

Description of Device Parameters

Proline Promag 10

Electromagnetic flowmeter
HART

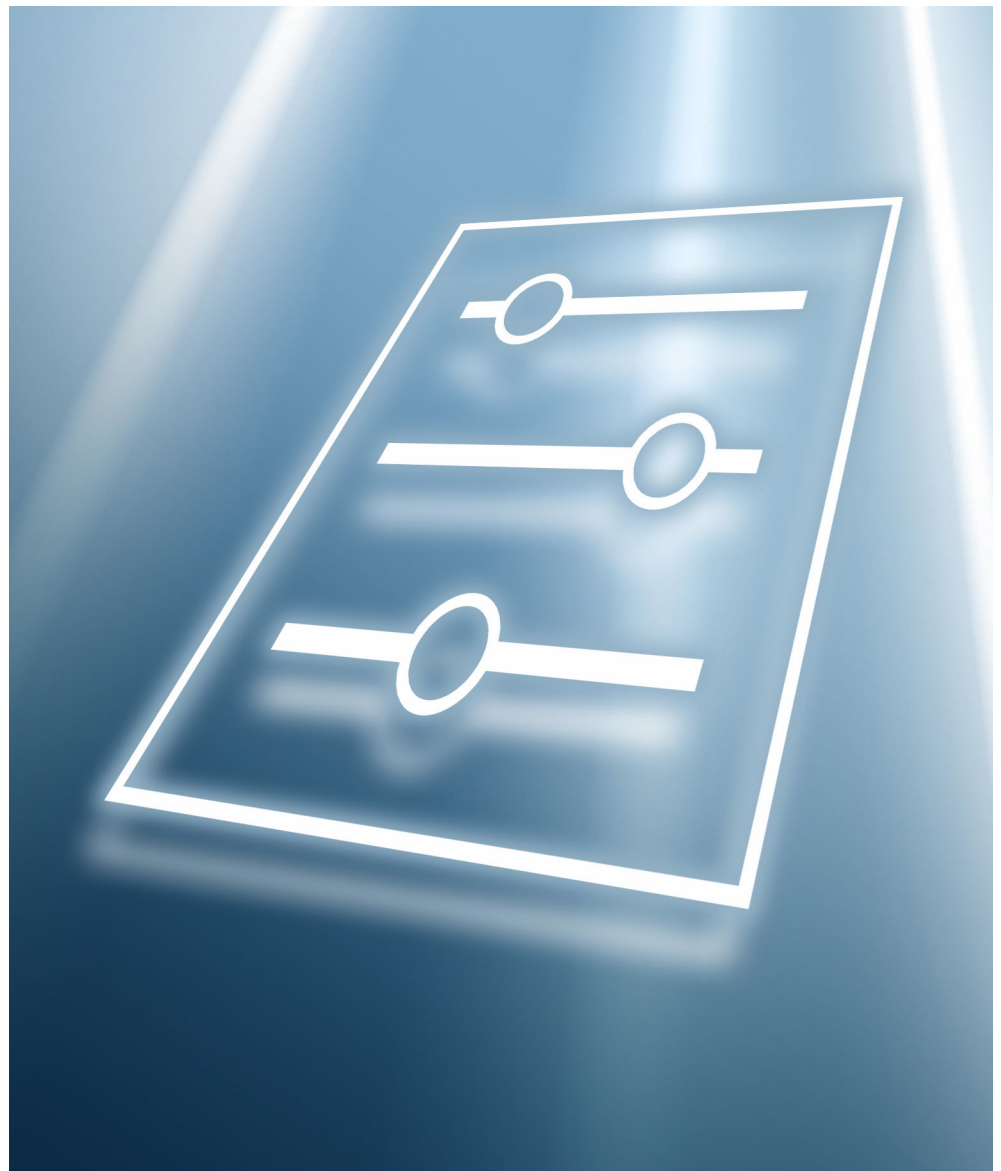


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1 About this document

1.1 Document function

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

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

- 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 Symbols

Types of information

-  Preferred procedures, processes or actions
-  Permitted procedures, processes or actions
-  Forbidden procedures, processes or actions
-  Additional information
-  Reference to documentation
-  Reference to page
-  Reference to graphic




1.3.2 Information on the document structure

The parameters of all the operating menus and the commissioning wizard are described in this document.

- **Guidance** menu with the **Commissioning** wizard (→  6), which guides the user automatically through all the device parameters that are required for commissioning
- **Application** menu (→  70)
- **Diagnostics** menu (→  41)
- **System** menu (→  131)

1.3.3 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 operating tool  The names of the menus, submenus and parameters are abbreviated to the form in which they appear on the display and in the operating tool.
Prerequisite	The parameter is only available under these specific conditions
Description	Description of the parameter function
Selection	List of the individual options for the parameter <ul style="list-style-type: none"> ▪ Option 1 ▪ Option 2
User entry	Input range for the parameter
User interface	Display value/data for the parameter
Additional information	Additional explanations (e.g. in examples): <ul style="list-style-type: none"> ▪ On individual options ▪ On display values/data ▪ On the input range ▪ On the parameter function

1.4 Associated documentation

Technical Information	Overview of the device with the most important technical data.
Operating Instructions	All the information that is required in the various phases of the life cycle of the device: from product identification, incoming acceptance and storage, to mounting, connection, operation and commissioning through to troubleshooting, maintenance and disposal as well as the technical data and dimensions.
Sensor Brief Operating Instructions	Incoming acceptance, transport, storage and mounting of the device.
Transmitter Brief Operating Instructions	Electrical connection and commissioning of the device.
Description of Parameters	Detailed explanation of the menus and parameters.
Safety Instructions	Documents for the use of the device in hazardous areas.
Special Documentation	Documents with more detailed information on specific topics.
Installation Instructions	Installation of spare parts and accessories.

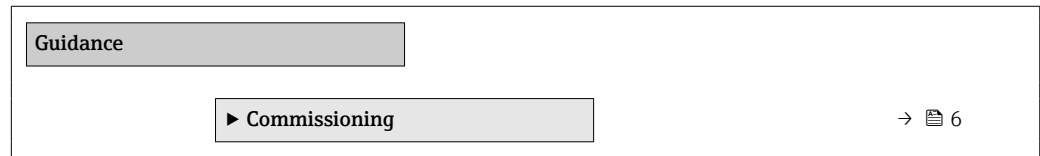
The related documentation is available online:

W@M Device Viewer	On the www.endress.com/deviceviewer website, enter the serial number of the device: nameplate
Endress+Hauser Operations App	<ul style="list-style-type: none"> ▶ Scan the Data Matrix code: nameplate ▶ Enter the serial number of the device: nameplate

2 "Guidance" menu

Main functions for use – from fast and safe commissioning to guided support during operation.

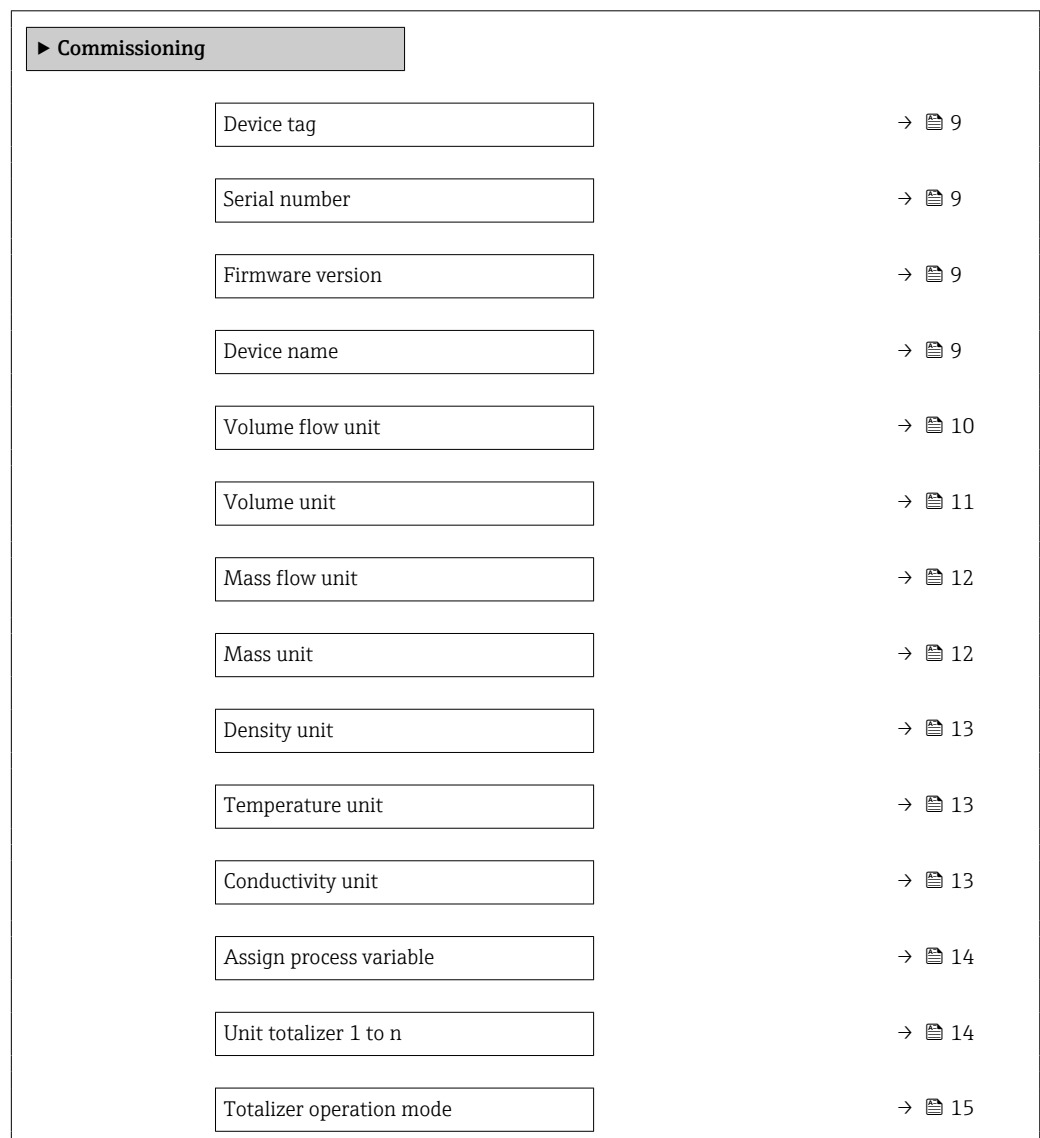
Navigation  Guidance
























2.1 "Commissioning" wizard

Complete this wizard to commission the device. NOTE: If you exit the wizard beforehand, the changes you made will be saved. For this reason, the device may be in an undefined state! In this case, reset the device to the default settings.

Navigation  Guidance → Commissioning








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2.1.1 Device identification

Navigation   Guidance → Commissioning

Device tag 	
Navigation	  Guidance → Commissioning → Device tag
Description	Enter a unique name for the measuring point to identify the device quickly within the plant.
User entry	Character string comprising numbers, letters and special characters (#32)
Serial number	
Navigation	  Guidance → Commissioning → Serial number
Description	Displays the serial number of the measuring device. The serial number can be used to identify the measuring device and to retrieve further information on the measuring device, such as the related documentation, via the Device Viewer or Operations app. Additional information: The serial number can also be found on the nameplate of the sensor and transmitter.
User interface	Character string comprising numbers, letters and special characters (#11)
Firmware version	
Navigation	  Guidance → Commissioning → Firmware version
Description	Displays the device firmware version installed.
User interface	Character string comprising numbers, letters and special characters (#8)
Device name	
Navigation	  Guidance → Commissioning → Device name
Description	Displays the name of the transmitter. Additional information: The name can also be found on the transmitter's nameplate.


User interface Character string comprising numbers, letters and special characters (#16)

2.1.2 System units

Navigation  Guidance → Commissioning

Volume flow unit



Navigation  Guidance → Commissioning → Volume flow unit

Description Select volume flow unit.

Selection	<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
	■ cm ³ /s	■ af/s	■ gal/s (imp)
	■ cm ³ /min	■ af/min	■ gal/min (imp)
	■ cm ³ /h	■ af/h	■ gal/h (imp)
	■ cm ³ /d	■ af/d	■ gal/d (imp)
	■ dm ³ /s	■ ft ³ /s	■ Mgal/s (imp)
	■ dm ³ /min	■ ft ³ /min	■ Mgal/min (imp)
	■ dm ³ /h	■ ft ³ /h	■ Mgal/h (imp)
	■ dm ³ /d	■ ft ³ /d	■ Mgal/d (imp)
	■ m ³ /s	■ MMft ³ /s	■ bbl/s (imp;beer)
	■ m ³ /min	■ MMft ³ /min	■ bbl/min (imp;beer)
	■ m ³ /h	■ MMft ³ /h	■ bbl/h (imp;beer)
	■ m ³ /d	■ Mft ³ /d	■ bbl/d (imp;beer)
	■ ml/s	■ fl oz/s (us)	■ bbl/s (imp;oil)
	■ ml/min	■ fl oz/min (us)	■ bbl/min (imp;oil)
	■ ml/h	■ fl oz/h (us)	■ bbl/h (imp;oil)
	■ ml/d	■ fl oz/d (us)	■ bbl/d (imp;oil)
	■ l/s	■ gal/s (us)	
	■ l/min	■ gal/min (us)	
	■ l/h	■ gal/h (us)	
	■ l/d	■ gal/d (us)	
	■ hl/s	■ Mgal/s (us)	
	■ hl/min	■ Mgal/min (us)	
	■ hl/h	■ Mgal/h (us)	
	■ hl/d	■ Mgal/d (us)	
	■ Ml/s	■ bbl/s (us;liq.)	
	■ Ml/min	■ bbl/min (us;liq.)	
	■ Ml/h	■ bbl/h (us;liq.)	
	■ Ml/d	■ bbl/d (us;liq.)	
		■ bbl/s (us;beer)	
		■ bbl/min (us;beer)	
		■ bbl/h (us;beer)	
		■ bbl/d (us;beer)	
		■ bbl/s (us;oil)	
		■ bbl/min (us;oil)	
		■ bbl/h (us;oil)	
		■ bbl/d (us;oil)	
		■ bbl/s (us;tank)	
		■ bbl/min (us;tank)	
		■ bbl/h (us;tank)	
		■ bbl/d (us;tank)	
		■ kgal/s (us)	
		■ kgal/min (us)	
		■ kgal/h (us)	
		■ kgal/d (us)	

Volume unit
**Navigation**

Guidance → Commissioning → Volume unit

Description

Select volume unit.

Selection	<i>SI units</i> <ul style="list-style-type: none"> ■ cm³ ■ dm³ ■ m³ ■ ml ■ l ■ hl ■ Ml Mega 	<i>US units</i> <ul style="list-style-type: none"> ■ af ■ ft³ ■ Mft³ ■ fl oz (us) ■ gal (us) ■ kgal (us) ■ Mgal (us) ■ bbl (us;oil) ■ bbl (us;liq.) ■ bbl (us;beer) ■ bbl (us;tank) 	<i>Imperial units</i> <ul style="list-style-type: none"> ■ gal (imp) ■ Mgal (imp) ■ bbl (imp;beer) ■ bbl (imp;oil)
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Mass flow unit



Navigation Guidance → Commissioning → Mass flow unit

Description Select mass flow unit.

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

Mass unit





Navigation Guidance → Commissioning → Mass unit

Description Select mass unit.

Selection	<i>SI units</i> <ul style="list-style-type: none"> ■ g ■ kg ■ t 	<i>US units</i> <ul style="list-style-type: none"> ■ oz ■ lb ■ STon
------------------	--------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------

Density unit




Navigation   Guidance → Commissioning → Density unit

Description Select density unit.

Selection

<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
▪ g/cm ³	▪ lb/ft ³	▪ lb/gal (imp)
▪ g/m ³	▪ lb/gal (us)	▪ lb/bbl (imp;beer)
▪ kg/l	▪ lb/bbl (us;liq.)	▪ lb/bbl (imp;oil)
▪ kg/dm ³	▪ lb/bbl (us;beer)	
▪ kg/m ³	▪ lb/bbl (us;oil)	
▪ SD4°C	▪ lb/bbl (us;tank)	
▪ SD15°C		
▪ SD20°C		
▪ SG4°C		
▪ SG15°C		
▪ SG20°C		

Temperature unit



Navigation   Guidance → Commissioning → Temperature unit

Prerequisite Temperature measurement is only optionally available for Promag H 10 (5HBB): Under order code for "Functionality", option D (extended transmitter) and order code for "Sensor option", option CI (medium temperature measurement)


Description Select temperature unit.


Selection

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

Conductivity unit


Navigation   Guidance → Commissioning → Conductiv. unit

Prerequisite Conductivity measurement is switched on in the **Conductivity measurement** parameter (→  85).

 Conductivity measurement is only optionally available: Under order code for "Functionality", option D (extended transmitter) and order code for "Sensor option", option CX (conductivity measurement)


Description Select conductivity unit.

- Selection**
- SI units*
- nS/cm
 - μS/cm
 - μS/m
 - μS/mm
 - mS/m
 - mS/cm
 - S/cm
 - S/m
 - kS/m
 - MS/m

2.1.3 Totalizer 1 to n

Navigation  Guidance → Commissioning

Assign process variable

Navigation  Guidance → Commissioning → Assign variable

Description Select process variable for totalizer.
 Additional information:
 If the option selected is changed, the device resets the totalizer to "0".

- Selection**
- Off
 - Volume flow
 - Mass flow

Unit totalizer 1 to n

Navigation  Guidance → Commissioning → Unit totalizer 1 to n

Prerequisite A process variable has been selected in the **Assign process variable** parameter in the **Totalizer 1 to n** submenu.

Description Select process variable totalizer unit.

- | | | |
|------------------|-------------------|---------------------|
| Selection | <i>SI units</i> | <i>US units</i> |
| | ■ g [*] | ■ oz [*] |
| | ■ kg [*] | ■ lb [*] |
| | ■ t [*] | ■ STon [*] |

* Visibility depends on order options or device settings

or

SI units

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

US units

- af *
- ft³ *
- Mft³ *
- fl oz (us) *
- gal (us) *
- kgal (us) *
- Mgal (us) *
- bbl (us;liq.) *
- bbl (us;beer) *
- bbl (us;oil) *
- bbl (us;tank) *

Imperial units

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

* Visibility depends on order options or device settings

or


Other units

None *


* Visibility depends on order options or device settings

Additional information

Description

The unit is selected separately for each totalizer. The unit is independent of the option selected in the **System units** submenu (→  74).

Selection

The selection is dependent on the process variable selected in the **Assign process variable** parameter (→  14).

Totalizer operation mode 

Navigation

  Guidance → Commissioning → Operation mode

Prerequisite

A process variable has been selected in the **Assign process variable** parameter in the **Totalizer 1 to n** submenu.

Description

Select totalizer calculation mode.

Selection



- Net flow total
- Forward flow total
- Reverse flow total

Additional information

Selection


- **Net flow total** option
The flow values in the forward and reverse flow directions are totalized and netted against each other. Net flow is recorded in the flow direction.
- **Forward flow total** option
Only the flow in the forward flow direction is totalized.
- **Reverse flow total** option
Only the flow in the reverse flow direction is totalized (= reverse flow quantity).



Failure mode 

Navigation	  Guidance → Commissioning → Failure mode
Prerequisite	A process variable has been selected in the Assign process variable parameter in the Totalizer 1 to n submenu.
Description	Specify how the totalizer should behave in the event of a device alarm. Additional information: The failsafe mode that applies to any other totalizers or outputs is specified separately in other parameters and is not impacted by this setting.
Selection	<ul style="list-style-type: none"> ■ Stop ■ Actual value ■ Last valid value
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Stop option The totalizer is stopped in the event of a device alarm. ■ Actual value option The totalizer continues to totalize based on the current value measured; the device alarm is ignored. ■ Last valid value option The totalizer continues to totalize based on the last valid value measured before the device alarm occurred.

2.1.4 Process parameters

Navigation   Guidance → Commissioning

Flow damping 

Navigation	  Guidance → Commissioning → Flow damping
Description	<p>Enter value for damping of the flow measured value in order to reduce the variability of the flow measured value when exposed to interference.</p> <p>Additional information: The depth of the flow filter is determined by this setting. As the filter depth increases, so does the reaction time of the device.</p> <ul style="list-style-type: none"> - Value = 0: No damping. Damping of 0 is not recommended, as the measuring signal is then so noisy that it is almost impossible to perform a measurement. - Value > 0: Damping increases <p>Optimal damping depends on the measuring period.</p> <p>Damping impacts the following measuring device variables:</p> <ul style="list-style-type: none"> - Outputs - Low flow cut off - Totalizers

User entry 0 to 15

2.1.5 Measuring conditions

Pressure shock suppression

Navigation  Guidance → Commissioning

Pressure shock suppression

Navigation  Guidance → Commissioning → Pres. shock sup.

Description Enter time frame for signal suppression (= pressure shock suppression active), for example to prevent the device from registering flow movements in the pipe when a valve is closed.

Additional information:

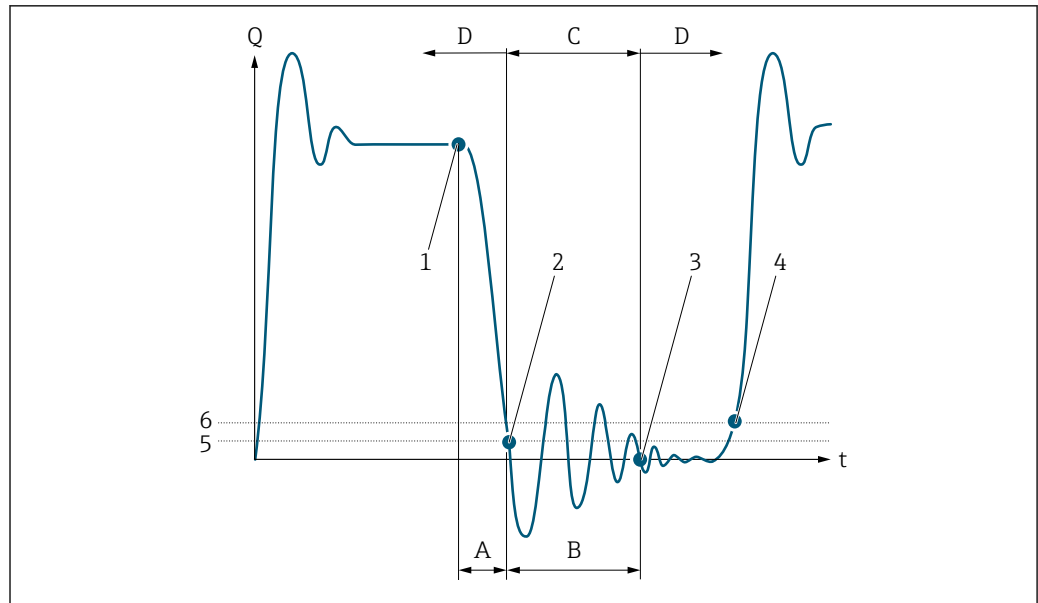
Pressure shock suppression is activated when the flow rate drops below the on value for low flow cutoff. Output values when pressure shock suppression is active:

- Flow: 0
 - Totalizer: Last valid value
- Pressure shock suppression is deactivated when:
- The time frame specified has elapsed and
 - Flow exceeds the off value for low flow cutoff

User entry 0 to 100 s

Additional information *Example*

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




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- Q* Flow
- t* Time
- A* After run
- 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

Low flow cut off

Navigation  Guidance → Commissioning

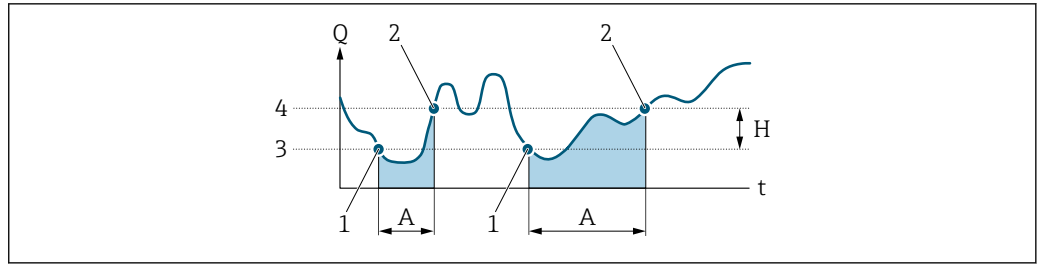
Low flow cut off

Navigation  Guidance → Commissioning → Low flow cut off

Description Select process variable for low flow cut off to activate low flow cut off.

- Selection
- Off
 - Volume flow
 - Mass flow

Additional information Description



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

On value low flow cutoff



Navigation Guidance → Commissioning → On value

Description Enter on value to switch on low flow cut off.
 Value = 0: No low flow cut off
 Value > 0: Low flow cut off is activated

User entry Positive floating-point number

Off value low flow cutoff



Navigation Guidance → Commissioning → Off value


Description Enter off value to switch off low flow cut off. The off value is entered as a positive hysteresis with respect to the on value.

User entry 0 to 100.0 %

Empty pipe detection

Navigation  Guidance → Commissioning

Empty pipe detection**Navigation**

 Guidance → Commissioning → Empty pipe det.

Description

Switch empty pipe detection on or off. Switch on empty pipe detection to detect a partially filled or empty measuring tube.

Selection

- Off
- On

Empty pipe adjust value**Navigation**

 Guidance → Commissioning → Empty pipe value

Description

Displays adjustment value when the measuring tube is empty.

NOTE

Users logged on in the Service role have write access!

User interface

Positive floating-point number

Full pipe adjust value**Navigation**

 Guidance → Commissioning → Full pipe value

Description

Displays adjustment value when the measuring tube is full.

NOTE

Users logged on in the Service role have write access!



User interface

Positive floating-point number

2.1.6 Current output

Navigation   Guidance → Commissioning

Process variable current output



Navigation   Guidance → Commissioning → Proc.var. outp

Description Select process variable for current output

Selection

- Off *
- Mass flow
- Conductivity *
- Corrected conductivity *
- Volume flow
- Temperature *
- Noise *
- Coil current shot time *

Current range output

Navigation   Guidance → Commissioning → Curr.range out

Description Select the current range for the measured value output and the upper and lower fault condition signal level.

Additional information:

- The measured value range is specified in the "Lower range value output " parameter and the "Upper range value output " parameter.
- If the measured value lies outside the scaled measured value range, diagnostic message "441 Current output faulty" is generated.
- In the event of a device alarm, the current output adopts the behavior specified in the "Failure behavior current output " parameter.

Selection

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

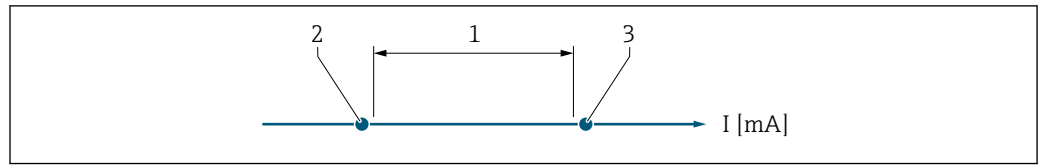
Additional information *Selection*

- **4...20 mA NE (3.8...20.5 mA)** option
Select this option to set the current range in accordance with NAMUR recommendation NE43.
- **Fixed value** option
Select this option to set the current output to a current value instead of a range.

The current value is defined in the **Fixed current** parameter (→  24).

* Visibility depends on order options or device settings

The graphic shows the relationship between the current range for the output of the process value and the lower and upper alarm levels:



A0034351

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

Selection (current range for process value)	Lower level for signal on alarm	Upper level for signal on alarm
4...20 mA NE (3.8...20.5 mA)	< 3.6 mA	> 21.5 mA
4...20 mA US (3.9...20.8 mA)		
4...20 mA (4... 20.5 mA)		

Lower range value output



Navigation

Guidance → Commissioning → Low.range outp

Prerequisite

In the **Current range output** parameter, one of the following options is selected:

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

Description

Enter lower range value for the measured value range.

Additional information:

- Depending on the setting selected for the "Measuring mode current output" parameter, the value specified for this parameter and the "Upper range value output" parameter must have the same algebraic sign or not.
- As a rule, the lower range value is scaled to be lower than the upper range value. As a result, the behavior of the current output is proportional to the process variable assigned. If the lower range value is scaled to be higher than the upper range value, then the behavior of the current output will be inversely proportional to the process variable assigned.

User entry

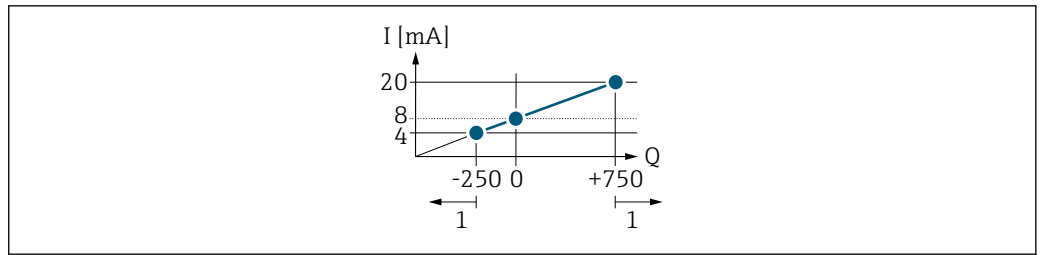
Signed floating-point number

Additional information

Examples of the behavior, depending on the option selected in the **Measuring mode current output** parameter (→ 96).

Example: Measuring mode with "Forward flow" option

- **Lower range value output** parameter (→ 22) = not equal to zero flow (e.g. -250 m3/h)
- **Upper range value output** parameter (→ 23) = not equal to zero flow (e.g. +750 m3/h)
- Calculated current value = 8 mA at zero flow

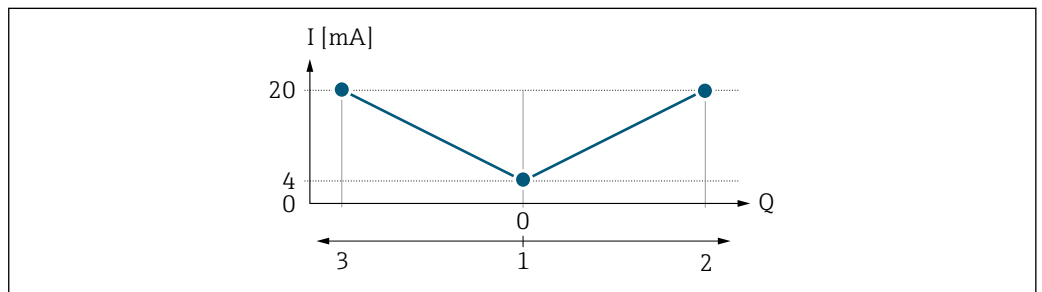


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- Q Flow
- I Current
- 1 Measuring range is exceeded or undershot

The linear operational range of the measuring device is defined by the values entered for the **Lower range value output** parameter (→ 22) and **Upper range value output** parameter (→ 23), and by the selected current range.

Example: Measuring mode with the "Forward/Reverse flow" option



A0013758

- Q Flow
- I Current
- 1 Value assigned to 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 **Lower range value output** parameter (→ 22) and **Upper range value output** parameter (→ 23) must have the same algebraic sign.

The value for the **Upper range value output** parameter (→ 23) (e.g. reverse flow) corresponds to the mirrored value for the **Upper range value output** parameter (→ 23) (e.g. forward flow).

Example: Measuring mode with the "Reverse flow compensation" option

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

Upper range value output



Navigation

☰☰ Guidance → Commissioning → Upp.range outp



Prerequisite

In the **Current range output** parameter, one of the following options is selected:



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

Description Enter upper range value for the measured value range.

User entry Signed floating-point number

Additional information  Examples of the behavior, depending on the option selected in the **Measuring mode current output** parameter: **Lower range value output** parameter (→  22):

Damping current output

Navigation   Guidance → Commissioning → Damp.curr.outp

Prerequisite A process variable is selected in the **Process variable current output** parameter and one of the following options is selected in the **Current range output** parameter:

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

Description Enter time constant (PT1 element) to set the reaction time of the output signal to fluctuations in the measured value caused by process conditions.

Additional information:

- The smaller the time constant the faster the output reacts to fluctuations in the measured value.
- If the time constant is 0, damping is deactivated.

User entry 0.0 to 999.9 s

Fixed current



Navigation   Guidance → Commissioning → Fixed current

Prerequisite In the **Current range output** parameter in the **Current output 1** submenu, the **Fixed value** option is selected.

Description Enter the value for the "Fixed value" option.

User entry 3.59 to 21.5 mA

Failure behavior current output

Navigation   Guidance → Commissioning → Fail.behav.out

Prerequisite A process variable is selected in the **Process variable current output** parameter and one of the following options is selected in the **Current range output** parameter:

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

Description	Specify how the output should behave in the event of a device alarm.
Selection	<ul style="list-style-type: none"> ■ Min. ■ Max. ■ Last valid value ■ Actual value ■ Fixed value
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Min. option The current output outputs the lower fault condition signal level for the specified current range. Additional information: The current range is specified in the "Current range output " parameter. ■ Max. option The current output outputs the upper fault condition signal level for the specified current range. Additional information: The current range is specified in the "Current range output " parameter. ■ Last valid value option The current output outputs the last valid value measured before the device alarm occurred. ■ Actual value option The current output outputs the flow value currently measured. The device alarm is ignored. ■ Fixed value option The current output outputs the value specified. Additional information: The value is specified in the "Failure current " parameter.

Failure current




Navigation	Guidance → Commissioning → Fail. current
Prerequisite	In the Failure behavior current output parameter in the Current output 1 submenu, the Fixed value option is selected.
Description	Enter the value for the "Fixed value" option in the "Failure behavior current output " parameter.
User entry	3.59 to 21.5 mA

2.1.7 Pulse/frequency/switch output

Navigation  Guidance → Commissioning

Operating mode

Navigation

 Guidance → Commissioning → Operating mode

Description

Select the operating mode for the output.

Selection

- Pulse
- Frequency
- Switch

Additional information

Selection

■ **Pulse** option

Quantitatively proportional pulse with pulse width to be configured. Whenever the pulse value for the specified process variable has been reached, a pulse is emitted, the duration of which is set within the "Pulse width" parameter.

Additional information:

The process variable for the pulse output is specified in the "Assign pulse output" parameter.

■ **Frequency** option

The output frequency is proportional to the value for the process variable assigned, with a pulse-to-interval ratio of 1:1.

Additional information:

The process variable for the frequency output is specified in the "Assign frequency output" parameter.

■ **Switch** option

Indicates when the state of the device changes, e.g. when a specified limit value is reached or an alarm or warning is triggered.

Additional information:

- The switch output can be in one of two states: either it is conductive or it is non-conductive.

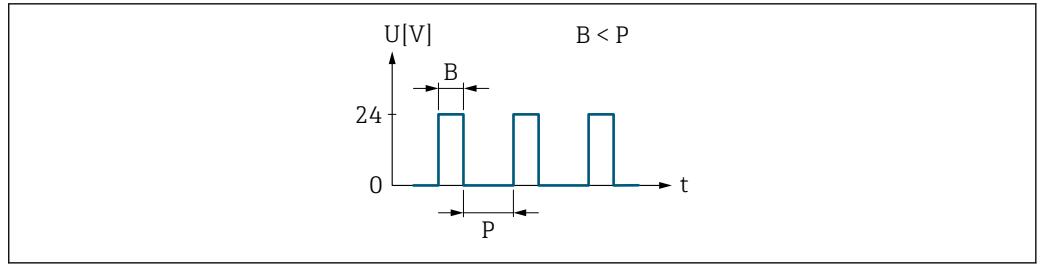
- When the function assigned to the switch output is triggered, the switch output will depending on the output configuration either be continuously conductive or continuously non-conductive.

- The switch output is used to display diagnostic information at the system level, e.g. by connecting a lamp that lights up when the function assigned is triggered.

"Pulse" option

Example

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



A0026883

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

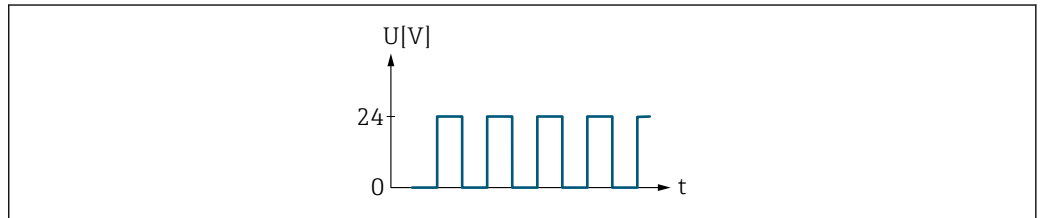
B Pulse width entered

P Pauses between the individual pulses

"Frequency" option

Example

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



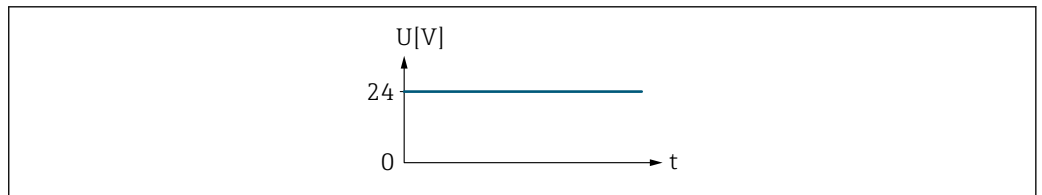
A0026886

2 Flow-proportional frequency output

"Switch" option

Example

Alarm response without alarm

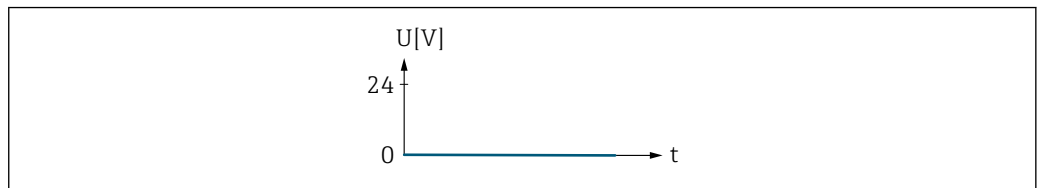


A0026884

3 No alarm, high level

Example

Alarm response in case of alarm



A0026885


4 Alarm, low level

Frequency output

Navigation  Guidance → Commissioning

Assign frequency output

Navigation

 Guidance → Commissioning → Assign freq.

Prerequisite

In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Frequency** option is selected.

Description

Select process variable for frequency output.

Selection

- Off
- Volume flow
- Mass flow
- Conductivity *
- Corrected conductivity *
- Temperature *
- Noise *
- Coil current shot time *

Minimum frequency value

Navigation

 Guidance → Commissioning → Min. freq. value

Prerequisite

In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Frequency** option is selected.

Description

Enter the minimum frequency for the frequency range.

Additional information:

The lower range value for the measured value range is specified in the "Measuring value at minimum frequency" parameter.

User entry

0.0 to 10 000.0 Hz

Measuring value at minimum frequency

Navigation

 Guidance → Commissioning → Val. at min.freq

Prerequisite

In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Frequency** option is selected.

* Visibility depends on order options or device settings

Description Enter lower range value for the measured value range.

Additional information:

- Depending on the setting selected for the "Measuring mode" parameter, the value specified for this parameter and the "Measuring value at maximum frequency" parameter must have the same algebraic sign or not.
- As a rule, the lower range value is scaled to be lower than the upper range value. As a result, the behavior of the frequency output is proportional to the process variable assigned. If the lower range value is scaled to be higher than the upper range value, then the behavior of the frequency output will be inversely proportional to the process variable assigned.

User entry Signed floating-point number

Maximum frequency value

Navigation   Guidance → Commissioning → Max. freq. value

Prerequisite In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Frequency** option is selected.

Description Enter the maximum frequency for the measured value output.

Additional information:
The upper range value for the measured value range that corresponds to the maximum frequency is specified in the "Measuring value at maximum frequency" parameter.

User entry 0.0 to 10 000.0 Hz

Measuring value at maximum frequency

Navigation   Guidance → Commissioning → Val. at max.freq

Prerequisite In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Frequency** option is selected.

Description Enter upper range value for the measured value range.

User entry Signed floating-point number

Failure mode

Navigation   Guidance → Commissioning → Failure mode

Prerequisite In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Frequency** option is selected.

Description Specify how the output should behave in the event of a device alarm.
Additional information:
For safety reasons, it is recommended that the behavior of the output in the event of a device alarm be predefined.


Selection

- Actual value
- Defined value
- 0 Hz

Additional information *Selection*

- **Actual value** option
The frequency output outputs the flow value currently measured.
- **Defined value** option
The frequency output outputs the value specified.
Additional information:
The value is specified in the "Failure frequency" parameter.
- **0 Hz** option
In the event of a device alarm, the frequency output outputs 0 Hz.

Failure frequency

Navigation   Guidance → Commissioning → Failure freq.

Prerequisite In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Frequency** option is selected.



Description Enter the value for the "Defined value" option in the "Failure mode" parameter.

User entry 0.0 to 12 500.0 Hz

Pulse output

Navigation   Guidance → Commissioning

Assign pulse output 1

Navigation   Guidance → Commissioning → Assign pulse 1

Prerequisite In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Pulse** option is selected.

Description Select process variable for pulse output.

Selection

- Off
- Volume flow
- Mass flow

Pulse width



Navigation

Guidance → Commissioning → Pulse width

Prerequisite

In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Pulse** option is selected.

Description

Specify the duration of the output pulse.

Additional information:

The maximum pulse rate is defined by $f_{max} = 1 / (2 \times \text{pulse width})$. The interval between two pulses (P) is at least as long as the specified pulse width (B).

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 "443 Pulse output faulty".

Example:

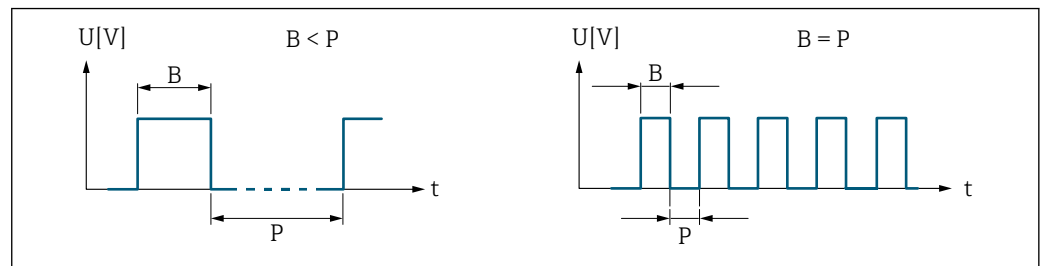
- Pulse value: 0.1 g
- Pulse width: 0.1 ms
- $f_{max}: 1 / (2 \times 0.1 \text{ ms}) = 5 \text{ kHz}$
- $Q_{max}: 5 \text{ kHz} \times 0.1 \text{ g} = 0.5 \text{ kg/s}$

User entry

0.05 to 2 000 ms

Additional information

Description



A0026882

- B* Pulse width entered
- P* Pauses between the individual pulses

Value per pulse



Navigation

Guidance → Commissioning → Value per pulse

Prerequisite

In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Pulse** option is selected.

Description

Enter the measured value to which a pulse corresponds.

Additional information:

Weighting of the pulse output with a quantity.

The lower the pulse value, the


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

User entry Signed floating-point number

Switch output

Navigation  Guidance → Commissioning

Switch output function

Navigation  Guidance → Commissioning → Switch out funct

Prerequisite In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Switch** option is selected.

Description Assign a function to the switch output.
 Additional information:
 - The state of the switch output (on or off) when the assigned function is triggered can be inverted in the "Invert output signal" parameter
 - The "Invert output signal" parameter is not available for all devices.

Selection

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

Additional information *Selection*

- **Off** option
The switch output is permanently switched off (open, non-conductive).
- **On** option
The switch output is permanently switched on (closed, conductive).
- **Diagnostic behavior** option
The switch output is switched on (closed, conductive), if there is a pending diagnostic event of the assigned behavioral category.
- **Limit** option
The switch output is switched on (closed, conductive), if a limit value specified for the process variable is reached.
- **Flow direction check** option
The switch output is switched on (closed, conductive), when the flow direction changes (forward or reverse flow).
- **Status** option
The switch output is switched on (closed, conductive) to indicate the device status for the selected detection method, e.g. empty pipe detection or low flow cut off.

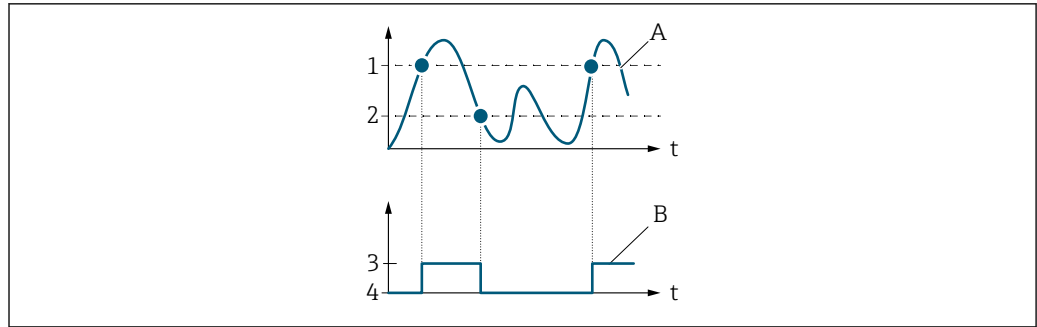
Assign diagnostic behavior


Navigation	Guidance → Commissioning → Assign diag. beh
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Switch option is selected.
Description	The switch output is switched on (closed, conductive), if there is a pending diagnostic event of the assigned behavioral category.
Selection	<ul style="list-style-type: none"> ■ Alarm ■ Alarm or warning ■ Warning
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Alarm option The switch output is only switched on for diagnostic events of the "Alarm" category. ■ Alarm or warning option The switch output is switched on for diagnostic events of the "Alarm" or "Warning" category. ■ Warning option The switch output is only switched on for diagnostic events of the "Warning" category.

Assign limit


Navigation	Guidance → Commissioning → Assign limit
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Switch option is selected.
Description	Select the process variable to monitor in case the specified limit value is exceeded. If a limit value for the selected process variable is exceeded, the output is switched on.
Selection	<ul style="list-style-type: none"> ■ Off ■ Volume flow ■ Mass flow ■ Flow velocity ■ Conductivity * ■ Corrected conductivity * ■ Totalizer 1 ■ Totalizer 2 ■ Totalizer 3 ■ Temperature * ■ Sensor electronics temperature (ISEM)
Additional information	<p><i>Switch-on point > switch-off point</i></p> <p>Behavior of the status output if switch-on point > switch-off point:</p> <ul style="list-style-type: none"> ■ Process variable > switch-on point: transistor is conductive ■ Process variable < switch-off point: transistor is not conductive

* Visibility depends on order options or device settings



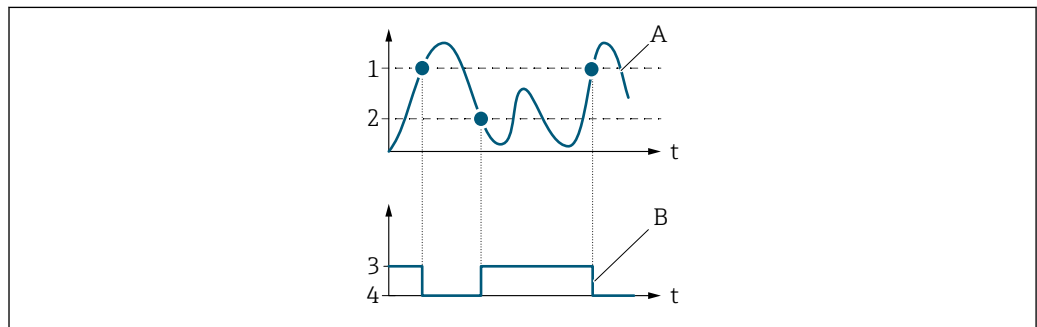
A0026891

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

Switch-on point < switch-off point

Behavior of the status output if switch-on point < switch-off point:

- Process variable < switch-on point: transistor is conductive
- Process variable > switch-off point: transistor is not conductive



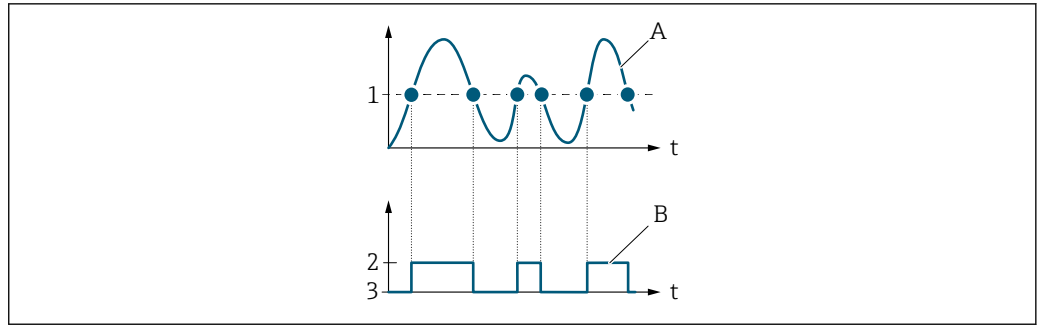
A0026892

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

Switch-on point = switch-off point

Behavior of the status output if switch-on point = switch-off point:

- Process variable > switch-on point: transistor is conductive
- Process variable < switch-off point: transistor is not conductive



A0026893

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

Switch-on value



Navigation

Guidance → Commissioning → Switch-on value

Prerequisite

In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Switch** option is selected.

Description

Enter limit value for the switch-on point (process variable > switch-on value = closed, conductive).

Additional information:

To use a hysteresis: Switch-on point > Switch-off point.

User entry

Signed floating-point number

Switch-off value



Navigation

Guidance → Commissioning → Switch-off value

Prerequisite

In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Switch** option is selected.

Description

Enter limit value for the switch-off point (process variable < switch-off value = open, non-conductive).



Additional information:

To use a hysteresis: Switch-on point > Switch-off point.



User entry

Signed floating-point number



Switch-on delay 


Navigation	  Guidance → Commissioning → Switch-on delay
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Switch option is selected.
Description	Enter delay before the switch output is switched on.
User entry	0.0 to 100.0 s



Switch-off delay 

Navigation	  Guidance → Commissioning → Switch-off delay
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Switch option is selected.
Description	Enter delay before the switch output is switched off.
User entry	0.0 to 100.0 s

Assign status 

Navigation	  Guidance → Commissioning → Assign status
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Switch option is selected.
Description	Select the device status to display for the switch output. Additional information: If the switch on point for the selected detection method is reached, the output is conductive. Otherwise, the switch output is non-conductive.
Selection	<ul style="list-style-type: none"> ■ Empty pipe detection ■ Low flow cut off

Failure mode 


Navigation	  Guidance → Commissioning → Failure mode
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Switch option is selected.

Description	Specify how the output should behave in the event of a device alarm. Additional information: For safety reasons, it is recommended that the behavior of the output in the event of a device alarm be predefined.
Selection	<ul style="list-style-type: none"> ■ Actual status ■ Open ■ Closed
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Actual status option In the event of a device alarm, the issue is ignored and the switch output adopts the behavior currently specified for the "Switch output function" parameter. ■ Open option In the event of a device alarm, the switch output's transistor is set to "non-conductive".

2.1.8 Display

Navigation  Guidance → Commissioning

Value 1 display

Navigation	 Guidance → Commissioning → Value 1 display
Description	Select the measured value that is displayed first on the local display. Additional information: The applicable unit of measure is specified in the "System units" submenu.
Selection	<ul style="list-style-type: none"> ■ Volume flow ■ Mass flow ■ Conductivity * ■ Corrected conductivity * ■ Temperature * ■ Totalizer 1 ■ Totalizer 2 ■ Totalizer 3

* Visibility depends on order options or device settings

Value 2 display**Navigation**

Guidance → Commissioning → Value 2 display

Description

Select the measured value that is shown second on the local display.

Additional information:

The applicable unit of measure is specified in the "System units" submenu.

Selection

- None
- Volume flow
- Mass flow
- Conductivity *
- Corrected conductivity *
- Temperature *
- Totalizer 1
- Totalizer 2
- Totalizer 3

Value 3 display**Navigation**

Guidance → Commissioning → Value 3 display

Description

Select the measured value that is shown third on the local display.

Additional information:

The applicable unit of measure is specified in the "System units" submenu.

Selection

- None
- Volume flow
- Mass flow
- Conductivity *
- Corrected conductivity *
- Temperature *
- Totalizer 1
- Totalizer 2
- Totalizer 3

Value 4 display**Navigation**

Guidance → Commissioning → Value 4 display

Description

Select the measured value that is shown fourth on the local display.



Additional information:

The applicable unit of measure is specified in the "System units" submenu.



* Visibility depends on order options or device settings

Selection	<ul style="list-style-type: none"> ■ None ■ Volume flow ■ Mass flow ■ Conductivity * ■ Corrected conductivity * ■ Temperature * ■ Totalizer 1 ■ Totalizer 2 ■ Totalizer 3
------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



Display damping

Navigation	  Guidance → Commissioning → Display damping
Description	<p>Enter time constant (PT1 element) to set reaction time of the display to fluctuations in the measured value.</p> <p>Additional information:</p> <ul style="list-style-type: none"> - The smaller the time constant the faster the display reacts to fluctuations in the measured value. - If the time constant is set to 0, damping is deactivated.
User entry	0.0 to 999.9 s



2.1.9 Date/time

Navigation   Guidance → Commissioning

Time format

Navigation	  Guidance → Commissioning → Time format
Description	Select time format.
Selection	<ul style="list-style-type: none"> ■ 24 h ■ 12 h AM/PM

Time zone

Navigation	  Guidance → Commissioning → Time zone
Description	Select the time zone. Every time the time zone is changed, a logbook entry is created.

* Visibility depends on order options or device settings

Selection*Other units*

- UTC-12:00
- UTC-11:00
- UTC-10:00
- UTC-09:30
- UTC-09:00
- UTC-08:00
- UTC-07:00
- UTC-06:00
- UTC-05:00
- UTC-04:00
- UTC-03:30
- UTC-03:00
- UTC-02:00
- UTC-01:00
- UTC 00:00
- UTC+01:00
- UTC+02:00
- UTC+03:00
- UTC+03:30
- UTC+04:00
- UTC+04:30
- UTC+05:00
- UTC+05:30
- UTC+05:45
- UTC+06:00
- UTC+06:30
- UTC+07:00
- UTC+08:00
- UTC+08:45
- UTC+09:00
- UTC+09:30
- UTC+10:00
- UTC+10:30
- UTC+11:00
- UTC+12:00
- UTC+12:45
- UTC+13:00
- UTC+14:00

Set date/time**Navigation**

 Guidance → Commissioning → Set date/time

Description

Set the date and local time. Every time the date or time is changed, a logbook entry is created.






User entry

Date and time

3 "Diagnostics" menu







Troubleshooting and preventive maintenance – settings for device behavior during process and device events as well as assistance and measures for diagnostic purposes.

Navigation  Diagnostics


Diagnostics	
▶ Active diagnostics	→  42
▶ Diagnostic list	→  44
▶ Simulation	→  47
▶ Heartbeat Technology	→  52
▶ Diagnostic settings	→  53

3.1 "Actual diagnostics" submenu

Navigation  Diagnostics → Active diagnos.

▶ Active diagnostics	
Actual diagnostics	→  42
Timestamp	→  42
Previous diagnostics	→  42
Timestamp	→  43
Operating time from restart	→  43
Operating time	→  43

Actual diagnostics


Navigation  Diagnostics → Active diagnos. → Actual diagnos.

Prerequisite A diagnostic event has occurred.

Description Displays the currently active diagnostic message.
If there is more than one pending diagnostic event, the message for the diagnostic event with the highest priority is displayed.

User interface Positive integer

Timestamp

Navigation  Diagnostics → Active diagnos. → Timestamp

Description Displays the timestamp for the currently active diagnostic message.

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

Previous diagnostics


Navigation  Diagnostics → Active diagnos. → Prev.diagnostics

Prerequisite At least two diagnostic events have already occurred.

Description Displays the diagnostic message for the last diagnostic event that has ended.

User interface Positive integer


Timestamp

Navigation  Diagnostics → Active diagnos. → Timestamp

Description Displays the timestamp of the diagnostic message generated for the last diagnostic event that has ended.

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


Operating time from restart

Navigation  Diagnostics → Active diagnos. → Time fr. restart

Description Indicates how long the device has been in operation since the last time the device was restarted.

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

Operating time











Navigation  Diagnostics → Active diagnos. → Operating time

Description Indicates how long the device has been in operation.


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

3.2 "Diagnostic list" submenu

Navigation  Diagnostics → Diagnostic list

► Diagnostic list	
Diagnostics 1	→  44
Timestamp	→  44
Diagnostics 2	→  45
Timestamp	→  45
Diagnostics 3	→  45
Timestamp	→  45
Diagnostics 4	→  45
Timestamp	→  46
Diagnostics 5	→  46
Timestamp	→  46

Diagnostics 1

Navigation  Diagnostics → Diagnostic list → Diagnostics 1

Description Displays the currently active diagnostic message with the highest priority.

User interface Positive integer


Timestamp

Navigation  Diagnostics → Diagnostic list → Timestamp


Description Displays the timestamp for the diagnostic message with the highest priority.

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


Diagnostics 2

Navigation	 Diagnostics → Diagnostic list → Diagnostics 2
Description	Displays the currently active diagnostic message with the second highest priority.
User interface	Positive integer


Timestamp

Navigation	 Diagnostics → Diagnostic list → Timestamp
Description	Displays the timestamp for the diagnostic message with the second highest priority.
User interface	Days (d), hours (h), minutes (m), seconds (s)


Diagnostics 3

Navigation	 Diagnostics → Diagnostic list → Diagnostics 3
Description	Displays the currently active diagnostic message with the third highest priority.
User interface	Positive integer


Timestamp

Navigation	 Diagnostics → Diagnostic list → Timestamp
Description	Displays the timestamp for the diagnostic message with the third highest priority.
User interface	Days (d), hours (h), minutes (m), seconds (s)


Diagnostics 4

Navigation	 Diagnostics → Diagnostic list → Diagnostics 4
Description	Displays the currently active diagnostic message with the fourth highest priority.
User interface	Positive integer


Timestamp

Navigation	 Diagnostics → Diagnostic list → Timestamp
Description	Displays the timestamp for the diagnostic message with the fourth highest priority.
User interface	Days (d), hours (h), minutes (m), seconds (s)

Diagnostics 5














Navigation	 Diagnostics → Diagnostic list → Diagnostics 5
Description	Displays the currently active diagnostic message with the fifth-highest priority.
User interface	Positive integer

Timestamp


Navigation	 Diagnostics → Diagnostic list → Timestamp
Description	Displays the timestamp for the diagnostic message with the fifth highest priority.
User interface	Days (d), hours (h), minutes (m), seconds (s)

3.3 "Simulation" submenu

Navigation  Diagnostics → Simulation

► Simulation	
Assign simulation process variable	→  47
Process variable value	→  48
Current output 1 simulation	→  48
Current output value	→  48
Frequency output 1 simulation	→  49
Frequency output 1 value	→  49
Pulse output simulation 1	→  49
Pulse value 1	→  50
Switch output simulation 1	→  50
Switch state 1	→  50
Device alarm simulation	→  51
Diagnostic event category	→  51
Diagnostic event simulation	→  51










Assign simulation process variable

Navigation  Diagnostics → Simulation → Assign proc.var.

Description Select a process variable for the simulation, thereby activating it.

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

* Visibility depends on order options or device settings

Additional information	<i>Description</i> The display alternates between the measured value and a diagnostics message of the "function check" category (C) when simulation is active.
<hr/>	
Process variable value	
<hr/>	
Navigation	  Diagnostics → Simulation → Proc. var. value
Description	Enter the simulation value for the selected process variable. Processing of measured values downstream as well as the signal output follow this value. In this way, it is possible to verify whether the measuring device has been configured correctly. Additional information: The applicable unit of measure is specified in the "System units" submenu.
User entry	Signed floating-point number
<hr/>	
Current output 1 simulation	
<hr/>	
Navigation	  Diagnostics → Simulation → Curr.outp 1 sim.
Description	Switch simulation of the current output on or off. Additional information: When simulation is on, the current output signal is set to the value specified in the "Current output value" parameter.
Selection	<ul style="list-style-type: none"> ■ Off ■ On
Additional information	<i>Description</i> The display alternates between the measured value and a diagnostics message of the "function check" category (C) when simulation is active.
<hr/>	
Current output value	
<hr/>	
Navigation	  Diagnostics → Simulation → Curr.outp val.
Description	Enter the current value for the simulation. In this manner, it is possible to verify the current output is configured correctly and downstream processing units are functioning properly. Additional information: The valid input range is determined by the "Current range output" parameter.
User entry	3.59 to 21.5 mA

Frequency output 1 simulation


Navigation	Diagnostics → Simulation → Freq.outp 1 sim.
Description	Switch simulation of the frequency output on or off.
Selection	<ul style="list-style-type: none"> ■ Off ■ On
Additional information	<p><i>Description</i></p> <p>The display alternates between the measured value and a diagnostics message of the "function check" category (C) when simulation is active.</p>



Frequency output 1 value



Navigation	Diagnostics → Simulation → Freq.outp 1 val.
Description	Enter the frequency value for the simulation. In this manner, it is possible to verify the frequency output is configured correctly and downstream processing units are functioning properly.
User entry	0.0 to 12 500.0 Hz



Pulse output simulation 1


Navigation	Diagnostics → Simulation → Puls.outp.sim. 1
Description	Switch simulation of the pulse output on or off.
Selection	<ul style="list-style-type: none"> ■ Off ■ Fixed value ■ Down-counting value
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Off option Simulation of the pulse output is switched off. The device is in standard operation mode or another process variable is being simulated. ■ Fixed value option Pulses are emitted continuously with the pulse width specified in the "Pulse width" parameter. ■ Down-counting value option The number of pulses specified in the "Pulse value " parameter are emitted. <p><i>Description</i></p> <p>The display alternates between the measured value and a diagnostics message of the "function check" category (C) when simulation is active.</p>



Pulse value 1 

Navigation	  Diagnostics → Simulation → Pulse value 1
Description	Enter the number of pulses to simulate the pulse output. In this manner, it is possible to verify the pulse output is configured correctly and downstream processing units are functioning properly.
User entry	0 to 65 535

Switch output simulation 1 


Navigation	  Diagnostics → Simulation → Switch sim. 1
Description	Switch simulation of the switch output on or off. Additional information: When simulation is on, the switch output is set to the state specified in the "Switch state " parameter.
Selection	<ul style="list-style-type: none"> ▪ Off ▪ On
Additional information	<p><i>Description</i></p> <p>The display alternates between the measured value and a diagnostics message of the "function check" category (C) when simulation is active.</p>

Switch state 1 

Navigation	  Diagnostics → Simulation → Switch state 1
Description	Select a switch state. In this manner, it is possible to verify the switch output is configured correctly and downstream processing units are functioning properly.
Selection	<ul style="list-style-type: none"> ▪ Open ▪ Closed
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ▪ Open option The switch output is not conductive. ▪ Closed option The switch output is conductive.

Device alarm simulation



Navigation  Diagnostics → Simulation → Dev. alarm sim.


Description Switch the device alarm simulation on or off.
While simulation is in progress, the display alternates between the measured value and a diagnostic message of the Function Check (C) category.

Selection

- Off
- On

Diagnostic event category



Navigation  Diagnostics → Simulation → Event category


Description Select the category of diagnostic events that should be available for selection in the "Diagnostic event simulation" parameter.

Selection

- Sensor
- Electronics
- Configuration
- Process

Diagnostic event simulation




Navigation  Diagnostics → Simulation → Diag. event sim.


Description Select the diagnostic event to simulate.

Selection Off

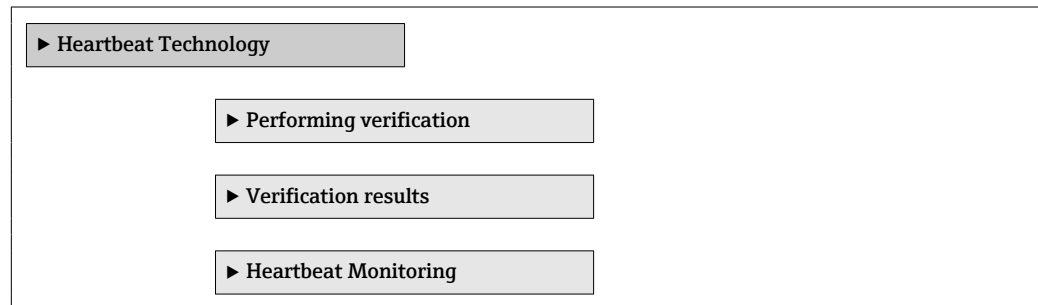
3.4 "Heartbeat Technology" submenu

The **Heartbeat Technology** submenu (→  52) is only available with the optional "Heartbeat Verification + Monitoring" application package.

- Order code for: Application package
- Option: EB "Heartbeat Verification + Monitoring"



 Detailed information and all descriptions of the device parameters of the application package are available in the "Heartbeat Verification + Monitoring" Special Documentation

Navigation   Diagnostics → HBT





3.5 "Diagnostic settings" submenu

Navigation  Diagnostics → Diag. settings


- ▶ Diagnostic settings
- ▶ Properties →  53
- ▶ Diagnostic configuration →  53

3.5.1 "Properties" submenu

Navigation  Diagnostics → Diag. settings → Properties

- ▶ Properties
- Alarm delay →  53

Alarm delay





Navigation  Diagnostics → Diag. settings → Properties → Alarm delay

Description Enter a duration for the alarm delay. When a diagnostic event of the "Alarm" category occurs, the diagnostic message is not generated until the delay has elapsed.


User entry 0 to 60 s

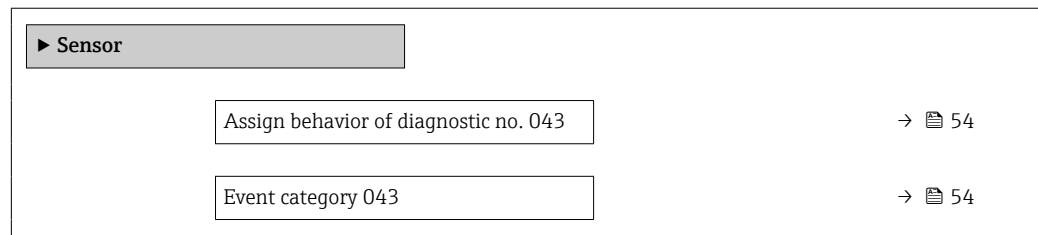
3.5.2 "Diagnostic configuration" submenu


Navigation  Diagnostics → Diag. settings → Diag. config.


- ▶ Diagnostic configuration
- ▶ Sensor →  54
- ▶ Electronics →  55
- ▶ Configuration →  58
- ▶ Process →  61

"Sensor" submenu

Navigation  Diagnostics → Diag. settings → Diag. config. → Sensor




Assign behavior of diagnostic no. 043 


Navigation  Diagnostics → Diag. settings → Diag. config. → Sensor → Diagnostic no. 043

Description Select behavior for diagnostic event "043 Sensor short circuit detected".

- Selection**
- Off
 - Alarm
 - Warning
 - Logbook entry only

- Additional information** *Selection*
- **Off** option
The diagnostic event is ignored and no diagnostic message is generated or logged.
 - **Alarm** option
The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.
 - **Warning** option
The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.
 - **Logbook entry only** option
The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 043 











Navigation  Diagnostics → Diag. settings → Diag. config. → Sensor → Event category 043

Description Select event category (status signal) for diagnostic event "043 Sensor short circuit detected".

- Selection**
- Failure (F)
 - Function check (C)
 - Out of specification (S)
 - Maintenance required (M)
 - No effect (N)


"Electronics" submenu

Navigation  Diagnostics → Diag. settings → Diag. config. → Electronics

▶ Electronics	
Assign behavior of diagnostic no. 230	→  55
Event category 230	→  55
Assign behavior of diagnostic no. 231	→  56
Event category 231	→  56
Assign behavior of diagnostic no. 302	→  56
Event category 302	→  56
Assign behavior of diagnostic no. 376	→  57
Event category 376	→  57
Assign behavior of diagnostic no. 377	→  58
Event category 377	→  58

Assign behavior of diagnostic no. 230



Navigation  Diagnostics → Diag. settings → Diag. config. → Electronics → Diagnostic no. 230

Description Select behavior for diagnostic event "230 Date/time incorrect".

- Selection**
- Alarm
 - Warning
 - Logbook entry only

Event category 230





Navigation  Diagnostics → Diag. settings → Diag. config. → Electronics → Event category 230

Description Select event category (status signal) for diagnostic event "230 Date/time incorrect".

- Selection**
- Failure (F)
 - Function check (C)
 - Out of specification (S)
 - Maintenance required (M)
 - No effect (N)



Assign behavior of diagnostic no. 231

Navigation   Diagnostics → Diag. settings → Diag. config. → Electronics → Diagnostic no. 231

Description Select behavior for diagnostic event "231 Date/time not available".

- Selection**
- Alarm
 - Warning
 - Logbook entry only



Event category 231

Navigation   Diagnostics → Diag. settings → Diag. config. → Electronics → Event category 231

Description Select event category (status signal) for diagnostic event "231 Date/time not available".

- Selection**
- Failure (F)
 - Function check (C)
 - Out of specification (S)
 - Maintenance required (M)
 - No effect (N)



Assign behavior of diagnostic no. 302

Navigation   Diagnostics → Diag. settings → Diag. config. → Electronics → Diagnostic no. 302

Description Select behavior for diagnostic event "302 Device verification active".

- Selection**
- Off
 - Warning
 - Logbook entry only

Event category 302

Navigation   Diagnostics → Diag. settings → Diag. config. → Electronics → Event category 302

Description Select event category (status signal) for diagnostic event "302 Device verification active".

- Selection**
- Failure (F)
 - Function check (C)
 - Out of specification (S)
 - Maintenance required (M)
 - No effect (N)

Assign behavior of diagnostic no. 376



Navigation Diagnostics → Diag. settings → Diag. config. → Electronics → Diagnostic no. 376

Description Select behavior for diagnostic event "376 Main electronics faulty".

- Selection**
- Off
 - Alarm
 - Warning
 - Logbook entry only

Additional information *Selection*

- **Off** option
The diagnostic event is ignored and no diagnostic message is generated or logged.
- **Alarm** option
The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.
- **Warning** option
The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.
- **Logbook entry only** option
The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 376



Navigation Diagnostics → Diag. settings → Diag. config. → Electronics → Event category 376

Description Select event category (status signal) for diagnostic event "376 Sensor electronics (ISEM) faulty".

- Selection**
- Failure (F)
 - Function check (C)
 - Out of specification (S)
 - Maintenance required (M)
 - No effect (N)

Assign behavior of diagnostic no. 377



Navigation Diagnostics → Diag. settings → Diag. config. → Electronics → Diagnostic no. 377

Description Select behavior for diagnostic event "377 Sensor electronics (ISEM) faulty".

- Selection**
- Off
 - Alarm
 - Warning
 - Logbook entry only

Additional information *Selection*

- **Off** option
The diagnostic event is ignored and no diagnostic message is generated or logged.
- **Alarm** option
The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.
- **Warning** option
The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.
- **Logbook entry only** option
The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 377



Navigation Diagnostics → Diag. settings → Diag. config. → Electronics → Event category 377

Description Select event category (status signal) for diagnostic event "377 Sensor electronics (ISEM) faulty".

- Selection**
- Failure (F)
 - Function check (C)
 - Out of specification (S)
 - Maintenance required (M)
 - No effect (N)

"Configuration" submenu

Navigation Diagnostics → Diag. settings → Diag. config. → Configuration

▶ Configuration

Assign behavior of diagnostic no. 441	→ 59
Event category 441	→ 59

Assign behavior of diagnostic no. 442	→ 60
Event category 442	→ 60
Assign behavior of diagnostic no. 443	→ 60
Event category 443	→ 61

Assign behavior of diagnostic no. 441



Navigation	Diagnostics → Diag. settings → Diag. config. → Configuration → Diagnostic no. 441
Description	Select behavior for diagnostic event "441 Current output faulty".
Selection	<ul style="list-style-type: none"> ■ Off ■ Alarm ■ Warning ■ Logbook entry only
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Off option The diagnostic event is ignored and no diagnostic message is generated or logged. ■ Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated. ■ Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated. ■ Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 441



Navigation	Diagnostics → Diag. settings → Diag. config. → Configuration → Event category 441
Description	Select event category (status signal) for diagnostic event "441 Current output faulty".
Selection	<ul style="list-style-type: none"> ■ Failure (F) ■ Function check (C) ■ Out of specification (S) ■ Maintenance required (M) ■ No effect (N)

Assign behavior of diagnostic no. 442


Navigation Diagnostics → Diag. settings → Diag. config. → Configuration → Diagnostic no. 442

Description Select behavior for diagnostic event "442 Frequency output faulty".

- Selection**
- Off
 - Alarm
 - Warning
 - Logbook entry only

Additional information *Selection*

- **Off** option
The diagnostic event is ignored and no diagnostic message is generated or logged.
- **Alarm** option
The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.
- **Warning** option
The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.
- **Logbook entry only** option
The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 442


Navigation Diagnostics → Diag. settings → Diag. config. → Configuration → Event category 442

Description Select event category (status signal) for diagnostic event "442 Frequency output faulty".

- Selection**
- Failure (F)
 - Function check (C)
 - Out of specification (S)
 - Maintenance required (M)
 - No effect (N)

Assign behavior of diagnostic no. 443


Navigation Diagnostics → Diag. settings → Diag. config. → Configuration → Diagnostic no. 443

Description Select behavior for diagnostic event "443 Pulse output faulty".

- Selection**
- Off
 - Alarm
 - Warning
 - Logbook entry only

Additional information

Selection

- **Off** option
The diagnostic event is ignored and no diagnostic message is generated or logged.
- **Alarm** option
The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.
- **Warning** option
The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.
- **Logbook entry only** option
The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 443



Navigation

Diagnostics → Diag. settings → Diag. config. → Configuration → Event category 443

Description

Select event category (status signal) for diagnostic event "443 Pulse output faulty".

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

"Process" submenu

Navigation

Diagnostics → Diag. settings → Diag. config. → Process



▶ **Process**

Assign behavior of diagnostic no. 832	→ 62
Event category 832	→ 63
Assign behavior of diagnostic no. 833	→ 63
Event category 833	→ 63
Assign behavior of diagnostic no. 834	→ 64
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Assign behavior of diagnostic no. 842	→  65
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Assign behavior of diagnostic no. 937	→  66
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Event category 938	→  67
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Event category 961	→  68
Assign behavior of diagnostic no. 962	→  68
Event category 962	→  69

Assign behavior of diagnostic no. 832

Navigation

  Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 832

Description

Select behavior for diagnostic event "832 Electronics temperature too high".

Selection

- Off
- Alarm
- Warning
- Logbook entry only

Additional information

Selection

- **Off** option
The diagnostic event is ignored and no diagnostic message is generated or logged.
- **Alarm** option
The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.
- **Warning** option
The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.
- **Logbook entry only** option
The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 832


Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Event category 832
Description	Select event category (status signal) for diagnostic event "832 Electronics temperature too high".
Selection	<ul style="list-style-type: none"> ▪ Failure (F) ▪ Function check (C) ▪ Out of specification (S) ▪ Maintenance required (M) ▪ No effect (N)

Assign behavior of diagnostic no. 833




Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 833
Description	Select behavior for diagnostic event "833 Electronics temperature too low".
Selection	<ul style="list-style-type: none"> ▪ Off ▪ Alarm ▪ Warning ▪ Logbook entry only
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ▪ Off option The diagnostic event is ignored and no diagnostic message is generated or logged. ▪ Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated. ▪ Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated. ▪ Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 833


Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Event category 833
Description	Select event category (status signal) for diagnostic event "833 Electronics temperature too low".

- Selection**
- Failure (F)
 - Function check (C)
 - Out of specification (S)
 - Maintenance required (M)
 - No effect (N)

Assign behavior of diagnostic no. 834

Navigation   Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 834



Description Select event category (status signal) for diagnostic event "834 Process temperature too high".

- Selection**
- Off
 - Alarm
 - Warning
 - Logbook entry only

Additional information *Selection*

- **Off** option
The diagnostic event is ignored and no diagnostic message is generated or logged.
- **Alarm** option
The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.
- **Warning** option
The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.
- **Logbook entry only** option
The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 834

Navigation   Diagnostics → Diag. settings → Diag. config. → Process → Event category 834

Description Select event category (status signal) for diagnostic event "834 Process temperature too high".

- Selection**
- Failure (F)
 - Function check (C)
 - Out of specification (S)
 - Maintenance required (M)
 - No effect (N)

Assign behavior of diagnostic no. 835


Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 835
Description	Select behavior for diagnostic event "835 Process temperature too low".
Selection	<ul style="list-style-type: none"> ▪ Off ▪ Alarm ▪ Warning ▪ Logbook entry only
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ▪ Off option The diagnostic event is ignored and no diagnostic message is generated or logged. ▪ Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated. ▪ Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated. ▪ Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 835


Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Event category 835
Description	Select event category (status signal) for diagnostic event "835 Process temperature too low".
Selection	<ul style="list-style-type: none"> ▪ Failure (F) ▪ Function check (C) ▪ Out of specification (S) ▪ Maintenance required (M) ▪ No effect (N)

Assign behavior of diagnostic no. 842


Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 842
Description	Select behavior for diagnostic event "842 Process value above limit".
Selection	<ul style="list-style-type: none"> ▪ Off ▪ Alarm ▪ Warning ▪ Logbook entry only

Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Off option The diagnostic event is ignored and no diagnostic message is generated or logged. ■ Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated. ■ Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated. ■ Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.
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Event category 842


Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Event category 842
Description	Select event category (status signal) for diagnostic event "842 Process value above limit".
Selection	<ul style="list-style-type: none"> ■ Failure (F) ■ Function check (C) ■ Out of specification (S) ■ Maintenance required (M) ■ No effect (N)

Assign behavior of diagnostic no. 937


Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 937
Description	Select behavior for diagnostic event "937 Sensor symmetry".
Selection	<ul style="list-style-type: none"> ■ Off ■ Alarm ■ Warning ■ Logbook entry only
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Off option The diagnostic event is ignored and no diagnostic message is generated or logged. ■ Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated. ■ Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated. ■ Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 937



Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Event category 937
Description	Select event category (status signal) for diagnostic event "937 Sensor symmetry".
Selection	<ul style="list-style-type: none"> ■ Failure (F) ■ Function check (C) ■ Out of specification (S) ■ Maintenance required (M) ■ No effect (N)

Assign behavior of diagnostic no. 938



Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 938
Description	Select behavior for diagnostic event "938 EMC interference".
Selection	<ul style="list-style-type: none"> ■ Off ■ Alarm ■ Warning ■ Logbook entry only
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Off option The diagnostic event is ignored and no diagnostic message is generated or logged. ■ Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated. ■ Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated. ■ Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 938



Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Event category 938
Description	Select event category (status signal) for diagnostic event "938 EMC interference".
Selection	<ul style="list-style-type: none"> ■ Failure (F) ■ Function check (C) ■ Out of specification (S) ■ Maintenance required (M) ■ No effect (N)

Assign behavior of diagnostic no. 961


Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 961
Description	Select behavior for diagnostic event "961 Electrode potential out of specification".
Selection	<ul style="list-style-type: none"> ■ Off ■ Alarm ■ Warning ■ Logbook entry only
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Off option The diagnostic event is ignored and no diagnostic message is generated or logged. ■ Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated. ■ Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated. ■ Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 961


Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Event category 961
Description	Select event category (status signal) for diagnostic event "961 Electrode potential out of specification".
Selection	<ul style="list-style-type: none"> ■ Failure (F) ■ Function check (C) ■ Out of specification (S) ■ Maintenance required (M) ■ No effect (N)

Assign behavior of diagnostic no. 962


Navigation	Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 962
Description	Select behavior for diagnostic event "962 Pipe empty".
Selection	<ul style="list-style-type: none"> ■ Off ■ Alarm ■ Warning ■ Logbook entry only

Additional information*Selection*

- **Off** option
The diagnostic event is ignored and no diagnostic message is generated or logged.
- **Alarm** option
The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.
- **Warning** option
The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.
- **Logbook entry only** option
The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.

Event category 962**Navigation**

Diagnostics → Diag. settings → Diag. config. → Process → Event category 962

Description

Select event category (status signal) for diagnostic event "962 Pipe empty".








Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

4 "Application" menu







Targeted optimization to the application – comprehensive device settings from sensor technology to system integration for optimum application adaptation.

Navigation  Application


Application	
▶ Measured values	→  70
▶ System units	→  74
▶ Totalizers	→  79
▶ Sensor	→  84
▶ Current output 1	→  95
▶ Pulse/frequency/switch output 1	→  106
▶ Communication	→  124

4.1 "Measured values" submenu


Navigation  Application → Measured values

▶ Measured values	
Mass flow	→  71
Volume flow	→  71
Conductivity	→  71
Corrected conductivity	→  72
Temperature	→  72
▶ Totalizer	→  72




Mass flow

Navigation	 Application → Measured values → Mass flow
Description	Displays the mass flow currently calculated. Additional information: The applicable unit of measure is specified in the "System units" submenu.
User interface	Signed floating-point number




Volume flow

Navigation	 Application → Measured values → Volume flow
Description	Displays the volume flow currently measured. Additional information: The applicable unit of measure is specified in the "System units" submenu.
User interface	Signed floating-point number


Conductivity

Navigation	 Application → Measured values → Conductivity
Prerequisite	Conductivity measurement is switched on in the Conductivity measurement parameter (→  85).  Conductivity measurement is only optionally available: Under order code for "Functionality", option D (extended transmitter) and order code for "Sensor option", option CX (conductivity measurement)
Description	Displays the conductivity currently measured. Additional information: The applicable unit of measure is specified in the "System units" submenu.
User interface	Positive floating-point number

Corrected conductivity

Navigation	 Application → Measured values → CorrConductivity
Prerequisite	Conductivity measurement is switched on in the Conductivity measurement parameter (→  85).  Conductivity measurement is only optionally available: Under order code for "Functionality", option D (extended transmitter) and order code for "Sensor option", option CX (conductivity measurement)
Description	Displays the currently measured conductivity compensated for temperature. Additional information: The applicable unit of measure is specified in the "System units" submenu.
User interface	Positive floating-point number



Temperature




Navigation	 Application → Measured values → Temperature
Prerequisite	Temperature measurement is only optionally available for Promag H 10 (5HBB): Under order code for "Functionality", option D (extended transmitter) and order code for "Sensor option", option CI (medium temperature measurement)
Description	Displays the medium temperature currently measured. Additional information: The applicable unit of measure is specified in the "System units" submenu.
User interface	Positive floating-point number




4.1.1 "Totalizer" submenu

Navigation  Application → Measured values → Totalizer

▶ Totalizer








Totalizer value 1 to n	→  73
Totalizer overflow 1 to n	→  73

Totalizer value 1 to n 	
Navigation	  Application → Measured values → Totalizer → Totalizer val. 1 to n
Prerequisite	A process variable has been selected in the Assign process variable parameter in the Totalizer 1 to n submenu.
Description	<p>Displays the current totalizer counter.</p> <p>Additional information: Since the operating tool cannot display figures with more than 7 digits, the current counter above this range equals the sum of the totalizer counter plus the overflow displayed for the "Totalizer overflow" parameter.</p> <p>Example for how to calculate the current totalizer counter when the value exceeds the 7 digit display range limit of the operating tool:</p> <ul style="list-style-type: none"> - Value of "Totalizer value" parameter: 1,968,457 m³ - Value of "Totalizer overflow" parameter: $1 \times 10^7 \text{ m}^3 = 10,000,000 \text{ m}^3$ - Current totalizer reading: 11,968,457 m³ <p>In the event of an error, the totalizer behaves as specified in the "Failure mode" parameter.</p>
User interface	Signed floating-point number

Totalizer overflow 1 to n 	
Navigation	  Application → Measured values → Totalizer → Tot. overflow 1 to n
Prerequisite	A process variable has been selected in the Assign process variable parameter in the Totalizer 1 to n submenu.
Description	<p>Displays the current totalizer overflow.</p> <p>Additional information: If the current totalizer counter exceeds the operating tool's maximum numerical display range of 7 digits, the amount above this range is expressed as an overflow. The current totalizer counter therefore equals the sum of the overflow and the totalizer value displayed in the "Totalizer value" parameter.</p> <p>Example of how to calculate the current totalizer counter when the value exceeds the 7 digit display limit of the operating tool:</p> <ul style="list-style-type: none"> - Value of "Totalizer value" parameter: 1,968,457 m³ - Value of "Totalizer overflow" parameter: $1 \times 10^7 \text{ m}^3 = 10,000,000 \text{ m}^3$ - Current totalizer reading: 11,968,457 m³
User interface	-32 000.0 to 32 000.0

4.2 "System units" submenu

Navigation  Application → System units

▶ System units	
Volume flow unit	→  74
Volume unit	→  75
Mass flow unit	→  76
Mass unit	→  76
Density unit	→  77
Temperature unit	→  77
Conductivity unit	→  77

Volume flow unit

Navigation  Application → System units → Volume flow unit

Description Select volume flow unit.

Selection	<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
	■ cm ³ /s	■ af/s	■ gal/s (imp)
	■ cm ³ /min	■ af/min	■ gal/min (imp)
	■ cm ³ /h	■ af/h	■ gal/h (imp)
	■ cm ³ /d	■ af/d	■ gal/d (imp)
	■ dm ³ /s	■ ft ³ /s	■ Mgal/s (imp)
	■ dm ³ /min	■ ft ³ /min	■ Mgal/min (imp)
	■ dm ³ /h	■ ft ³ /h	■ Mgal/h (imp)
	■ dm ³ /d	■ ft ³ /d	■ Mgal/d (imp)
	■ m ³ /s	■ MMft ³ /s	■ bbl/s (imp;beer)
	■ m ³ /min	■ MMft ³ /min	■ bbl/min (imp;beer)
	■ m ³ /h	■ MMft ³ /h	■ bbl/h (imp;beer)
	■ m ³ /d	■ Mft ³ /d	■ bbl/d (imp;beer)
	■ ml/s	■ fl oz/s (us)	■ bbl/s (imp;oil)
	■ ml/min	■ fl oz/min (us)	■ bbl/min (imp;oil)
	■ ml/h	■ fl oz/h (us)	■ bbl/h (imp;oil)
	■ ml/d	■ fl oz/d (us)	■ bbl/d (imp;oil)
	■ l/s	■ gal/s (us)	
	■ l/min	■ gal/min (us)	
	■ l/h	■ gal/h (us)	
	■ l/d	■ gal/d (us)	
	■ hl/s	■ Mgal/s (us)	
	■ hl/min	■ Mgal/min (us)	
	■ hl/h	■ Mgal/h (us)	
	■ hl/d	■ Mgal/d (us)	
	■ Ml/s	■ bbl/s (us;liq.)	
	■ Ml/min	■ bbl/min (us;liq.)	
	■ Ml/h	■ bbl/h (us;liq.)	
	■ Ml/d	■ bbl/d (us;liq.)	
		■ bbl/s (us;beer)	
		■ bbl/min (us;beer)	
		■ bbl/h (us;beer)	
		■ bbl/d (us;beer)	
		■ bbl/s (us;oil)	
		■ bbl/min (us;oil)	
		■ bbl/h (us;oil)	
		■ bbl/d (us;oil)	
		■ bbl/s (us;tank)	
		■ bbl/min (us;tank)	
		■ bbl/h (us;tank)	
		■ bbl/d (us;tank)	
		■ kgal/s (us)	
		■ kgal/min (us)	
		■ kgal/h (us)	
		■ kgal/d (us)	

Volume unit
**Navigation**

Application → System units → Volume unit

Description

Select volume unit.

Selection	<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
	<ul style="list-style-type: none"> ■ cm³ ■ dm³ ■ m³ ■ ml ■ l ■ hl ■ Ml Mega 	<ul style="list-style-type: none"> ■ af ■ ft³ ■ Mft³ ■ fl oz (us) ■ gal (us) ■ kgal (us) ■ Mgal (us) ■ bbl (us;oil) ■ bbl (us;liq.) ■ bbl (us;beer) ■ bbl (us;tank) 	<ul style="list-style-type: none"> ■ gal (imp) ■ Mgal (imp) ■ bbl (imp;beer) ■ bbl (imp;oil)

Mass flow unit



Navigation Application → System units → Mass flow unit

Description Select mass flow unit.

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

Mass unit



Navigation Application → System units → Mass unit

Description Select mass unit.

Selection	<i>SI units</i>	<i>US units</i>
	<ul style="list-style-type: none"> ■ g ■ kg ■ t 	<ul style="list-style-type: none"> ■ oz ■ lb ■ STon

Density unit


Navigation   Application → System units → Density unit

Description Select density unit.

Selection

<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
▪ g/cm ³	▪ lb/ft ³	▪ lb/gal (imp)
▪ g/m ³	▪ lb/gal (us)	▪ lb/bbl (imp;beer)
▪ kg/l	▪ lb/bbl (us;liq.)	▪ lb/bbl (imp;oil)
▪ kg/dm ³	▪ lb/bbl (us;beer)	
▪ kg/m ³	▪ lb/bbl (us;oil)	
▪ SD4°C	▪ lb/bbl (us;tank)	
▪ SD15°C		
▪ SD20°C		
▪ SG4°C		
▪ SG15°C		
▪ SG20°C		

Temperature unit



Navigation   Application → System units → Temperature unit

Prerequisite Temperature measurement is only optionally available for Promag H 10 (5HBB): Under order code for "Functionality", option D (extended transmitter) and order code for "Sensor option", option CI (medium temperature measurement)


Description Select temperature unit.


Selection

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

Conductivity unit


Navigation   Application → System units → Conductiv. unit

Prerequisite Conductivity measurement is switched on in the **Conductivity measurement** parameter (→  85).

 Conductivity measurement is only optionally available: Under order code for "Functionality", option D (extended transmitter) and order code for "Sensor option", option CX (conductivity measurement)

Description Select conductivity unit.



Selection

SI units

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


4.3 "Totalizers" submenu

Navigation   Application → Totalizers

▶ Totalizers		
▶ Totalizer handling		→  79
▶ Totalizer 1 to n		→  79



4.3.1 "Totalizer handling" submenu

Navigation   Application → Totalizers → Totalizer

▶ Totalizer handling		
Reset all totalizers		→  79

Reset all totalizers

Navigation

  Application → Totalizers → Totalizer → Reset all tot.



Description





Reset all totalizers to "0" and restart the totaling process. All flow quantities thus far totalized are thereby deleted.



Selection


- Cancel
- Reset + totalize

4.3.2 "Totalizer 1 to n" submenu



Navigation   Application → Totalizers → Totalizer 1 to n

▶ Totalizer 1 to n		
Assign process variable		→  80
Unit totalizer 1 to n		→  80
Totalizer operation mode		→  81
Control Totalizer 1 to n		→  81

Preset value 1 to n	→  82
Failure mode	→  82

Assign process variable 

Navigation

  Application → Totalizers → Totalizer 1 to n → Assign variable

Description


Select process variable for totalizer.

Additional information:

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

Selection

- Off
- Volume flow
- Mass flow

Unit totalizer 1 to n 

Navigation

  Application → Totalizers → Totalizer 1 to n → Unit totalizer 1 to n

Prerequisite

A process variable has been selected in the **Assign process variable** parameter in the **Totalizer 1 to n** submenu.

Description

Select process variable totalizer unit.

Selection

- | <i>SI units</i> | <i>US units</i> |
|-------------------|---------------------|
| ■ g [*] | ■ oz [*] |
| ■ kg [*] | ■ lb [*] |
| ■ t [*] | ■ STon [*] |

* Visibility depends on order options or device settings

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 [*] | ■ Mft ³ [*] | ■ bbl (imp;beer) [*] |
| ■ ml [*] | ■ fl oz (us) [*] | ■ bbl (imp;oil) [*] |
| ■ l [*] | ■ gal (us) [*] | |
| ■ hl [*] | ■ kgal (us) [*] | |
| ■ Ml Mega [*] | ■ Mgal (us) [*] | |
| | ■ bbl (us;liq.) [*] | |
| | ■ bbl (us;beer) [*] | |
| | ■ bbl (us;oil) [*] | |
| | ■ bbl (us;tank) [*] | |

* Visibility depends on order options or device settings

or


Other units

None *


* Visibility depends on order options or device settings

Additional information

Description



The unit is selected separately for each totalizer. The unit is independent of the option selected in the **System units** submenu (→  74).

Selection

The selection is dependent on the process variable selected in the **Assign process variable** parameter (→  14).

Totalizer operation mode

Navigation

  Application → Totalizers → Totalizer 1 to n → Operation mode

Prerequisite

A process variable has been selected in the **Assign process variable** parameter in the **Totalizer 1 to n** submenu.

Description

Select totalizer calculation mode.

Selection

- Net flow total
- Forward flow total
- Reverse flow total

Additional information

Selection

- **Net flow total** option
The flow values in the forward and reverse flow directions are totalized and netted against each other. Net flow is recorded in the flow direction.
- **Forward flow total** option
Only the flow in the forward flow direction is totalized.
- **Reverse flow total** option
Only the flow in the reverse flow direction is totalized (= reverse flow quantity).

Control Totalizer 1 to n

Navigation

  Application → Totalizers → Totalizer 1 to n → Control Tot. 1 to n

Prerequisite



A process variable has been selected in the **Assign process variable** parameter in the **Totalizer 1 to n** submenu.

Description


Operate the totalizer.

Selection	<ul style="list-style-type: none"> ■ Totalize ■ Reset + hold ■ Preset + hold ■ Reset + totalize ■ Hold
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Totalize option The totalizer is started or continues running. ■ Reset + hold option The totaling process is stopped and the totalizer is reset to "0". ■ Preset + hold option The totaling process is stopped and the totalizer is set to the start value specified in the "Preset value " parameter. ■ Reset + totalize option The totalizer is reset to "0" and the totaling process is restarted. ■ Hold option Totalizing is stopped.

Preset value 1 to n

Navigation	 Application → Totalizers → Totalizer 1 to n → Preset value 1 to n
Prerequisite	A process variable has been selected in the Assign process variable parameter in the Totalizer 1 to n submenu.
Description	Specify start value for totalizer.
User entry	Signed floating-point number
Additional information	<p><i>Description</i></p> <p>The unit of the selected process variable is specified for the totalizer in the Unit totalizer parameter (→  14).</p> <p><i>Example</i></p> <p>This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.</p>

Failure mode

Navigation	 Application → Totalizers → Totalizer 1 to n → Failure mode
Prerequisite	A process variable has been selected in the Assign process variable parameter in the Totalizer 1 to n submenu.
Description	<p>Specify how the totalizer should behave in the event of a device alarm.</p> <p>Additional information: The failsafe mode that applies to any other totalizers or outputs is specified separately in other parameters and is not impacted by this setting.</p>

Selection







- Stop
- Actual value
- Last valid value

Additional information*Selection*

- **Stop** option
The totalizer is stopped in the event of a device alarm.
- **Actual value** option
The totalizer continues to totalize based on the current value measured; the device alarm is ignored.
- **Last valid value** option
The totalizer continues to totalize based on the last valid value measured before the device alarm occurred.








4.4 "Sensor" submenu

Navigation  Application → Sensor

▶ Sensor		
▶ Process parameters		→  84
▶ Low flow cut off		→  87
▶ Empty pipe detection		→  88
▶ Sensor adjustment		→  90
▶ Calibration		→  91
▶ Electrode cleaning cycle		→  93

4.4.1 "Process parameters" submenu

Navigation  Application → Sensor → Process param.

▶ Process parameters		
Flow damping		→  85
Flow override		→  85
Conductivity measurement		→  85
Conductivity temperature coefficient		→  86
Conductivity damping time		→  86
Temperature damping time		→  87
Fixed density		→  87

Flow damping


Navigation	Application → Sensor → Process param. → Flow damping
Description	<p>Enter value for damping of the flow measured value in order to reduce the variability of the flow measured value when exposed to interference.</p> <p>Additional information: The depth of the flow filter is determined by this setting. As the filter depth increases, so does the reaction time of the device.</p> <ul style="list-style-type: none"> - Value = 0: No damping. Damping of 0 is not recommended, as the measuring signal is then so noisy that it is almost impossible to perform a measurement. - Value > 0: Damping increases <p>Optimal damping depends on the measuring period.</p> <p>Damping impacts the following measuring device variables:</p> <ul style="list-style-type: none"> - Outputs - Low flow cut off - Totalizers
User entry	0 to 15

Flow override


Navigation	Application → Sensor → Process param. → Flow override
Description	Stops the measuring process. Can be used for example when cleaning the pipeline.
Selection	<ul style="list-style-type: none"> ▪ Off ▪ On
Additional information	<p><i>Selection</i></p> <p>"On" option Activates flow override. The diagnostic message "453 Flow override active" is generated.</p> <p>Additional information: Output values:</p> <ul style="list-style-type: none"> - Temperature: Measurement continues - Totalizers 1 to 3: No longer totalize

Conductivity measurement


Navigation	Application → Sensor → Process param. → Conduct. measur.
Prerequisite	Conductivity measurement is only optionally available: Under order code for "Functionality", option D (extended transmitter) and order code for "Sensor option", option CX (conductivity measurement)

Description	Switch conductivity measurement on or off. Additional information: To be able to measure conductivity, the medium must have a minimum conductivity of 5 $\mu\text{S}/\text{cm}$.
Selection	<ul style="list-style-type: none"> ■ Off ■ On

Conductivity temperature coefficient


Navigation	Application → Sensor → Process param. → Cond. temp.coeff
Prerequisite	Conductivity measurement is switched on in the Conductivity measurement parameter (→ 85). Conductivity measurement is only optionally available: Under order code for "Functionality", option D (extended transmitter) and order code for "Sensor option", option CX (conductivity measurement)
Description	Enter the temperature coefficient for conductivity.
User entry	Signed floating-point number

Conductivity damping time


Navigation	Application → Sensor → Process param. → ConductDampTime
Prerequisite	Conductivity measurement is switched on in the Conductivity measurement parameter (→ 85). Conductivity measurement is only optionally available: Under order code for "Functionality", option D (extended transmitter) and order code for "Sensor option", option CX (conductivity measurement)
Description	Enter time constant for conductivity damping (PT1 element): - Value = 0: No damping - Value > 0: Damping increases Additional information: Damping is implemented by means of a proportional transmission behavior with first order delay (PT1 element).
User entry	0 to 999.9 s

Temperature damping time



Navigation	Application → Sensor → Process param. → TempDampingTime
Prerequisite	Temperature measurement is only optionally available for Promag H 10 (5HBB): Under order code for "Functionality", option D (extended transmitter) and order code for "Sensor option", option CI (medium temperature measurement)
Description	Enter time constant for damping the temperature value.
User entry	0 to 999.9 s

Fixed density



Navigation	Application → Sensor → Process param. → Fixed density
Description	Enter a fixed value for the density. Additional information: The applicable unit of measure is specified in the "System units" submenu.
User entry	Positive floating-point number

4.4.2 "Low flow cut off" submenu

Navigation Application → Sensor → Low flow cut off

▶ **Low flow cut off**

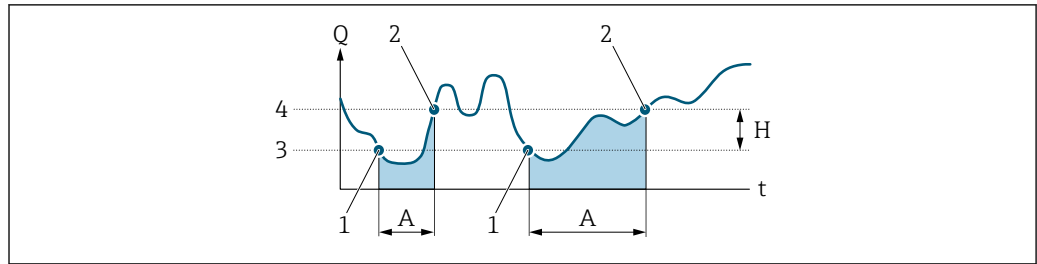
Low flow cut off	→ 87
On value low flow cutoff	→ 88
Off value low flow cutoff	→ 88

Low flow cut off



Navigation	Application → Sensor → Low flow cut off → Low flow cut off
Description	Select process variable for low flow cut off to activate low flow cut off.
Selection	<ul style="list-style-type: none"> ■ Off ■ Volume flow ■ Mass flow

Additional information Description



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

On value low flow cutoff



Navigation Application → Sensor → Low flow cut off → On value

Description Enter on value to switch on low flow cut off.
 Value = 0: No low flow cut off
 Value > 0: Low flow cut off is activated

User entry Positive floating-point number

Off value low flow cutoff



Navigation Application → Sensor → Low flow cut off → Off value

Description Enter off value to switch off low flow cut off. The off value is entered as a positive hysteresis with respect to the on value.

User entry 0 to 100.0 %

4.4.3 "Partially filled pipe detection" submenu

Navigation Application → Sensor → Partial pipe det

▶ Empty pipe detection

Empty pipe detection

→ 89

New adjustment	→ 89
Empty pipe adjust value	→ 89
Full pipe adjust value	→ 90
Measured value EPD	→ 90

Empty pipe detection



Navigation

Application → Sensor → Empty pipe det. → Empty pipe det.

Description

Switch empty pipe detection on or off. Switch on empty pipe detection to detect a partially filled or empty measuring tube.

Selection

- Off
- On

New adjustment



Navigation

Application → Sensor → Empty pipe det. → New adjustment

Description

Select empty pipe or full pipe adjustment to perform a new adjustment. To adjust empty pipe detection, perform the empty pipe adjustment first and then the full pipe adjustment.

Additional information:

The measuring device is pre-adjusted at production using water (approx. 300 µS/cm). For liquids that deviate from this conductivity, a new empty pipe and full pipe adjustment must be performed on site.

Selection

- Cancel
- Empty pipe adjust
- Full pipe adjust

Empty pipe adjust value



Navigation

Application → Sensor → Empty pipe det. → Empty pipe value

Description

Displays adjustment value when the measuring tube is empty.

NOTE

Users logged on in the Service role have write access!

User interface

Positive floating-point number

Full pipe adjust value



- Navigation** Application → Sensor → Empty pipe det. → Full pipe value
- Description** Displays adjustment value when the measuring tube is full.
NOTE
Users logged on in the Service role have write access!
- User interface** Positive floating-point number

Measured value EPD

- Navigation** Application → Sensor → Empty pipe det. → Meas. value EPD
- Description** Displays the value currently measured for empty pipe detection.
- User interface** Positive floating-point number

4.4.4 "Sensor adjustment" submenu

Navigation Application → Sensor → Sensor adjustm.

▶ **Sensor adjustment**

Installation direction	→ 90
Integration time	→ 91
Measuring period	→ 91

Installation direction



- Navigation** Application → Sensor → Sensor adjustm. → Install. direct.
- Description** Select sign of flow direction
- Selection**
 - Forward flow
 - Reverse flow

Integration time



Navigation	Application → Sensor → Sensor adjustm. → Integration time
Description	Displays the duration of an integration cycle. NOTE Users logged on in the Service role have write access!
User interface	1 to 65 ms

Measuring period



Navigation	Application → Sensor → Sensor adjustm. → Measuring period
Description	Displays the duration of a full measuring period. Additional information: The measuring period is the time span during which the excitation of the magnetic field takes place and a measuring point is created. NOTE Users logged on in the Service role have write access!
User interface	0 to 1 000 ms

4.4.5 "Calibration" submenu

Navigation Application → Sensor → Calibration

▶ Calibration


Nominal diameter	→ 91
Calibration factor	→ 92
Zero point	→ 92
Conductivity calibration factor	→ 92

Nominal diameter

Navigation	Application → Sensor → Calibration → Nominal diameter
Description	Shows the nominal diameter of the sensor.

User interface Character string comprising numbers, letters and special characters (#20)

Calibration factor

Navigation  Application → Sensor → Calibration → Cal. factor

Description Displays the current calibration factor for the flow rate measuring sensor.
Additional information:
The factory setting for the calibration factor can be found on the sensor's nameplate.

User interface Positive floating-point number

Zero point


Navigation  Application → Sensor → Calibration → Zero point


Description Displays the zero point correction value for the sensor.
NOTE
Users logged on in the Service role have write access!

User interface Signed floating-point number

Conductivity calibration factor

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

Prerequisite Conductivity measurement is switched on in the **Conductivity measurement** parameter (→  85).






 Conductivity measurement is only optionally available: Under order code for "Functionality", option D (extended transmitter) and order code for "Sensor option", option CX (conductivity measurement)

Description Displays calibration factor for conductivity measurement.
NOTE
Users logged on in the Service role have write access!


User interface 0.01 to 10 000

4.4.6 "Electrode cleaning cycle" submenu


Navigation  Application → Sensor → Elec. clean cycl

▶ Electrode cleaning cycle	
Electrode cleaning cycle	→  93
ECC duration	→  93
ECC recovery time	→  93
ECC interval	→  94
ECC polarity	→  94


Electrode cleaning cycle

Navigation	 Application → Sensor → Elec. clean cycl → Elec. clean cycl
Description	Switch electrode cleaning on or off.
Selection	<ul style="list-style-type: none"> ■ Off ■ On

ECC duration

Navigation	 Application → Sensor → Elec. clean cycl → ECC duration
Description	Enter the duration of the cleaning cycle.
User entry	0.01 to 30 s

ECC recovery time

Navigation	 Application → Sensor → Elec. clean cycl → ECC recov. time
Description	Specify a timespan for recovery after a cleaning cycle has completed to prevent interference with the signal outputs. The output signal values will be frozen for the duration of the recovery.
User entry	1 to 600 s

ECC interval

**Navigation**

Application → Sensor → Elec. clean cycl → ECC interval

Description

Specify the duration of the interval between one cleaning cycle and the next.

User entry

0.5 to 168 h

ECC polarity

Navigation

Application → Sensor → Elec. clean cycl → ECC polarity

Description

Displays the setting for the electrode cleaning polarity.

Additional information:

The polarity depends on the material of the electrodes:











- Platinum: Negative
- Tantalum, Alloy C22, stainless steel: Positive

User interface

- Positive
- Negative

4.5 "Current output" submenu

Navigation  Application → Curr.output 1

▶ Current output 1	
Process variable current output	→  95
Measuring mode current output	→  96
Current range output	→  100
Fixed current	→  101
Lower range value output	→  101
Upper range value output	→  103
Damping current output	→  103
Failure behavior current output	→  104
Failure current	→  104
Output current 1	→  105

Process variable current output

Navigation   Application → Curr.output 1 → Proc.var. outp

Description Select process variable for current output

- Selection
- Off *
 - Mass flow
 - Conductivity *
 - Corrected conductivity *
 - Volume flow
 - Temperature *
 - Noise *
 - Coil current shot time *

* Visibility depends on order options or device settings

Measuring mode current output

**Navigation**

Application → Curr.output 1 → Meas.mode outp

Prerequisite

A process variable is selected in the **Process variable current output** parameter (→ 21).

Description

Select the measuring mode for the output.

Selection

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

* Visibility depends on order options or device settings

Additional information*Selection*

- **Forward flow** option

The current output signal is proportional to the measured value for the process variable assigned.

Additional information:

- The lower limit value ("Lower range value output " parameter) and the upper limit value ("Upper range value output " parameter) of the measured value range do not have to have the same algebraic sign, i.e. the lower limit value can be negative and the upper limit value positive.
- If the measured value lies outside the scaled measured value range, diagnostic message "441 Current output faulty" is generated.

- **Forward/Reverse flow** option

The current output outputs the absolute value for the assigned process variable (reflection across the lower limit value of the measured value range).

Additional information:

- The lower limit value ("Lower range value output " parameter) and the upper limit value ("Upper range value output " parameter) of the measured value range must have the same algebraic sign.
- If the absolute value exceeds the upper limit value of the measured value range, diagnostic message "441 Current output faulty" is generated.
- This setting is generally only used for flow-related process variables.

- **Reverse flow compensation** option

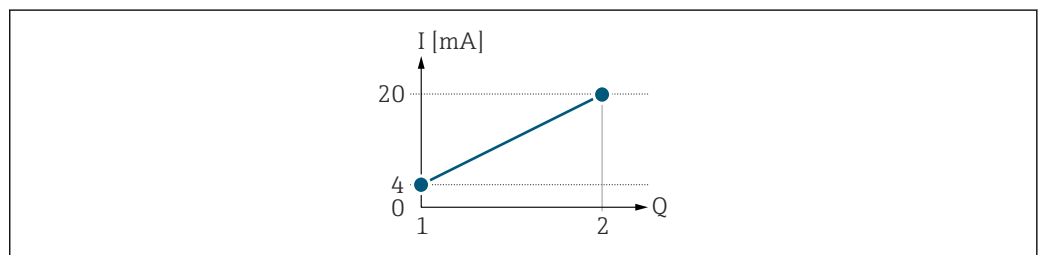
The current output signal is proportional to the measured value for the process variable assigned.

Additional information:

- The lower limit value ("Lower range value output " parameter) and the upper limit value ("Upper range value output " parameter) of the measured value range do not have to have the same algebraic sign, i.e. the lower limit value can be negative and the upper limit value positive.
- Reverse flow (a measured value below the lower limit value of the measured value range) is stored in a buffer and processed after a maximum delay of 60 s with the next forward flow.
- When the flow exceeds the maximum value or the reverse flow stored in the buffer cannot be processed within approx. 60 s, diagnostic message "441 Current output faulty" is generated.
- This option is used e.g. to compensate intermittent reverse flow, which may occur in connection with positive displacement pumps as a result of wear and tear or high viscosity.
- There is no flow damping with this setting.

1. Examples of the behavior of the current output

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



I Current

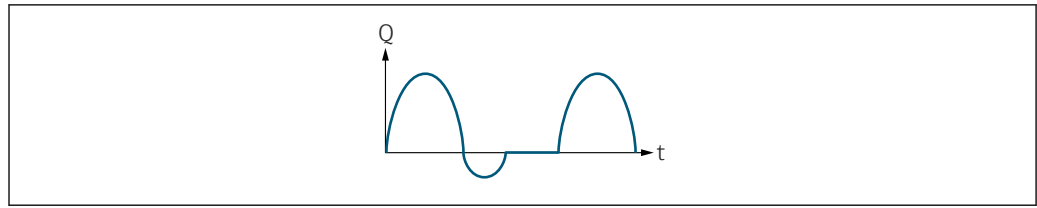
Q Flow

1 Lower range value (value assigned to 0/4 mA current)

2 Upper range value (value assigned to 20 mA current)

A0028084

With the following flow response:

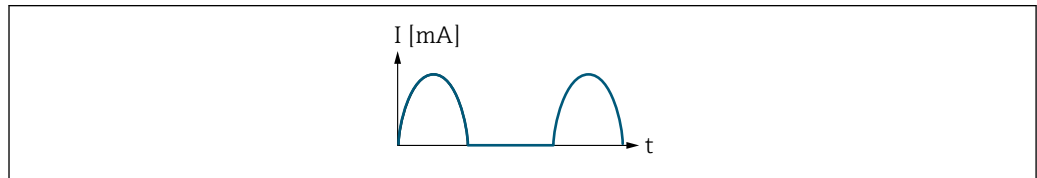


A0028091

Q Flow
 t Time

With the **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:.

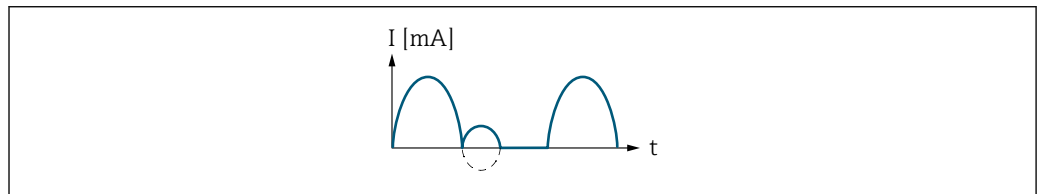


A0028092

I Current
 t Time

With the **Forward/Reverse flow** option

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

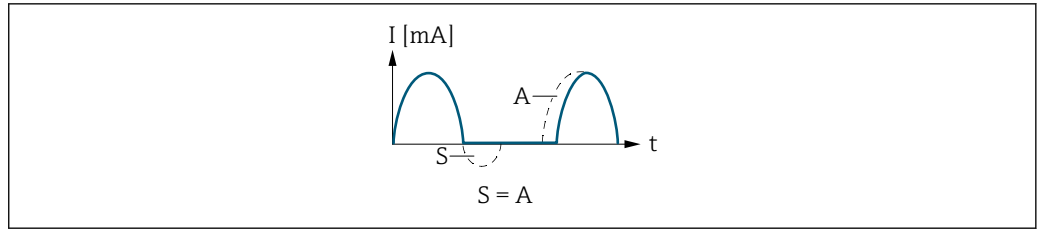


A0028093

I Current
 t Time

With the **Reverse flow compensation** option

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

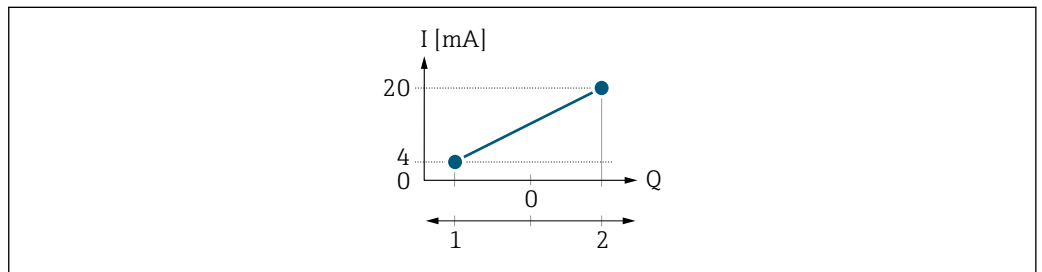


A0028094

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

2. Examples of the behavior of the current output

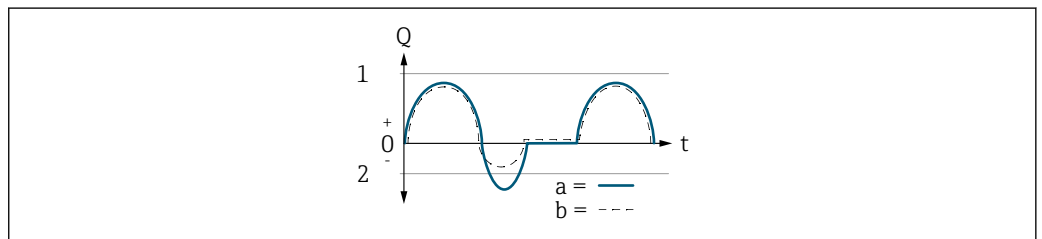
Defined measuring range: lower range value and upper range value with **different** algebraic signs.



A0028095

- 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:

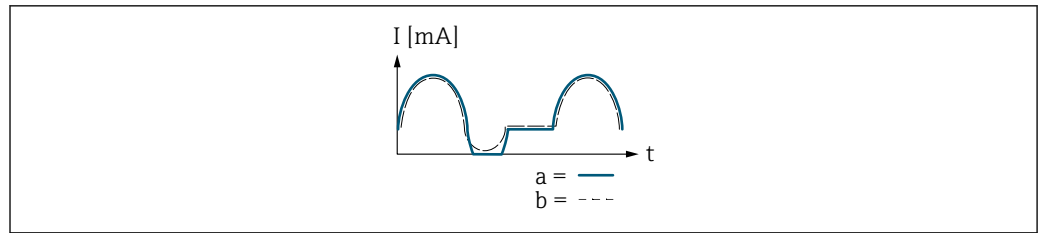


A0028098

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

With the **Forward flow** option

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



A0028100

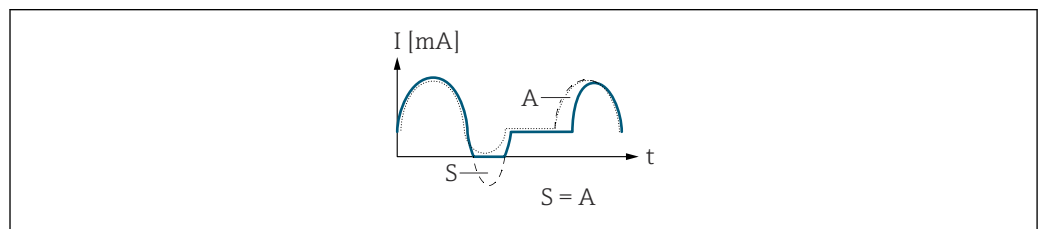
I Current
t Time

With the **Forward/Reverse flow** option

This option cannot be selected here since the values for the **20 mA value** parameter (→ 23) and **20 mA value** parameter (→ 23) have different algebraic signs.

With the **Reverse flow compensation** option

Flow components outside the measuring range 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

Current range output



Navigation

Application → Curr.output 1 → Curr.range out

Description

Select the current range for the measured value output and the upper and lower fault condition signal level.

Additional information:

- The measured value range is specified in the "Lower range value output" parameter and the "Upper range value output" parameter.
- If the measured value lies outside the scaled measured value range, diagnostic message "441 Current output faulty" is generated.
- In the event of a device alarm, the current output adopts the behavior specified in the "Failure behavior current output" parameter.

Selection

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

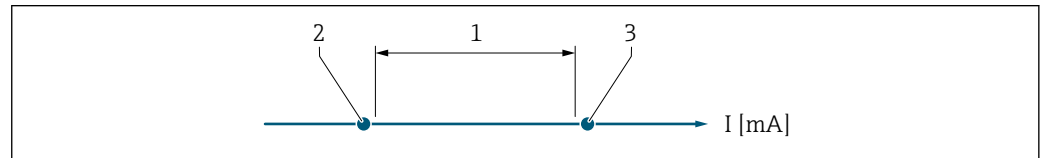
Additional information

Selection

- **4...20 mA NE (3.8...20.5 mA)** option
Select this option to set the current range in accordance with NAMUR recommendation NE43.
- **Fixed value** option
Select this option to set the current output to a current value instead of a range.

The current value is defined in the **Fixed current** parameter (→ 24).

The graphic shows the relationship between the current range for the output of the process value and the lower and upper alarm levels:



A0034351

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

Selection (current range for process value)	Lower level for signal on alarm	Upper level for signal on alarm
4...20 mA NE (3.8...20.5 mA)	< 3.6 mA	> 21.5 mA
4...20 mA US (3.9...20.8 mA)		
4...20 mA (4... 20.5 mA)		

Fixed current



Navigation

Application → Curr.output 1 → Fixed current

Prerequisite

In the **Current range output** parameter in the **Current output 1** submenu, the **Fixed value** option is selected.

Description

Enter the value for the "Fixed value" option.

User entry

3.59 to 21.5 mA

Lower range value output



Navigation

Application → Curr.output 1 → Low.range outp

Prerequisite

In the **Current range output** parameter, one of the following options is selected:

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

Description

Enter lower range value for the measured value range.

Additional information:

- Depending on the setting selected for the "Measuring mode current output" parameter, the value specified for this parameter and the "Upper range value output" parameter must have the same algebraic sign or not.
- As a rule, the lower range value is scaled to be lower than the upper range value. As a result, the behavior of the current output is proportional to the process variable assigned. If the lower range value is scaled to be higher than the upper range value, then the behavior of the current output will be inversely proportional to the process variable assigned.



User entry

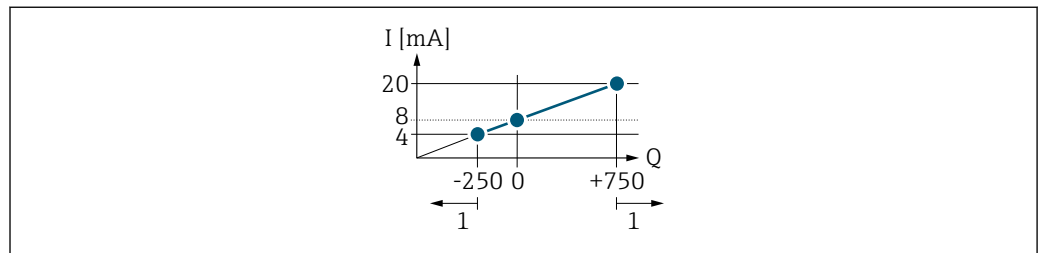
Signed floating-point number

Additional information

Examples of the behavior, depending on the option selected in the **Measuring mode current output** parameter (→  96).



Example: Measuring mode with "Forward flow" option

- **Lower range value output** parameter (→  22) = not equal to zero flow (e.g. -250 m³/h)
- **Upper range value output** parameter (→  23) = not equal to zero flow (e.g. +750 m³/h)
- Calculated current value = 8 mA at zero flow

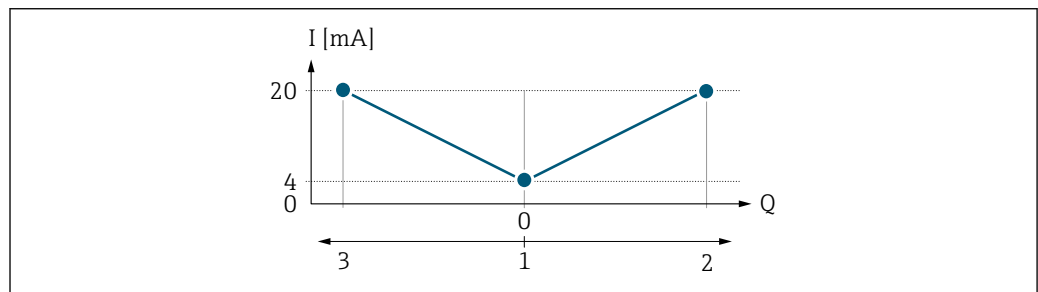


A0013757

- Q Flow
- I Current
- 1 Measuring range is exceeded or undershot



The linear operational range of the measuring device is defined by the values entered for the **Lower range value output** parameter (→  22) and **Upper range value output** parameter (→  23), and by the selected current range.



Example: Measuring mode with the "Forward/Reverse flow" option



A0013758

- Q Flow
- I Current
- 1 Value assigned to 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 **Lower range value output** parameter (→  22) and **Upper range value output** parameter (→  23) must have the same algebraic sign.

The value for the **Upper range value output** parameter (→  23) (e.g. reverse flow) corresponds to the mirrored value for the **Upper range value output** parameter (→  23) (e.g. forward flow).



Example: Measuring mode with the "Reverse flow compensation" option







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

Upper range value output


Navigation	  Application → Curr.output 1 → Upp.range outp
Prerequisite	In the Current range output parameter, one of the following options is selected: <ul style="list-style-type: none"> ■ 4...20 mA NE (3.8...20.5 mA) ■ 4...20 mA US (3.9...20.8 mA) ■ 4...20 mA (4... 20.5 mA)
Description	Enter upper range value for the measured value range.
User entry	Signed floating-point number
Additional information	 Examples of the behavior, depending on the option selected in the Measuring mode current output parameter: Lower range value output parameter (→  22):

Damping current output

Navigation	  Application → Curr.output 1 → Damp.curr.outp
Prerequisite	A process variable is selected in the Process variable current output parameter and one of the following options is selected in the Current range output parameter: <ul style="list-style-type: none"> ■ 4...20 mA NE (3.8...20.5 mA) ■ 4...20 mA US (3.9...20.8 mA) ■ 4...20 mA (4... 20.5 mA)
Description	Enter time constant (PT1 element) to set the reaction time of the output signal to fluctuations in the measured value caused by process conditions. Additional information: <ul style="list-style-type: none"> - The smaller the time constant the faster the output reacts to fluctuations in the measured value. - If the time constant is 0, damping is deactivated.
User entry	0.0 to 999.9 s

Failure behavior current output 	
Navigation	  Application → Curr.output 1 → Fail.behav.out
Prerequisite	A process variable is selected in the Process variable current output parameter and one of the following options is selected in the Current range output parameter: <ul style="list-style-type: none"> ■ 4...20 mA NE (3.8...20.5 mA) ■ 4...20 mA US (3.9...20.8 mA) ■ 4...20 mA (4... 20.5 mA)
Description	Specify how the output should behave in the event of a device alarm.
Selection	<ul style="list-style-type: none"> ■ Min. ■ Max. ■ Last valid value ■ Actual value ■ Fixed value
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Min. option The current output outputs the lower fault condition signal level for the specified current range. Additional information: The current range is specified in the "Current range output " parameter. ■ Max. option The current output outputs the upper fault condition signal level for the specified current range. Additional information: The current range is specified in the "Current range output " parameter. ■ Last valid value option The current output outputs the last valid value measured before the device alarm occurred. ■ Actual value option The current output outputs the flow value currently measured. The device alarm is ignored. ■ Fixed value option The current output outputs the value specified. Additional information: The value is specified in the "Failure current " parameter.
Failure current 	
Navigation	  Application → Curr.output 1 → Fail. current
Prerequisite	In the Failure behavior current output parameter in the Current output 1 submenu, the Fixed value option is selected.
Description	Enter the value for the "Fixed value" option in the "Failure behavior current output " parameter.
User entry	3.59 to 21.5 mA





















Output current










Navigation	 Application → Curr.output 1 → Output curr. 1
Description	Displays the current value currently calculated.
User interface	3.59 to 21.5 mA

4.6 "Pulse/frequency/switch output 1" submenu

Configuring the pulse/frequency/switch output


Navigation  Application → PFS output 1

► Pulse/frequency/switch output 1	
Operating mode	→  107
Assign pulse output 1	→  109
Measuring mode	→  110
Value per pulse	→  110
Pulse width	→  111
Failure mode	→  111
Pulse output 1	→  112
Assign frequency output	→  113
Measuring mode	→  113
Minimum frequency value	→  114
Maximum frequency value	→  115
Measuring value at minimum frequency	→  115
Measuring value at maximum frequency	→  115
Damping output 1	→  116
Failure mode	→  116
Failure frequency	→  116
Output frequency 1	→  117
Switch output function	→  117
Assign diagnostic behavior	→  118
Assign limit	→  118

Switch-on value	→  120
Switch-off value	→  121
Switch-on delay	→  121
Switch-off delay	→  121
Assign flow direction check	→  121
Assign status	→  122
Failure mode	→  122
Invert output signal	→  123
Switch state 1	→  123

Operating mode

Navigation

  Application → PFS output 1 → Operating mode

Description

Select the operating mode for the output.

Selection

- Pulse
- Frequency
- Switch

Additional information*Selection*

- **Pulse option**

Quantitatively proportional pulse with pulse width to be configured. Whenever the pulse value for the specified process variable has been reached, a pulse is emitted, the duration of which is set within the "Pulse width" parameter.

Additional information:

The process variable for the pulse output is specified in the "Assign pulse output" parameter.

- **Frequency option**

The output frequency is proportional to the value for the process variable assigned, with a pulse-to-interval ratio of 1:1.

Additional information:

The process variable for the frequency output is specified in the "Assign frequency output" parameter.

- **Switch option**

Indicates when the state of the device changes, e.g. when a specified limit value is reached or an alarm or warning is triggered.

Additional information:

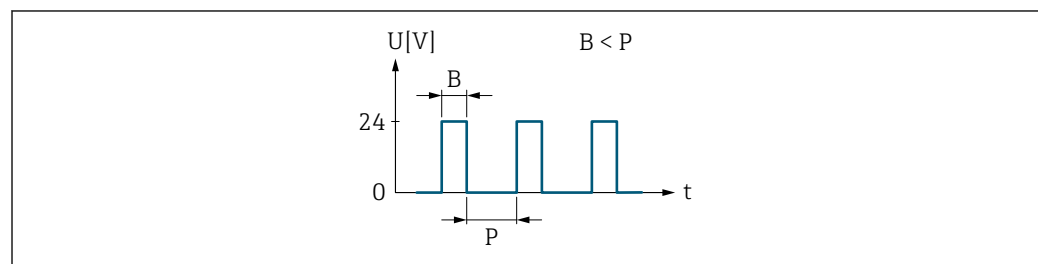
- The switch output can be in one of two states: either it is conductive or it is non-conductive.

- When the function assigned to the switch output is triggered, the switch output will depending on the output configuration either be continuously conductive or continuously non-conductive.

- The switch output is used to display diagnostic information at the system level, e.g. by connecting a lamp that lights up when the function assigned is triggered.

*"Pulse" option***Example**

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



A0026883

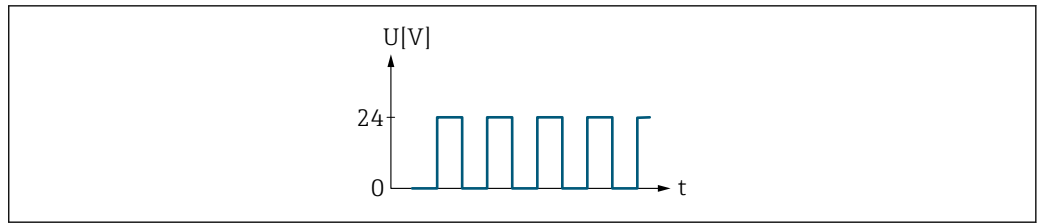
5 Quantity-proportional pulse (pulse value) with pulse width to be configured

B Pulse width entered

P Pauses between the individual pulses

*"Frequency" option***Example**

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



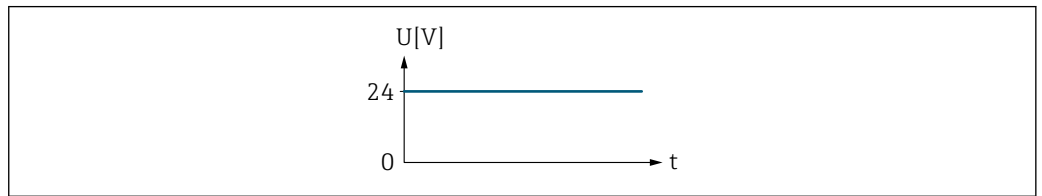
A0026886

6 Flow-proportional frequency output

"Switch" option

Example

Alarm response without alarm

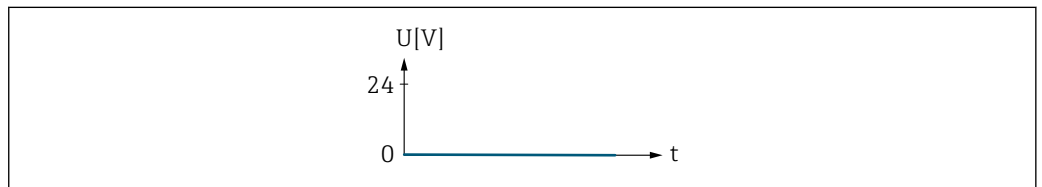


A0026884

7 No alarm, high level

Example

Alarm response in case of alarm



A0026885

8 Alarm, low level

Assign pulse output 1



Navigation

Application → PFS output 1 → Assign pulse 1

Prerequisite




In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Pulse** option is selected.




Description

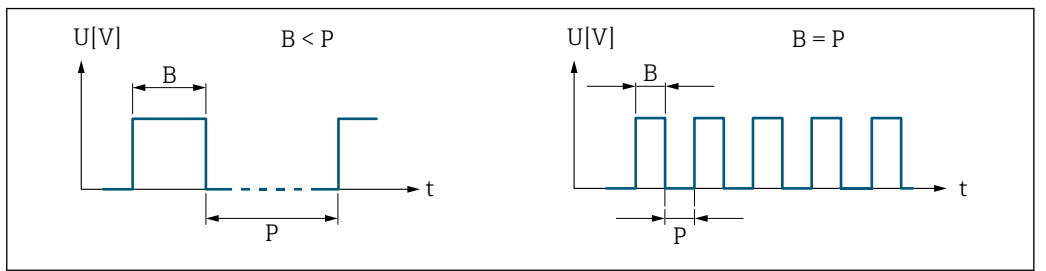
Select process variable for pulse output.

Selection

- Off
- Volume flow
- Mass flow

Measuring mode 	
Navigation	  Application → PFS output 1 → Measuring mode
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Pulse option is selected.
Description	Select measuring mode for pulse output.
Selection	<ul style="list-style-type: none"> ▪ Forward flow ▪ Forward/Reverse flow ▪ Reverse flow ▪ Reverse flow compensation
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ▪ Forward flow option Positive flow is output, negative flow not output. ▪ Forward/Reverse flow option Both positive and negative flow are output (absolute value), whereby no distinction is made between positive and negative flow. ▪ Reverse flow option Negative flow is output, positive flow is not output. ▪ Reverse flow compensation option Positive flow is output. Negative flow quantities are buffered, processed, and output after a maximum delay of 60 s. Additional information: This option is used e.g. to compensate intermittent negative flow, which may occur in connection with positive displacement pumps as a result of wear and tear or high viscosity.

Value per pulse 	
Navigation	  Application → PFS output 1 → Value per pulse
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Pulse option is selected.
Description	<p>Enter the measured value to which a pulse corresponds.</p> <p>Additional information: Weighting of the pulse output with a quantity. The lower the pulse value, the</p> <ul style="list-style-type: none"> – better the resolution. – higher the frequency of the pulse response.
User entry	Signed floating-point number

Pulse width	🔒
Navigation	🏠📁 Application → PFS output 1 → Pulse width
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Pulse option is selected.
Description	<p>Specify the duration of the output pulse.</p> <p>Additional information: The maximum pulse rate is defined by $f_{max} = 1 / (2 \times \text{pulse width})$. The interval between two pulses (P) is at least as long as the specified pulse width (B). 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 "443 Pulse output faulty".</p> <p>Example: - Pulse value: 0.1 g - Pulse width: 0.1 ms - $f_{max}: 1 / (2 \times 0.1 \text{ ms}) = 5 \text{ kHz}$ - $Q_{max}: 5 \text{ kHz} \times 0.1 \text{ g} = 0.5 \text{ kg/s}$</p>
User entry	0.05 to 2 000 ms
Additional information	<p><i>Description</i></p>  <p><i>B Pulse width entered</i> <i>P Pauses between the individual pulses</i></p> <p style="text-align: right;"><small>A0026882</small></p>

Failure mode	🔒
Navigation	🏠📁 Application → PFS output 1 → Failure mode
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Pulse option is selected.
Description	<p>Specify how the output should behave in the event of a device alarm.</p> <p>Additional information: For safety reasons, it is recommended that the behavior of the output in the event of a device alarm be predefined.</p>
Selection	<ul style="list-style-type: none"> ■ Actual value ■ No pulses

Additional information*Selection*

- **Actual value** option

In the event of a device alarm, the pulse output continues based on the current flow measurement. The issue is ignored.

Additional information:

A device alarm indicates a serious malfunction of the measuring device that may impact the measurement quality to the point that accuracy can no longer be ensured. This option is only recommended if the necessary safeguards are in place to ensure that no alarm condition can impact the measurement quality.

- **No pulses** option

In the event of a device alarm, no pulses are emitted.

Pulse output 1**Navigation**

☰☰ Application → PFS output 1 → Pulse output 1

Prerequisite

In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Pulse** option is selected.

Description

Displays the pulse frequency currently output.

Additional information:

- The output behavior can be inverted in the "Invert output signal" parameter, i.e. in this case the transistor will be non-conductive for the duration of a pulse.

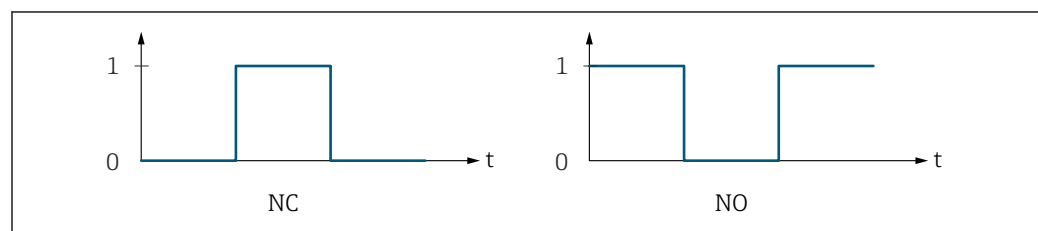
- The "Invert output signal" parameter is not available for all devices.

User interface

Positive floating-point number

Additional information*Description*

- The pulse output is an open collector output.
- This is configured at the factory in such a way that the transistor is conductive for the duration of the pulse (NO contact) and is safety-oriented.





A0028726

0 Non-conductive

1 Conductive

NC Normally closed

NO Normally open

 The behavior of the output in the event of a device alarm can be configured: **Failure mode** parameter (→  111)

Assign frequency output

**Navigation**

Application → PFS output 1 → Assign freq.

Prerequisite

In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Frequency** option is selected.

Description

Select process variable for frequency output.

Selection

- Off
- Volume flow
- Mass flow
- Conductivity *
- Corrected conductivity *
- Temperature *
- Noise *
- Coil current shot time *

Measuring mode

**Navigation**

Application → PFS output 1 → Measuring mode

Prerequisite

In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Frequency** option is selected.

Description

Select measuring mode for frequency output.

Selection

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

* Visibility depends on order options or device settings

Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> <p>■ Forward flow option</p> <p>The output signal is proportional to the measured value for the process variable assigned.</p> <p>Additional information:</p> <ul style="list-style-type: none"> - The lower limit value ("Measuring value at minimum frequency" parameter) and the upper limit value ("Measuring value at maximum frequency" parameter) of the measured value range do not have to have the same algebraic sign, i.e. the lower limit value can be negative and the upper limit value positive. - If the measured value lies outside the scaled measured value range, diagnostic message "442 Frequency output faulty" is generated. <p>■ Forward/Reverse flow option</p> <p>The output outputs the absolute value for the assigned process variable (reflection across the lower limit value of the measured value range).</p> <p>Additional information:</p> <ul style="list-style-type: none"> - The lower limit value ("Measuring value at minimum frequency" parameter) and the upper limit value ("Measuring value at maximum frequency" parameter) of the measured value range must have the same algebraic sign. - If the absolute value exceeds the upper limit value of the measured value range, diagnostic message "442 Frequency output faulty" is generated. - This setting is generally used for flow-related process variables. <p>■ Reverse flow compensation option</p> <p>The output signal is proportional to the measured value for the process variable assigned.</p> <p>Additional information:</p> <ul style="list-style-type: none"> - The lower limit value ("Measuring value at minimum frequency" parameter) and the upper limit value ("Measuring value at maximum frequency" parameter) of the measured value range do not have to have the same algebraic sign, i.e. the lower limit value can be negative and the upper limit value positive. - Reverse flow (a measured value below the lower limit value of the measured value range) is stored in a buffer and processed after a maximum delay of 60 s with the next forward flow. - When the flow exceeds the maximum value or the reverse flow stored in the buffer cannot be processed within approx. 60 s, diagnostic message "442 Frequency output faulty" is generated. - This option is used e.g. to compensate intermittent reverse flow, which may occur in connection with positive displacement pumps as a result of wear and tear or high viscosity. - There is no flow damping with this setting.
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Minimum frequency value


Navigation	Application → PFS output 1 → Min. freq. value
Prerequisite	<p>In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Frequency option is selected.</p>
Description	<p>Enter the minimum frequency for the frequency range.</p> <p>Additional information:</p> <p>The lower range value for the measured value range is specified in the "Measuring value at minimum frequency" parameter.</p>
User entry	0.0 to 10 000.0 Hz

Maximum frequency value



Navigation	Application → PFS output 1 → Max. freq. value
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Frequency option is selected.
Description	Enter the maximum frequency for the measured value output. Additional information: The upper range value for the measured value range that corresponds to the maximum frequency is specified in the "Measuring value at maximum frequency" parameter.
User entry	0.0 to 10 000.0 Hz

Measuring value at minimum frequency









Navigation	Application → PFS output 1 → Val. at min.freq
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Frequency option is selected.
Description	Enter lower range value for the measured value range. Additional information: - Depending on the setting selected for the "Measuring mode" parameter, the value specified for this parameter and the "Measuring value at maximum frequency" parameter must have the same algebraic sign or not. - As a rule, the lower range value is scaled to be lower than the upper range value. As a result, the behavior of the frequency output is proportional to the process variable assigned. If the lower range value is scaled to be higher than the upper range value, then the behavior of the frequency output will be inversely proportional to the process variable assigned.
User entry	Signed floating-point number




Measuring value at maximum frequency



Navigation	Application → PFS output 1 → Val. at max.freq
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Frequency option is selected.
Description	Enter upper range value for the measured value range.
User entry	Signed floating-point number


Damping output 1		
Navigation	  Application → PFS output 1 → Damping out. 1	
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Frequency option is selected.	
Description	<p>Enter time constant (PT1 element) to set the reaction time of the output signal to fluctuations in the measured value caused by process conditions.</p> <p>Additional information:</p> <ul style="list-style-type: none"> - The smaller the time constant the faster the output reacts to fluctuations in the measured value. - If the time constant is 0, damping is deactivated. 	
User entry	0 to 999.9 s	

Failure mode		
Navigation	  Application → PFS output 1 → Failure mode	
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Frequency option is selected.	
Description	<p>Specify how the output should behave in the event of a device alarm.</p> <p>Additional information:</p> <p>For safety reasons, it is recommended that the behavior of the output in the event of a device alarm be predefined.</p>	
Selection	<ul style="list-style-type: none"> ■ Actual value ■ Defined value ■ 0 Hz 	
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Actual value option The frequency output outputs the flow value currently measured. ■ Defined value option The frequency output outputs the value specified. Additional information: The value is specified in the "Failure frequency" parameter. ■ 0 Hz option In the event of a device alarm, the frequency output outputs 0 Hz. 	


Failure frequency		
Navigation	  Application → PFS output 1 → Failure freq.	
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Frequency option is selected.	

Description	Enter the value for the "Defined value" option in the "Failure mode" parameter.
User entry	0.0 to 12 500.0 Hz

Output frequency 1



Navigation	 Application → PFS output 1 → Output freq. 1
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Frequency option is selected.
Description	Displays the pulse frequency currently output.
User interface	0.0 to 12 500.0 Hz

Switch output function



Navigation	 Application → PFS output 1 → Switch out funct
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Switch option is selected.
Description	Assign a function to the switch output. Additional information: - The state of the switch output (on or off) when the assigned function is triggered can be inverted in the "Invert output signal" parameter - The "Invert output signal" parameter is not available for all devices.
Selection	<ul style="list-style-type: none"> ▪ Off ▪ On ▪ Diagnostic behavior ▪ Limit ▪ Flow direction check ▪ Status
Additional information	<i>Selection</i> <ul style="list-style-type: none"> ▪ Off option The switch output is permanently switched off (open, non-conductive). ▪ On option The switch output is permanently switched on (closed, conductive). ▪ Diagnostic behavior option The switch output is switched on (closed, conductive), if there is a pending diagnostic event of the assigned behavioral category.

- **Limit** option
The switch output is switched on (closed, conductive), if a limit value specified for the process variable is reached.
- **Flow direction check** option
The switch output is switched on (closed, conductive), when the flow direction changes (forward or reverse flow).
- **Status** option
The switch output is switched on (closed, conductive) to indicate the device status for the selected detection method, e.g. empty pipe detection or low flow cut off.

Assign diagnostic behavior

Navigation	  Application → PFS output 1 → Assign diag. beh
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Switch option is selected.
Description	The switch output is switched on (closed, conductive), if there is a pending diagnostic event of the assigned behavioral category.
Selection	<ul style="list-style-type: none"> ■ Alarm ■ Alarm or warning ■ Warning
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ Alarm option The switch output is only switched on for diagnostic events of the "Alarm" category. ■ Alarm or warning option The switch output is switched on for diagnostic events of the "Alarm" or "Warning" category. ■ Warning option The switch output is only switched on for diagnostic events of the "Warning" category.

Assign limit

Navigation	  Application → PFS output 1 → Assign limit
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Switch option is selected.
Description	Select the process variable to monitor in case the specified limit value is exceeded. If a limit value for the selected process variable is exceeded, the output is switched on.
Selection	<ul style="list-style-type: none"> ■ Off ■ Volume flow ■ Mass flow ■ Flow velocity* ■ Conductivity*

* Visibility depends on order options or device settings

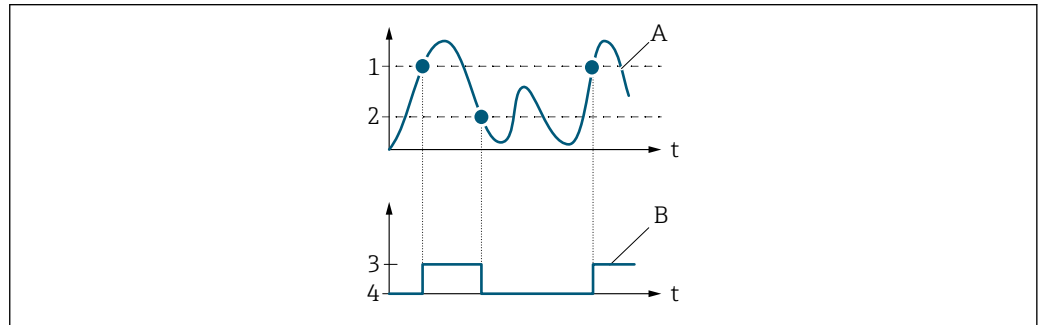
- Corrected conductivity *
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Temperature *
- Sensor electronics temperature (ISEM)

Additional information

Switch-on point > switch-off point

Behavior of the status output if switch-on point > switch-off point:

- Process variable > switch-on point: transistor is conductive
- Process variable < switch-off point: transistor is not conductive



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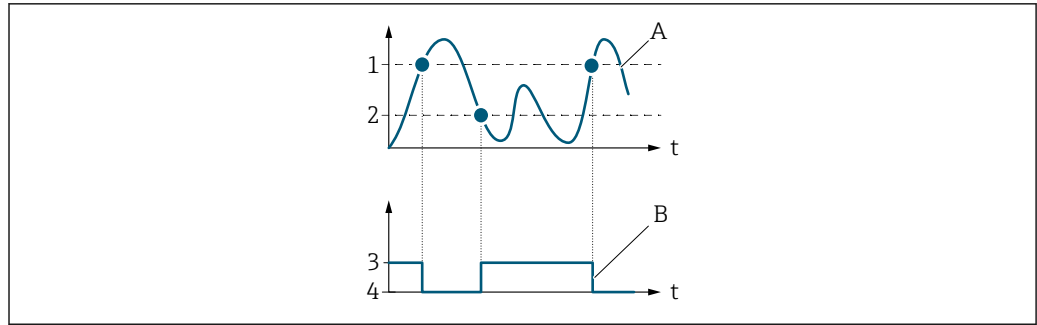
- 1 Switch-on point
- 2 Switch-off point
- 3 Conductive
- 4 Non-conductive
- A Process variable
- B Status output

Switch-on point < switch-off point

Behavior of the status output if switch-on point < switch-off point:

- Process variable < switch-on point: transistor is conductive
- Process variable > switch-off point: transistor is not conductive

* Visibility depends on order options or device settings



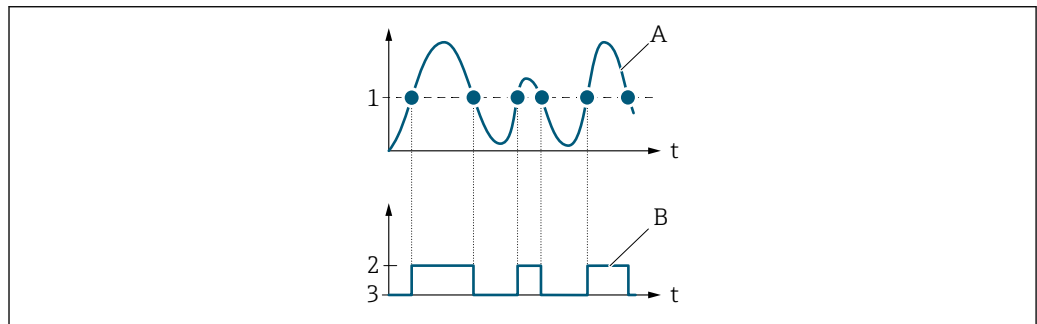
A0026892

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

Switch-on point = switch-off point

Behavior of the status output if switch-on point = switch-off point:

- Process variable > switch-on point: transistor is conductive
- Process variable < switch-off point: transistor is not conductive



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

Switch-on value



Navigation

Application → PFS output 1 → Switch-on value

Prerequisite

In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Switch** option is selected.

Description













Enter limit value for the switch-on point (process variable > switch-on value = closed, conductive).

Additional information:

To use a hysteresis: Switch-on point > Switch-off point.

User entry

Signed floating-point number

Switch-off value 	
Navigation	  Application → PFS output 1 → Switch-off value
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Switch option is selected.
Description	Enter limit value for the switch-off point (process variable < switch-off value = open, non-conductive). Additional information: To use a hysteresis: Switch-on point > Switch-off point.
User entry	Signed floating-point number
Switch-on delay 	
Navigation	  Application → PFS output 1 → Switch-on delay
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Switch option is selected.
Description	Enter delay before the switch output is switched on.
User entry	0.0 to 100.0 s
Switch-off delay 	
Navigation	  Application → PFS output 1 → Switch-off delay
Prerequisite	In the Operating mode parameter in the Pulse/frequency/switch output 1 submenu, the Switch option is selected.
Description	Enter delay before the switch output is switched off.
User entry	0.0 to 100.0 s
Assign flow direction check 	
Navigation	  Application → PFS output 1 → Assign dir.check
Prerequisite	In the Switch output function parameter in the Pulse/frequency/switch output 1 submenu, the Frequency option is selected.
Description	Select process variable for flow direction monitoring.

- Selection**
- Off
 - Volume flow
 - Mass flow

Assign status

Navigation   Application → PFS output 1 → Assign status

Prerequisite In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Switch** option is selected.

Description Select the device status to display for the switch output.
 Additional information:
 If the switch on point for the selected detection method is reached, the output is conductive. Otherwise, the switch output is non-conductive.

- Selection**
- Empty pipe detection
 - Low flow cut off

Failure mode

Navigation   Application → PFS output 1 → Failure mode

Prerequisite In the **Operating mode** parameter in the **Pulse/frequency/switch output 1** submenu, the **Switch** option is selected.

Description Specify how the output should behave in the event of a device alarm.
 Additional information:
 For safety reasons, it is recommended that the behavior of the output in the event of a device alarm be predefined.

- Selection**
- Actual status
 - Open
 - Closed

Additional information *Selection*

- **Actual status** option
 In the event of a device alarm, the issue is ignored and the switch output adopts the behavior currently specified for the "Switch output function" parameter.
- **Open** option
 In the event of a device alarm, the switch output's transistor is set to "non-conductive".

Invert output signal
**Navigation**

Application → PFS output 1 → Invert outp.sig.

Description

Indicate whether to invert the output signal (Yes/No).

Additional information:

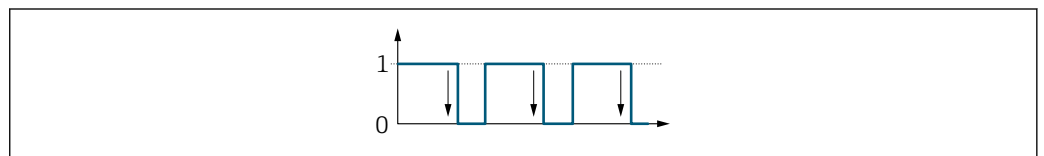
- If the output signal is inverted, the output behavior is the reverse of its configuration.
- This setting does not apply to the frequency output.

Selection

- No
- Yes

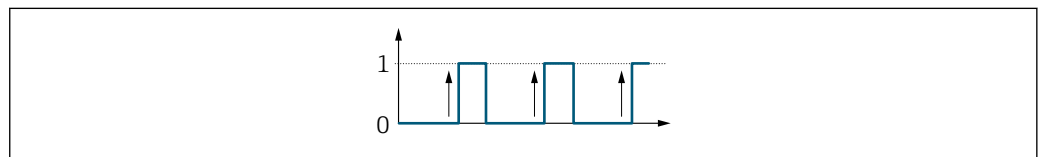
Additional information

Selection: no (passive - negative)



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Selection: yes (passive - positive)



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Switch state 1
Navigation

Application → PFS output 1 → Switch state 1

Description

Indicates the current switch output status.

User interface

- Open
- Closed




Additional information

User interface


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




4.7 "Communication" submenu

Navigation  Application → Communication


▶ Communication	
▶ HART configuration	→  124
▶ Information	→  125
▶ Output	→  127

4.7.1 "HART configuration" submenu

Navigation  Application → Communication → HART config.

▶ HART configuration	
HART short tag	→  124
Device tag	→  124
HART address	→  125


HART short tag

Navigation  Application → Communication → HART config. → HART short tag

Description Enter a brief description for the measuring point.

User entry Character string comprising numbers, letters and special characters (#8)

Device tag

Navigation  Application → Communication → HART config. → Device tag

Description Enter a unique name for the measuring point to identify the device quickly within the plant.

User entry Character string comprising numbers, letters and special characters (#32)

HART address

Navigation	Application → Communication → HART config. → HART address
Description	Enter the address to exchange data via the HART protocol.
User entry	0 to 63

4.7.2 "Information" submenu



Navigation Application → Communication → Information

▶ Information	
Device revision	→ 125
Device ID	→ 126
Device type	→ 126
Manufacturer ID	→ 126
HART revision	→ 126
HART descriptor	→ 126
HART message	→ 127
Hardware revision	→ 127
Software revision	→ 127
HART date code	→ 127

Device revision

Navigation	Application → Communication → Information → Device revision
Description	Displays device revision.
User interface	0 to 255



Device ID 

Navigation   Application → Communication → Information → Device ID

Description Displays the device ID to identify the measuring device.

User interface Positive integer



Device type

Navigation   Application → Communication → Information → Device type

Description Displays the device type registered with the HART Communication Foundation.

User interface 0 to 65 535



Manufacturer ID

Navigation   Application → Communication → Information → Manufacturer ID

Description Displays the manufacturer ID registered with the HART Communication Foundation.

User interface 0 to 65 535



HART revision

Navigation   Application → Communication → Information → HART revision

Description Displays the HART protocol revision of the measuring device.

User interface 5 to 7

HART descriptor 

Navigation   Application → Communication → Information → HART descriptor

Description Enter description for the measuring point

User entry Character string comprising numbers, letters and special characters (#16)

HART message

**Navigation**

Application → Communication → Information → HART message

Description

Enter HART message to be sent via HART protocol when requested by the master.

User entry

Character string comprising numbers, letters and special characters (#32)

Hardware revision

Navigation

Application → Communication → Information → Hardware rev.

Description

Displays the hardware revision of the measuring device.

User interface

0 to 255

Software revision

Navigation

Application → Communication → Information → Software rev.

Description

Displays software revision of the measuring device.

User interface

0 to 255

HART date code

**Navigation**

Application → Communication → Information → HART date code

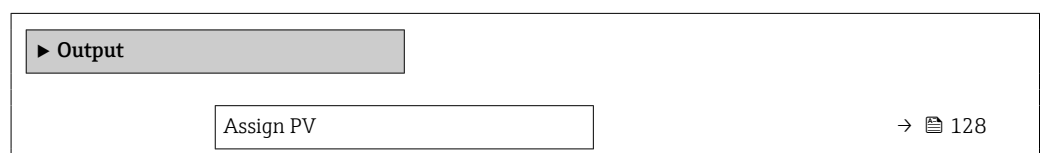
Description








Enter date for individual use.

User entry

Character string comprising numbers, letters and special characters (#10)



4.7.3 "Output" submenu

Navigation Application → Communication → Output

Primary variable (PV)	→  128
Assign SV	→  129
Secondary variable (SV)	→  129
Assign TV	→  129
Tertiary variable (TV)	→  130
Assign QV	→  130
Quaternary variable (QV)	→  130

Assign PV

Navigation

  Application → Communication → Output → Assign PV

Description

Assign a measured variable to the primary dynamic variable (PV).

Additional information:



The assigned measured variable is also used by the current output.

Selection

- Off *
- Mass flow
- Conductivity *
- Corrected conductivity *
- Volume flow
- Temperature *
- Noise *
- Coil current shot time *

Primary variable (PV)

Navigation

  Application → Communication → Output → Primary var (PV)

Description

Displays the value currently measured for the primary dynamic variable.

User interface

Signed floating-point number

* Visibility depends on order options or device settings

Assign SV

**Navigation**

Application → Communication → Output → Assign SV

Description

Assign a measured variable to the second dynamic variable (SV).

Selection

- Volume flow
- Mass flow
- Conductivity *
- Corrected conductivity *
- Temperature *
- Noise *
- Coil current shot time *
- Totalizer 1
- Totalizer 2
- Totalizer 3

Secondary variable (SV)

Navigation

Application → Communication → Output → Second.var(SV)

Description

Displays the value currently measured for the secondary dynamic variable.

User interface

Signed floating-point number

Assign TV

**Navigation**

Application → Communication → Output → Assign TV

Description


Assign a measured variable to the tertiary dynamic variable (TV).

Selection

- Volume flow
- Mass flow
- Conductivity *
- Corrected conductivity *
- Temperature *
- Noise *
- Coil current shot time *
- Totalizer 1
- Totalizer 2
- Totalizer 3


* Visibility depends on order options or device settings

Tertiary variable (TV)


Navigation	 Application → Communication → Output → Tertiary var(TV)
Description	Displays the value currently measured for the tertiary dynamic variable.
User interface	Signed floating-point number

Assign QV



Navigation	 Application → Communication → Output → Assign QV
Description	Assign a measured variable to the quaternary dynamic variable (QV).
Selection	<ul style="list-style-type: none"> ■ Volume flow ■ Mass flow ■ Conductivity * ■ Corrected conductivity * ■ Temperature * ■ Noise * ■ Coil current shot time * ■ Totalizer 1 ■ Totalizer 2 ■ Totalizer 3

Quaternary variable (QV)








Navigation	 Application → Communication → Output → Quaterna.var(QV)
Description	Displays the value currently measured for the quaternary dynamic variable.
User interface	Signed floating-point number

* Visibility depends on order options or device settings

5 "System" menu





Overall device management and security settings – management of system settings and adaption to operational requirements.

Navigation  System


System	
▶ Device management	→  132
▶ User management	→  135
▶ Connectivity	→  138
▶ Date/time	→  139
▶ Information	→  141
▶ Display	→  146
▶ Software configuration	→  150

5.1 "Device management" submenu

Navigation  System → Device manag.

▶ Device management	
Device tag	→  132
Locking status	→  132
Configuration counter	→  133
Device reset	→  133

Device tag

Navigation  System → Device manag. → Device tag

Description Enter a unique name for the measuring point to identify the device quickly within the plant.

User entry Character string comprising numbers, letters and special characters (#32)

Locking status

Navigation  System → Device manag. → Locking status

Description Indicates the write protection with the highest priority that is currently active.


User interface

- Hardware locked
- Temporarily locked


Additional information *User interface*


- **Hardware locked** option
The DIP switch for the hardware lock is enabled. As a result write access to the parameters is locked.
- **Temporarily locked** option
Due to internal procedures that are currently in progress (e.g. data upload/download, reset, etc.), write access to the parameters is temporarily locked. The parameters can be modified again, once the internal procedures are complete.

Configuration counter

Navigation	 System → Device manag. → Config. counter
Description	<p>Displays the counter for changes to the device parameters.</p> <p>Additional information:</p> <ul style="list-style-type: none"> - If the value for a static parameter is changed when optimizing or configuring the parameter, the counter is incremented by 1. This is to enable tracking different parameter versions. - When multiple parameters are changed simultaneously, e.g. when loading parameters into the device from an external source such as FieldCare, the counter may display a higher value. The counter cannot be reset, nor is it reset to a default value on performing a device reset. - Once the counter has reached the value 65535, it restarts at 0.
User interface	0 to 65 535

Device reset







Navigation	 System → Device manag. → Device reset
Description	Reset the device configuration - either entirely or in part - to a defined state.
Selection	<ul style="list-style-type: none"> ■ Cancel ■ To delivery settings ■ Restart device ■ Restore S-DAT backup * ■ Create T-DAT backup ■ Restore T-DAT backup *
Additional information	<p><i>Selection</i></p> <ul style="list-style-type: none"> ■ To delivery settings option Every parameter for which a customer-specific default setting was ordered is reset to the customer-specific value. All other parameters are reset to the factory setting. ■ Restart device option The restart resets every parameter with data stored in volatile memory (RAM) to the factory setting (e.g. measured value data). The device configuration remains unchanged. ■ Delete powerfail data option Deletes the powerfail data segment in the T-DAT or (if applicable) the T-DAT partition of the S-DAT. Additional information: This function resolves the following memory content error: "283 Memory content inconsistent" with Service ID 225 and Service ID 721.

* Visibility depends on order options or device settings

- **Delete T-DAT** option
Deletes the T-DAT or (if applicable) the T-DAT partition of the S-DAT. On performing this delete operation, all parameters on the T-DAT are reset to the default values.
Additional information:
This function can be used to resolve any memory content issue on the T-DAT.
NOTE
The powerfail data and device delivery settings will no longer be available on performing this delete operation!
- **Delete flash file system** option
Deletes the flash file system.
Additional information:
This function resolves the following memory content error: "387 HistoROM data faulty" with Service ID 648.
NOTE
The menu structure set up for the SmartBlue app and the files used to perform a firmware restore in the event the firmware is corrupted will no longer be available on performing this delete operation!
- **Reset faulty parameters** option
Resets all faulty parameters to default values when the following memory content error occurs: "283 Memory content inconsistent" with Service ID 367.
Additional information:
Only faulty parameters are reset. All parameters that are reset are logged in the logbook.
- **Delete delivery settings** option
Deletes the delivery settings on the T-DAT or (if applicable) T-DAT partition of the S-DAT.
Additional information:
This function resolves the following memory content error: "311 Sensor electronics (ISEM) faulty" with Service ID 226.
NOTE
The device delivery settings will no longer be available on performing this delete operation!
- **Restore S-DAT backup** option
Restore the data that is saved on the S-DAT. The data record is restored from the electronics memory to the S-DAT.
- **Create T-DAT backup** option
Create T-DAT backup.



5.2 "User management" submenu

Navigation   System → User manag.

▶ User management		
User role		→  135
Enter access code		→  136
Reset Maintenance code		→  136
▶ Define Maintenance code		→  137

User role

Navigation

  System → User manag. → User role

Description

Displays the role the user is currently logged on in. The role determines the user's access rights for the parameters.

Additional information:

- Until a Maintenance code has been set in the "Define Maintenance code" parameter, all users are automatically logged on in the Maintenance role. Once the Maintenance code has been set, all users are automatically logged on in the Operator role.
- The access rights can be changed via the "Enter access code" parameter.

User interface

- Operator
- Maintenance
- Service
- Production
- Development

Additional information

User interface

- **Operator** option

Provides only read access to parameters.

- **Maintenance** option

Provides read and write access to parameters.

Additional information:

For some parameters, the user must be logged on in the Service role to obtain write access.

- **Service** option

Provides read and write access to Service parameters.


Enter access code

Navigation System → User manag. → Ent. access code**Description**

For users logged on in the Operator role, enter the Maintenance code to change the access status to Maintenance and disable write protection of parameters. For users logged on in the Maintenance role, enter the Service code to change the access status to Service and enable read and write access to Service parameters.

User entry0 to 9 999

Reset Maintenance code

Navigation System → User manag. → Reset Maint code**Description**


Enter the code provided by Endress+Hauser Technical Support to reset the Maintenance code.



User entry

Character string comprising numbers, letters and special characters (#32)

5.2.1 "Define access code" wizard

Complete this wizard to specify an access code for the Maintenance role.

Navigation  System → User manag. → Def. access code

► Define Maintenance code	
Define Maintenance code	→  137
Confirm Maintenance code	→  137

Define Maintenance code

Navigation

 System → User manag. → Def. Maint. code → Def. Maint. code

Description

Specify an access code that is required to obtain the access rights for the Maintenance role.

User entry

0 to 9999

Confirm Maintenance code

Navigation

 System → User manag. → Def. Maint. code → Conf. Maint code

Description

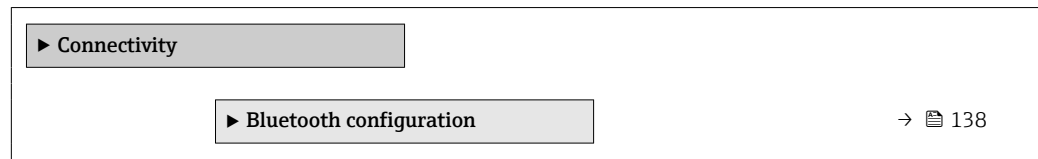
Confirm the access code entered for the Maintenance role.

User entry


0 to 9999

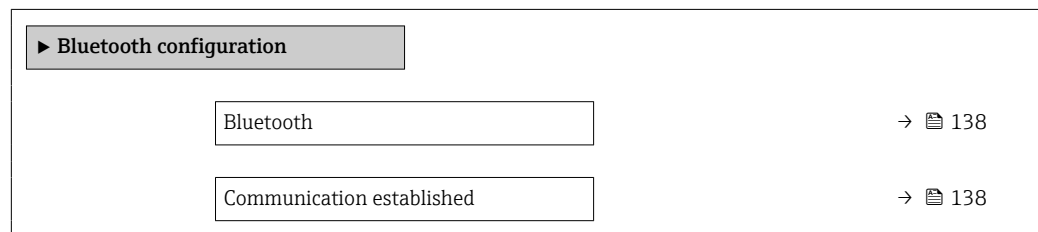
5.3 "Connectivity" submenu

Navigation  System → Connectivity




5.3.1 "Bluetooth configuration" submenu

Navigation  System → Connectivity → Bluetooth conf.



Bluetooth

Navigation  System → Connectivity → Bluetooth conf. → Bluetooth

Description Enable or disable Bluetooth.

- Selection**
- Enable
 - Disable
 - Not available *

Communication established

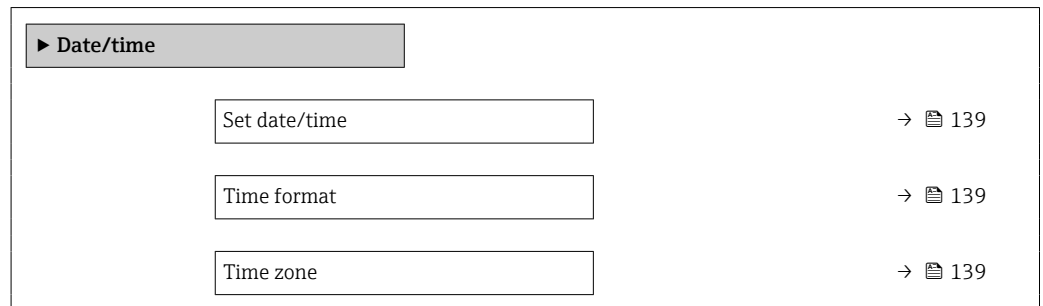
Navigation  System → Connectivity → Bluetooth conf. → Communi. establ.

- User interface**
- No
 - Yes


* Visibility depends on order options or device settings

5.4 "Date / Time" submenu

Navigation   System → Date / Time



Set date/time

Navigation  System → Date/time → Set date/time

Description Set the date and local time. Every time the date or time is changed, a logbook entry is created.

User entry Date and time

Time format

Navigation   System → Date/time → Time format

Description Select time format.

Selection

- 24 h
- 12 h AM/PM

Time zone

Navigation   System → Date/time → Time zone

Description Select the time zone. Every time the time zone is changed, a logbook entry is created.




Selection

Other units

- UTC-12:00
- UTC-11:00
- UTC-10:00
- UTC-09:30
- UTC-09:00
- UTC-08:00
- UTC-07:00
- UTC-06:00
- UTC-05:00
- UTC-04:00
- UTC-03:30
- UTC-03:00
- UTC-02:00
- UTC-01:00
- UTC 00:00
- UTC+01:00
- UTC+02:00
- UTC+03:00
- UTC+03:30
- UTC+04:00
- UTC+04:30
- UTC+05:00
- UTC+05:30
- UTC+05:45
- UTC+06:00
- UTC+06:30
- UTC+07:00
- UTC+08:00
- UTC+08:45
- UTC+09:00
- UTC+09:30
- UTC+10:00
- UTC+10:30
- UTC+11:00
- UTC+12:00
- UTC+12:45
- UTC+13:00
- UTC+14:00











5.5 "Information" submenu

Navigation  System → Information

▶ Information	
▶ Device	→  141
▶ Sensor electronic module (ISEM)	→  144
▶ Display module	→  144

5.5.1 "Device" submenu

Navigation  System → Information → Device

▶ Device	
Device name	→  141
Device tag	→  142
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Firmware version	→  142
Extended order code 1	→  143
Extended order code 2	→  143
Extended order code 3	→  143
ENP version	→  143
Manufacturer	→  144

Device name

Navigation

 System → Information → Device → Device name

Description

Displays the name of the transmitter.

Additional information:

The name can also be found on the transmitter's nameplate.

User interface Character string comprising numbers, letters and special characters (#16)


Device tag

Navigation  System → Information → Device → Device tag

Description Displays the name for the measuring point.

User interface Character string comprising numbers, letters and special characters (#32)

Serial number

Navigation  System → Information → Device → Serial number

Description Displays the serial number of the measuring device. The serial number can be used to identify the measuring device and to retrieve further information on the measuring device, such as the related documentation, via the Device Viewer or Operations app.

Additional information:

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

User interface Character string comprising numbers, letters and special characters (#11)

Order code

Navigation  System → Information → Device → Order code


Description Displays the device order code.

Additional information:

The order code can be used for instance to order a replacement or spare device or to verify that the device features specified on the order form match the shipping note.





User interface Character string comprising numbers, letters and special characters (#20)

Firmware version

Navigation  System → Information → Device → Firmware version

Description Displays the device firmware version installed.

User interface Character string comprising numbers, letters and special characters (#8)

Extended order code 1	
Navigation	 System → Information → Device → Ext. order cd. 1
Description	<p>Displays the first, second and/or third part of the extended order code. Due to character length restrictions, the extended order code is split into a maximum of 3 parameters. The extended order code indicates for each feature in the product structure the selected option, thereby uniquely identifying the device model.</p> <p>Additional information: The extended order code can also be found on the nameplate.</p>
User interface	Character string comprising numbers, letters and special characters (#20)
Extended order code 2	
Navigation	 System → Information → Device → Ext. order cd. 2
Description	<p>Displays the first, second and/or third part of the extended order code. Due to character length restrictions, the extended order code is split into a maximum of 3 parameters. The extended order code indicates for each feature in the product structure the selected option, thereby uniquely identifying the device model.</p> <p>Additional information: The extended order code can also be found on the nameplate.</p>
User interface	Character string comprising numbers, letters and special characters (#20)
Extended order code 3	
Navigation	 System → Information → Device → Ext. order cd. 3
Description	<p>Displays the first, second and/or third part of the extended order code. Due to character length restrictions, the extended order code is split into a maximum of 3 parameters. The extended order code indicates for each feature in the product structure the selected option, thereby uniquely identifying the device model.</p> <p>Additional information: The extended order code can also be found on the nameplate.</p>
User interface	Character string comprising numbers, letters and special characters (#20)
ENP version	
Navigation	 System → Information → Device → ENP version
Description	Displays the version of the electronic nameplate (ENP).

User interface Character string comprising numbers, letters and special characters (#16)


Manufacturer

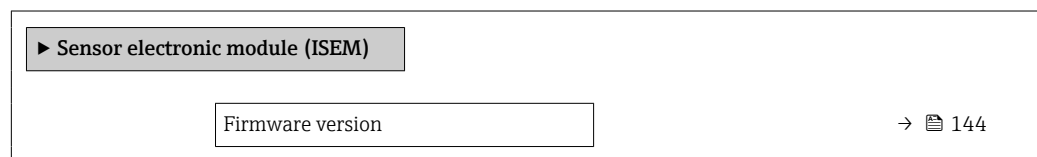
Navigation  System → Information → Device → Manufacturer

Description Displays the manufacturer.

User interface Character string comprising numbers, letters and special characters (#32)

5.5.2 "Sensor electronic module (ISEM)" submenu

Navigation  System → Information → Sens. electronic




Firmware version

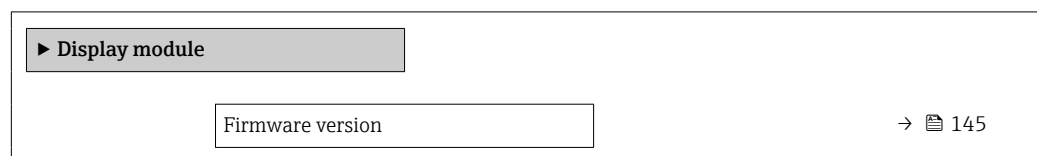
Navigation  System → Information → Sens. electronic → Firmware version

Description Displays the firmware version of the module.

User interface Positive integer

5.5.3 "Display module" submenu

Navigation  System → Information → Display module



Firmware version

Navigation System → Information → Display module → Firmware version**Description**










Displays the firmware version of the module.

User interface

Positive integer

5.6 "Display" submenu

Navigation   System → Display

► Display	
Language	→  146
Value 1 display	→  147
Value 2 display	→  147
Value 3 display	→  148
Value 4 display	→  148
Display damping	→  148
Rotation display	→  149
Brightness	→  149
Color scheme	→  149

Language

Navigation   System → Display → Language

Description Set display language.

Selection

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

* Visibility depends on order options or device settings

- ภาษาไทย (Thai) *
- tiếng Việt (Vietnamese)
- čeština (Czech)

Value 1 display

Navigation

  System → Display → Value 1 display

Description

Select the measured value that is displayed first on the local display.

Additional information:

The applicable unit of measure is specified in the "System units" submenu.

Selection

- Volume flow
- Mass flow
- Conductivity *
- Corrected conductivity *
- Temperature *
- Totalizer 1
- Totalizer 2
- Totalizer 3

Value 2 display

Navigation

  System → Display → Value 2 display

Description

Select the measured value that is shown second on the local display.

Additional information:

The applicable unit of measure is specified in the "System units" submenu.

Selection

- None
- Volume flow
- Mass flow
- Conductivity *
- Corrected conductivity *
- Temperature *
- Totalizer 1
- Totalizer 2
- Totalizer 3

* Visibility depends on order options or device settings

Value 3 display



Navigation System → Display → Value 3 display

Description Select the measured value that is shown third on the local display.
Additional information:
The applicable unit of measure is specified in the "System units" submenu.

Selection

- None
- Volume flow
- Mass flow
- Conductivity *
- Corrected conductivity *
- Temperature *
- Totalizer 1
- Totalizer 2
- Totalizer 3

Value 4 display



Navigation System → Display → Value 4 display

Description Select the measured value that is shown fourth on the local display.
Additional information:
The applicable unit of measure is specified in the "System units" submenu.

Selection

- None
- Volume flow
- Mass flow
- Conductivity *
- Corrected conductivity *
- Temperature *
- Totalizer 1
- Totalizer 2
- Totalizer 3

Display damping



Navigation System → Display → Display damping

Description Enter time constant (PT1 element) to set reaction time of the display to fluctuations in the measured value.
Additional information:
- The smaller the time constant the faster the display reacts to fluctuations in the measured value.
- If the time constant is set to 0, damping is deactivated.

* Visibility depends on order options or device settings

User entry 0.0 to 999.9 s

Rotation display



Navigation   System → Display → Rotation display

Description Select rotation angle of the display text to optimize local display readability.

Selection

- Auto
- 0 degree
- 90 degree
- 180 degree
- 270 degree

Brightness

Navigation   System → Display → Brightness

Description Adjust brightness.

User entry 0 to 100 %

Color scheme



Navigation   System → Display → Color scheme

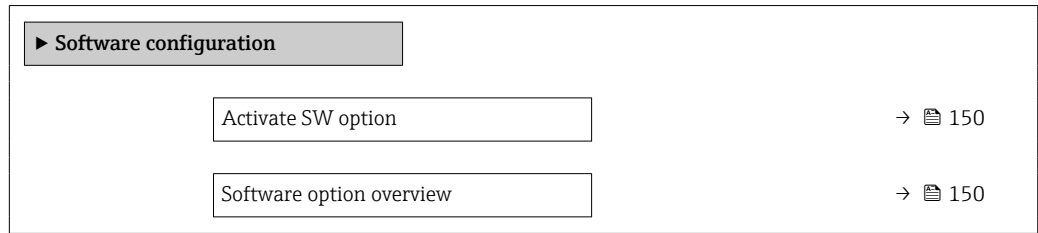
Description Select preferred color scheme.

Selection

- Light
- Dark

5.7 "Software configuration" submenu

Navigation  System → Software config.



Activate SW option

Navigation  System → Software config. → Activate SW opt.

Description Enter application package code or code of the functionality ordered separately to activate it.

Additional information:

- If a measuring device was ordered with an add-on software option, the activation code is programmed into the measuring device ex factory.
- After entering the activation code: Check whether the new software option is displayed in the "Software option overview" parameter and therefore active.

NOTE

If an invalid code is entered the software options that have already been activated are invalidated!

Before entering a new activation code: Create a record of the existing activation code.

User entry Positive integer

Software option overview

Navigation  System → Software config. → SW option overv.

Description Displays all software options included in the order ex factory or ordered at a later date that have been enabled via the operating interface.

Additional information:

If a new software option is not displayed after entering the activation code, the code entered was inaccurate or invalid. In this case, contact the appropriate Endress+Hauser sales organization to activate the software option.

User interface

- Heartbeat Verification
- Heartbeat Monitoring

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