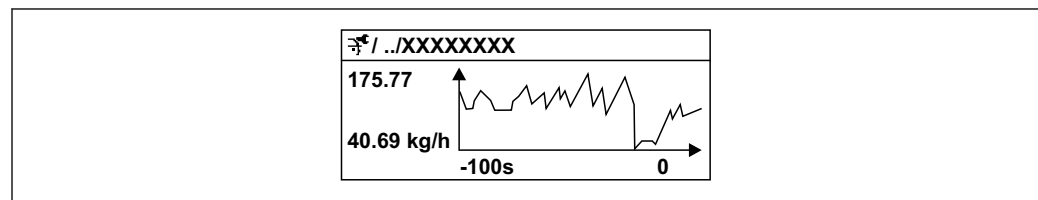
- Mass flow
- Volume flow
- Correct.vol.flow
- Target mass flow *
- Carrier mass fl. *
- Density
- Ref.density
- Concentration *
- Dynam. viscosity *
- Kinematic visc. *
- TempCompDynVisc *
- TempCompKinVisc *
- Carr. pipe temp. *
- Electronic temp.
- Curr.output 1
- Osc. freq. 0
- Osc. freq. 1 *
- Freq. fluct. 0
- Freq. fluct. 1 *
- Oscil. amplitude *
- Osc. ampl. 1 *
- Osc. damping 0
- Osc. damping 1 *
- Osc.damp.fluct 0
- Osc.damp.fluct 1 *
- Signal asymmetry
- Exc. current 0
- Exc. current 1 *

Description

Displays the measured value trend for the logging channel in the form of a chart.

Additional information

Description



A0016357

 9 Chart of a measured value trend

- x-axis: depending on the number of channels selected displays 250 to 1000 measured values of a process variable.
- y-axis: displays the approximate measured value span and constantly adapts this to the ongoing measurement.

* Visibility depends on order options or device settings

"Displ.channel 2" submenu

Navigation

 Expert → Diagnostics → Data logging → Displ.channel 2

► Displ.channel 2

Display channel 2 →  231

Display channel 2

- Navigation

 Expert → Diagnostics → Data logging → Displ.channel 2
- Prerequisite

A process variable is defined in the **Assign chan. 2** parameter.
- Description

See the **Display channel 1** parameter →  229

"Displ.channel 3" submenu

Navigation

 Expert → Diagnostics → Data logging → Displ.channel 3

► Displ.channel 3

Display channel 3 →  231

Display channel 3

- Navigation

 Expert → Diagnostics → Data logging → Displ.channel 3
- Prerequisite

A process variable is defined in the **Assign chan. 3** parameter.
- Description

See the **Display channel 1** parameter →  229

"Displ.channel 4" submenu

Navigation

 Expert → Diagnostics → Data logging → Displ.channel 4

► Displ.channel 4

Display channel 4 →  232

Display channel 4

Navigation	 Expert → Diagnostics → Data logging → Displ.channel 4
Prerequisite	A process variable is defined in the Assign chan. 4 parameter.
Description	See the Display channel 1 parameter →  229

3.8.12 "Heartbeat" submenu

 For detailed information on the parameter descriptions for the **Heartbeat Verification+Monitoring** application package, refer to the Special Documentation for the device →  7

Navigation  Expert → Diagnostics → Heartbeat

▶ Heartbeat

▶ Base settings

▶ Perform.verific.

▶ Verific. results

▶ HBT Monitoring

▶ Monitor. results

3.8.13 "Simulation" submenu

Navigation  Expert → Diagnostics → Simulation

▶ Simulation

Assign proc.var. (1810)

Proc. var. value (1811)

Status inp. sim. (1355)

Signal level (1356)

Curr.inp 1 to n sim. (1608-1 to n)

Value curr.inp 1 to n (1609-1 to n)

→  233

→  234

→  235

→  235

→  235

→  236

Curr.out. 1 to n sim. (0354-1 to n)	→  236
Value curr.out 1 to n (0355-1 to n)	→  237
FreqOutputSim 1 to n (0472-1 to n)	→  237
Freq value 1 to n (0473-1 to n)	→  237
Puls.outp.sim. 1 to n (0458-1 to n)	→  238
Pulse value 1 to n (0459-1 to n)	→  238
Switch sim. 1 to n (0462-1 to n)	→  239
Switch status 1 to n (0463-1 to n)	→  239
Relay out. 1 to n sim (0802-1 to n)	→  240
Switch status 1 to n (0803-1 to n)	→  240
Dev. alarm sim. (0654)	→  241
Event category (0738)	→  241
Diag. event sim. (0737)	→  241

Assign proc.var.**Navigation** Expert → Diagnostics → Simulation → Assign proc.var. (1810)**Description**

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

Selection

- Off
- Mass flow
- Volume flow
- Correct.vol.flow
- Target vol. flow
- Carrier vol. fl.
- Targ.corr.vol.fl
- Carr.corr.vol.fl
- Density
- Ref.density
- Ref.dens.altern.
- GSV flow
- GSVa
- NSV flow
- NSVa
- S&W volume flow

- Water cut
- Oil density
- Water density
- Oil mass flow
- Water mass flow
- Oil volume flow
- Water vol. flow
- Oil corr.vol.fl.
- Water corr.v.fl.
- Density average
- Temp. average
- Temperature
- Dynam. viscosity^{*}
- Kinematic visc.^{*}
- TempCompDynVisc^{*}
- TempCompKinVisc^{*}
- Concentration^{*}
- Target mass flow^{*}
- Carrier mass fl.^{*}

Factory setting Off

Additional information *Description*

 The simulation value of the process variable selected is defined in the **Proc. var. value** parameter (→  234).

Proc. var. value

Navigation   Expert → Diagnostics → Simulation → Proc. var. value (1811)

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 *Entry*

 The unit of the displayed measured value is taken from the **System units** submenu (→  63).

^{*} Visibility depends on order options or device settings

Status inp. sim.**Navigation** Expert → Diagnostics → Simulation → Status inp. sim. (1355)**Description**

Use this function to switch simulation of the status input on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting

Off

Additional information*Description*

The desired simulation value is defined in the **Signal level** parameter (→  235).

Selection

- Off
Simulation for the status input is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
Simulation for the status input is active.

Signal level**Navigation** Expert → Diagnostics → Simulation → Signal level (1356)**Prerequisite**

In the **Status inp. sim.** parameter (→  235), the **On** option is selected.

Description

Use this function to select the signal level for the simulation of the status input. In this way, users can verify the correct configuration of the status input and the correct function of upstream feed-in units.

Selection

- High
- Low

Curr.inp 1 to n sim.**Navigation** Expert → Diagnostics → Simulation → Curr.inp 1 to n sim. (1608–1 to n)**Description**

Option for switching simulation of the current input on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.



The desired simulation value is defined in the **Value curr.inp 1 to n** parameter.

Selection

- Off
- On

Factory setting Off

Additional information *Selection*

- Off
Current simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
Current simulation is active.

Value curr.inp 1 to n



Navigation Expert → Diagnostics → Simulation → Value curr.inp 1 to n (1609–1 to n)

Prerequisite In the **Curr.inp 1 to n sim.** parameter, the **On** option is selected.

Description Use this function to enter the current value for the simulation. In this way, users can verify the correct configuration of the current input and the correct function of upstream feed-in units.

User entry 0 to 22.5 mA

Curr.out. 1 to n sim.



Navigation Expert → Diagnostics → Simulation → Curr.out. 1 to n sim. (0354–1 to n)

Description Use this function to switch simulation of the current output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- On

Factory setting Off

Additional information *Description*

The desired simulation value is defined in the **Value curr.out 1 to n** parameter.

Selection

- Off
Current simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On
Current simulation is active.

Value curr.out 1 to n

Navigation	 Expert → Diagnostics → Simulation → Value curr.out 1 to n (0355–1 to n)
Prerequisite	In the Curr.out. 1 to n sim. parameter, the On option is selected.
Description	Use this function to enter a current value for the simulation. In this way, users can verify the correct adjustment of the current output and the correct function of downstream switching units.
User entry	3.59 to 22.5 mA
Additional information	<i>Dependency</i> The input range is dependent on the option selected in the Current span parameter (→  118).

FreqOutputSim 1 to n

Navigation	 Expert → Diagnostics → Simulation → FreqOutputSim 1 to n (0472–1 to n)
Prerequisite	In the Operating mode parameter (→  133), the Frequency option is selected.
Description	Use this function to switch simulation of the frequency output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.
Selection	■ Off ■ On
Factory setting	Off
Additional information	<i>Description</i>  The desired simulation value is defined in the Freq value 1 to n parameter. <i>Selection</i> ■ Off Frequency simulation is switched off. The device is in normal measuring mode or another process variable is being simulated. ■ On Frequency simulation is active.

Freq value 1 to n

Navigation	 Expert → Diagnostics → Simulation → Freq value 1 to n (0473–1 to n)
Prerequisite	In the FreqOutputSim 1 to n parameter, the On option is selected.

Description Use this function to enter a frequency value for the simulation. In this way, users can verify the correct adjustment of the frequency output and the correct function of downstream switching units.

User entry 0.0 to 12 500.0 Hz

Puls.outp.sim. 1 to n

Navigation   Expert → Diagnostics → Simulation → Puls.outp.sim. 1 to n (0458–1 to n)

Prerequisite In the **Operating mode** parameter (→  133), the **Pulse** option is selected.

Description Use this function to switch simulation of the pulse output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

Selection

- Off
- Fixed value
- Down-count. val.

Factory setting Off

Additional information *Description*

 The desired simulation value is defined in the **Pulse value 1 to n** parameter.

Selection

- Off
Pulse simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- Fixed value
Pulses are continuously output with the pulse width specified in the **Pulse width** parameter (→  136).
- Down-count. val.
The pulses specified in the **Pulse value** parameter (→  238) are output.

Pulse value 1 to n

Navigation   Expert → Diagnostics → Simulation → Pulse value 1 to n (0459–1 to n)

Prerequisite In the **Puls.outp.sim. 1 to n** parameter, the **Down-count. val.** option is selected.

Description Use this function to enter a pulse value for the simulation. In this way, users can verify the correct adjustment of the pulse output and the correct function of downstream switching units.

User entry 0 to 65 535

Switch sim. 1 to n		
Navigation	  Expert → Diagnostics → Simulation → Switch sim. 1 to n (0462–1 to n)	
Prerequisite	In the Operating mode parameter (→  133), the Switch option is selected.	
Description	Use this function to switch simulation of the switch output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.	
Selection	■ Off ■ On	
Factory setting	Off	
Additional information	<i>Description</i>  The desired simulation value is defined in the Switch status 1 to n parameter. <i>Selection</i> ■ Off Switch simulation is switched off. The device is in normal measuring mode or another process variable is being simulated. ■ On Switch simulation is active.	
Switch status 1 to n		
Navigation	  Expert → Diagnostics → Simulation → Switch status 1 to n (0463–1 to n)	
Description	Use this function to select a switch value for the simulation. In this way, users can verify the correct adjustment of the switch output and the correct function of downstream switching units.	
Selection	■ Open ■ Closed	
Additional information	<i>Selection</i> ■ Open Switch simulation is switched off. The device is in normal measuring mode or another process variable is being simulated. ■ Closed Switch simulation is active.	

Relay out. 1 to n sim

Navigation	 Expert → Diagnostics → Simulation → Relay out. 1 to n sim (0802–1 to n)
Description	Use this function to switch simulation of the relay output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.
Selection	■ Off ■ On
Factory setting	Off
Additional information	<i>Description</i>  The desired simulation value is defined in the Switch status 1 to n parameter. <i>Selection</i> ■ Off Relay simulation is switched off. The device is in normal measuring mode or another process variable is being simulated. ■ On Relay simulation is active.

Switch status 1 to n

Navigation	 Expert → Diagnostics → Simulation → Switch status 1 to n (0803–1 to n)
Prerequisite	The On option is selected in the Switch sim. 1 to n parameter parameter.
Description	Use this function to select a relay value for the simulation. In this way, users can verify the correct adjustment of the relay output and the correct function of downstream switching units.
Selection	■ Open ■ Closed
Additional information	<i>Selection</i> ■ Open Relay simulation is switched off. The device is in normal measuring mode or another process variable is being simulated. ■ Closed Relay simulation is active.

Dev. alarm sim.



Navigation	Expert → Diagnostics → Simulation → Dev. alarm sim. (0654)
Description	Use this function to switch the device alarm on and off.
Selection	■ Off ■ On
Factory setting	Off
Additional information	<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.

Event category



Navigation	Expert → Diagnostics → Simulation → Event category (0738)
Description	Use this function to select the category of the diagnostic events that are displayed for the simulation in the Diag. event sim. parameter (→ 241).
Selection	■ Sensor ■ Electronics ■ Configuration ■ Process
Factory setting	Process

Diag. event sim.



Navigation	Expert → Diagnostics → Simulation → Diag. event sim. (0737)
Description	Use this function to select a diagnostic event for the simulation process that is activated.
Selection	■ Off ■ Diagnostic event picklist (depends on the category selected)
Factory setting	Off
Additional information	<i>Description</i> For the simulation, you can choose from the diagnostic events of the category selected in the Event category parameter (→ 241).

4 Country-specific factory settings

4.1 SI units

 Not valid for USA and Canada.

4.1.1 System units

Mass	kg
Mass flow	kg/h
Volume	l
Volume flow	l/h
Corrected volume	Nl
Corrected volume flow	Nl/h
Density	kg/l
Reference density	kg/Nl
Temperature	°C
Pressure	bar a

4.1.2 Full scale values

 The factory settings apply to the following parameters:

- 20 mA value (full scale value of the current output)
- 100% bar graph value 1

Nominal diameter [mm]	[kg/h]
1	4
2	20
4	90
8	400
15	1 300
15 FB	3 600
25	3 600
25 FB	9 000
40	9 000
40 FB	14 000
50	14 000
50 FB	36 000
80	36 000
100	60 000
150	130 t/h
250	360 t/h
350	650 t/h

4.1.3 Output current span

Current output 1 to n	4 to 20 mA NAMUR
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4.1.4 Pulse value

Nominal diameter [mm]	[kg/p]
1	0.001
2	0.01
4	0.01
8	0.1
15	0.1
15 FB	1
25	1
25 FB	1
40	1
40 FB	10
50	10
50 FB	10
80	10
100	10
150	100
250	100
350	100

4.1.5 On value low flow cut off



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

Nominal diameter [mm]	On-value for liquid [kg/h]
1	0.08
2	0.4
4	1.8
8	8
15	26
15 FB	72
25	72
25 FB	180
40	180
40 FB	300
50	300
50 FB	720
80	720
100	1200

Nominal diameter [mm]	On-value for liquid [kg/h]
150	2.6 t/h
250	7.2 t/h
350	13 t/h

Nominal diameter [mm]	Switch-on value for gas [kg/h]
1	0.02
2	0.1
4	0.45
8	2
15	6.5
15 FB	18
25	18
25 FB	45
40	45
40 FB	75
50	75
50 FB	180
80	180
100	300
150	650
250	1.8 t/h
350	3.25 t/h

4.2 US units



Only valid for USA and Canada.

4.2.1 System units

Mass	lb
Mass flow	lb/min
Volume	gal (us)
Volume flow	gal/min (us)
Corrected volume	Sft ³
Corrected volume flow	Sft ³ /min
Density	lb/ft ³
Reference density	lb/Sft ³
Temperature	°F
Pressure	psi a

4.2.2 Full scale values



The factory settings apply to the following parameters:

- 20 mA value (full scale value of the current output)
- 100% bar graph value 1

Nominal diameter [in]	[lb/min]
$\frac{1}{24}$	0.15
$\frac{1}{12}$	0.75
$\frac{1}{8}$	3.3
$\frac{3}{8}$	15
$\frac{1}{2}$	50
$\frac{1}{2}$ FB	130
1	130
1 FB	330
$1\frac{1}{2}$	330
$1\frac{1}{2}$ FB	550
2	550
2 FB	1300
3	1300
4	2200
6	4800
10	13000
14	23500

4.2.3 Output current span

Current output 1 to n	4 to 20 mA US
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4.2.4 Pulse value

Nominal diameter [in]	[lb/p]
$\frac{1}{24}$	0.002
$\frac{1}{12}$	0.02
$\frac{1}{8}$	0.02
$\frac{3}{8}$	0.2
$\frac{1}{2}$	0.2
$\frac{1}{2}$ FB	2
1	2
1 FB	2
$1\frac{1}{2}$	2
$1\frac{1}{2}$ FB	20
2	20
2 FB	20
3	20

Nominal diameter [in]	[lb/p]
4	20
6	200
10	200
14	200

4.2.5 On value low flow cut off



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

Nominal diameter [in]	On-value for liquid [lb/min]
$\frac{1}{24}$	0.003
$\frac{1}{12}$	0.015
$\frac{1}{8}$	0.066
$\frac{3}{8}$	0.3
$\frac{1}{2}$	1
$\frac{1}{2}$ FB	2.6
1	2.6
1 FB	6.6
$1\frac{1}{2}$	6.6
$1\frac{1}{2}$ FB	11
2	11
2 FB	26
3	26
4	44
6	95
10	260
14	470

Nominal diameter [in]	Switch-on value for gas [lb/min]
$\frac{1}{24}$	0.001
$\frac{1}{12}$	0.004
$\frac{1}{8}$	0.016
$\frac{3}{8}$	0.075
$\frac{1}{2}$	0.25
$\frac{1}{2}$ FB	0.65
1	0.65
1 FB	1.65
$1\frac{1}{2}$	1.65
$1\frac{1}{2}$ FB	2.75
2	2.75
2 FB	6.5

Nominal diameter [in]	Switch-on value for gas [lb/min]
3	6.5
4	11
6	23.75
10	65
14	117.5

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).
Pressure	Pa a, kPa a, MPa a	Pascal, kilopascal, megapascal (absolute)
	bar	Bar
	Pa g, kPa g, MPa g	Pascal, kilopascal, megapascal (relative/gauge)
	bar g	Bar (relative/gauge)
Mass	g, kg, t	Gram, kilogram, metric ton
Mass flow	g/s, g/min, g/h, g/d	Gram/time unit
	kg/s, kg/min, kg/h, kg/d	Kilogram/time unit
	t/s, t/min, t/h, t/d	Metric ton/time unit
Ref.density	kg/Nm ³ , kg/Nl, g/Scm ³ , kg/Sm ³	Kilogram, gram/standard volume unit
Corrected volume	Nl, Nm ³ , Sm ³	Normal liter, normal cubic meter, standard cubic meter
Correct.vol.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

Process variable	Units	Explanation
Pressure	psi a	Pounds per square inch (absolute)
	psi g	Pounds per square inch (gauge)
Mass	oz, lb, STon	Ounce, pound, standard ton
Mass flow	oz/s, oz/min, oz/h, oz/d	Ounce/time unit
	lb/s, lb/min, lb/h, lb/d	Pound/time unit
	STon/s, STon/min, STon/h, STon/d	Standard ton/time unit
Ref.density	lb/Sft ³	Weight unit/standard volume unit
Corrected volume	Sft ³ , Sgal (us), Sbbl (us;liq.)	Standard cubic foot, standard gallon, standard barrel
Correct.vol.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
Correct.vol.flow	Sgal/s (imp), Sgal/min (imp), Sgal/h (imp), Sgal/d (imp)	Standard gallon/time unit
Volume	gal (imp), Mgal (imp)	Gallon, mega gallon
	bbl (imp;beer), bbl (imp;oil)	Barrel (beer), barrel (petrochemicals)
Volume flow	gal/s (imp), gal/min (imp), gal/h (imp), gal/d (imp)	Gallon/time unit
	Mgal/s (imp), Mgal/min (imp), Mgal/h (imp), Mgal/d (imp)	Mega gallon/time unit
	bbl/s (imp;beer), bbl/min (imp;beer), bbl/h (imp;beer), bbl/d (imp;beer)	Barrel /time unit (beer) Beer: 36.0 gal/bbl
	bbl/s (imp;oil), bbl/min (imp;oil), bbl/h (imp;oil), bbl/d (imp;oil)	Barrel/time unit (petrochemicals) Petrochemicals: 34.97 gal/bbl
Time	s, m, h, d, y	Second, minute, hour, day, year
	am, pm	Ante meridiem (before midday), post meridiem (after midday)

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