Services

GP01154D/06/EN/01.21 71510279 2021-09-15 Valid as of version 01.00.zz (Device firmware)

### Description of Device Parameters **Proline Promag 800**

Electromagnetic flowmeter Cellular radio





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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 for certain types of information

Symbol	Meaning
i	Tip Indicates additional information.
	Reference to documentation
	Reference to page
	Reference to graphic
A0028662	Operation via local display
A0028663	Operation via operating tool
A0028665	Write-protected parameter

#### 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 (→ 
   <sup>(⇒)</sup> 6), which guides the user automatically through all the device parameters that are required for commissioning
- Application menu (→ 
   <sup>⊕</sup> 49)
- Diagnostics menu (→ 🗎 30)
- **System** menu (→ 🗎 83)

#### 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 pa	arameter is only available under these specific conditions	
Description	Descri	Description of the parameter function	
Selection	List of • Opti • Opti	List of the individual options for the parameter • Option 1 • Option 2	
User entry	Input 1	range for the parameter	
User interface	Displa	Display value/data for the parameter	
Factory setting	Default setting ex works		
Additional information	Additi On i On c On t On t	onal explanations (e.g. in examples): individual options display values/data the input range the factory setting	

• On the parameter function

#### 1.4 Documentation

The Description of Device Parameters is part of the following documentation:

#### 1.4.1 Operating Instructions

Measuring device	Documentation code
Proline 800	BA02080D

#### 1.4.2 Special Documentation

Contents	Documentation code
Heartbeat Technology	SD01746D
Cellular Module	SD02335D
Display with Bluetooth Interface	SD02655D
Using Open Source Software Licenses	SD02658D
Quick Reference Guide	SD02659D
OPC-UA	SD02663D
Information on Custody Transfer Measurement	SD02038D

#### 2 "Guidance" menu

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

Navigation	🗟 🖴 Guidance	
Guidance		
	► Commissioning	→ 🗎 6
	► Update certificates	→ 🗎 20
	► Import / Export	→ 🗎 27

#### 2.1 "Commissioning" wizard

Complete this wizard to commission the device.

For each parameter, enter the appropriate value or select the appropriate option.

#### NOTE

If you exit the wizard before completing all required parameters, the changes you made will be saved. For this reason, the device may be in an undefined state! In this case, a reset to the default settings is recommended.

► Commissioning	
Device tag	→ 🖺 8
Serial number	→ 🖺 8
Firmware version	→ 🗎 8
Device name	→ 🖺 8
Volume flow unit	→ 🗎 9
Volume unit	→ 🗎 10
Temperature unit	→ 🗎 10
Pressure unit	→ 🗎 10
Assign process variable	→ 🗎 11
Unit totalizer 1 to n	→ 🗎 11
Totalizer operation mode	→ 🗎 11

#### *Navigation* $\square$ Guidance $\rightarrow$ Commissioning

Failure mode	]	→ 🗎 12
Low flow cut off	]	→ 🗎 13
On value low flow cutoff	]	→ 🗎 13
Off value low flow cutoff	]	→ 🗎 13
Empty pipe detection	]	→ 🗎 13
Operating mode	]	→ 🗎 14
Assign pulse output 1 to n	]	→ 🖺 14
Pulse width	]	→ 🗎 15
Value per pulse	]	→ 🗎 15
Switch output function	]	→ 🗎 15
Assign diagnostic behavior	]	→ 🗎 16
Assign limit	]	→ 🗎 16
Switch-on value	]	→ 🗎 17
Switch-off value		→ 🗎 17
Assign status		→ 🗎 17
Failure mode	]	→ 🗎 18
Value 1 display		→ 🗎 18
Value 2 display		→ 🗎 18
Value 3 display		→ 🖺 19
Value 4 display		→ 🗎 19
Display damping	]	→ 🗎 12
	]	

Device tag				
Navigation	$\Box \qquad Guidance \rightarrow Commissioning \rightarrow Device tag$			
Description	Enter a unique name for the measuring point to identify the device quickly within the plant.			
<b>User entry</b> Character string comprising numbers, letters and special characters (#32)				
Serial number				
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ 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 $\rightarrow$ Commissioning $\rightarrow$ Firmware version			
Description	Displays the device firmware version installed.			
User interface	Character string comprising numbers, letters and special characters (#8)			
Device name				
Navigation	$ \qquad \qquad$			
Description	Displays the name of the transmitter. Additional information:			

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

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

Volume flow unit			Â
Navigation	$\Box \qquad \text{Guidance} \rightarrow \text{C}$	ommissioning → Volume flow unit	t
Description	Select volume flow u	nit.	
Selection	SI units $cm^3/s$ $cm^3/min$ $cm^3/d$ $dm^3/s$ $dm^3/min$ $dm^3/h$ $dm^3/d$ $m^3/s$ $m^3/min$ $m^3/h$ $m^3/d$ ml/s ml/min ml/h ml/d 1/s 1/min 1/h 1/d hl/s hl/min hl/h hl/h Ml/min Ml/h Ml/d	US units af/s af/s af/min af/h af/d ft <sup>3</sup> /s ft <sup>3</sup> /min ft <sup>3</sup> /h ft <sup>3</sup> /d MMft <sup>3</sup> /s MMft <sup>3</sup> /d MMft <sup>3</sup> /h Mft <sup>3</sup> /d fl oz/s (us) afl oz/min (us) afl oz/h (us) agal/s (us) gal/s (us) gal/s (us) gal/h (us) gal/d (us) Mgal/d (us) Mgal/d (us) Mgal/d (us) Mgal/d (us) bbl/s (us;liq.) bbl/min (us;liq.) bbl/min (us;liq.) bbl/min (us;liq.) bbl/h (	Imperial units 9 gal/s (imp) 9 gal/h (imp) 9 gal/d (imp) 9 Mgal/s (imp) 9 Mgal/h (imp) 9 Mgal/d (imp) 9 bbl/s (imp;beer) 9 bbl/h (imp;beer) 9 bbl/d (imp;beer) 9 bbl/s (imp;oil) 9 bbl/h (imp;oil) 9 bbl/d (imp;oil) 9 bbl/d (imp;oil) 9 bbl/d (imp;oil)

Volume unit				A
Navigation	$ \qquad \qquad$	ommissioning → Volume unit		
Description	Select volume unit.			
Selection	SI units • cm <sup>3</sup> • dm <sup>3</sup> • m <sup>3</sup> • ml • l • hl • Ml Mega	US units af ft <sup>3</sup> Mft <sup>3</sup> fl oz (us) gal (us) kgal (us) Mgal (us) bbl (us;oil) bbl (us;liq.) bbl (us;tank)	Imperial units • gal (imp) • Mgal (imp) • bbl (imp;beer) • bbl (imp;oil)	

l'emperature unit	emperature unit
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ß

ß

Navigation	$ \qquad \qquad$	oning → Temperature unit
Description	Select temperature unit.	
Selection	SI units ■ °C ■ K	US units ■ °F ■ °R

Navigation

Description

Select process pressure unit.

 $\mathsf{Guidance} \rightarrow \mathsf{Commissioning} \rightarrow \mathsf{Pressure} \text{ unit}$ 

US units

• psi a

psi g

Selection

 MPa a MPa g

SI units

- kPa a ■ kPa g
- Pa a
- Pag
- bar
- bar g

Assign process varia	ble			ß
Navigation	$ \qquad \qquad$	ommissioning → Assign variabl	e	
Description	Select process variab	le for totalizer.		
-	Additional informati If the option selected	on: l is changed, the device resets tl	he totalizer to "0".	
Selection	<ul><li> Off</li><li> Volume flow</li></ul>			
Unit totalizer				Â
Navigation	□ Guidance $\rightarrow$ Co	ommissioning → Unit totalizer 1	1 to n	
Description	Select process variable totalizer unit.			
Selection	SI units • cm <sup>3</sup> * • dm <sup>3</sup> * • m <sup>3</sup> * • ml* • l* • hl* • Ml Mega*	US units • af * • ft <sup>3</sup> * • Mft <sup>3</sup> * • fl oz (us) * • gal (us) * • kgal (us) * • Mgal (us) * • bbl (us;liq.) * • bbl (us;cil) * • bbl (us;tank) *	Imperial units 9 gal (imp) * 9 Mgal (imp) * 9 bbl (imp;beer) * 9 bbl (imp;oil) *	
	* Visibility depends of	on order options or device settings		
	or Other units			
	INOIIE	n andar antions on device active-		
	" visibility depends o	on order options or device settings		

Totalizer operation mode			Ê
Navigation		Guidance $\rightarrow$ Commissioning $\rightarrow$ Operation mode	
Description	Selec	t totalizer calculation mode.	
Selection	■ Net ■ For ■ Rev	flow total ward flow total rerse flow total	

Ê

Additional information	<ul> <li>Selection</li> <li>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.</li> <li>Forward flow total option Only the flow in the forward flow direction is totalized.</li> <li>Reverse flow total option Only the flow in the reverse flow direction is totalized (= reverse flow quantity).</li> </ul>
Failure mode	
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ Failure mode
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><li>Stop</li><li>Actual value</li><li>Last valid value</li></ul>
Additional information	<ul> <li>Selection</li> <li>Stop option The totalizer is stopped in the event of a device alarm.</li> <li>Actual value option</li> </ul>

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.

Display damping	ß
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ 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.
User entry	0.0 to 999.9 s

Low flow cut off		
Navigation	$ \qquad \qquad$	
Description	Select process variable for low flow cut off to activate low flow cut off.	
Selection	<ul><li>Off</li><li>Volume flow</li></ul>	

On value low flow cutof	f	
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ 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		ß
Navigation	$ \qquad \qquad$	
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		æ
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ Empty pipe det.	
Description	Switch empty pipe detection on or off. Switch on empty pipe detection to detect a part filled or empty measuring tube.	ally
Selection	<ul><li>Off</li><li>On</li></ul>	

Operating mode	ß
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ Operating mode
Description	Set the output mode to pulse or switch.
Selection	<ul><li>Pulse</li><li>Switch</li></ul>
Additional information	Selection
	<ul> <li>Pulse option Quantitatively proportional pulse with pulse width to be configured. Whenever a specific volume has been reached (pulse value), a pulse is emitted, the duration of which is set within the "Pulse width" parameter.</li> <li>Switch option Indicates when the state of the device changes, e.g. when a specified limit value is reached. Additional information: <ul> <li>The switch output can be in one of two states: either it is conductive or it is non-conductive.</li> <li>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 or, in case of battery-operated devices, it will emit a pulse, i.e. the switch output will be closed and conductive for the duration of the pulse.</li> <li>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.</li> </ul> </li> </ul>

Assign pulse output		æ
Navigation	$ \qquad \qquad$	
Description	Select process variable for pulse output.	
Selection	<ul><li>Off</li><li>Volume flow</li></ul>	

Pulse width	6	3
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ Pulse width	
Description	Specify the duration of the output pulse.	
-	Additional information: The maximum pulse rate is defined by fmax = 1 / (2 × 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 Qmax = fmax × 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 - fmax: 1 / (2 × 0.1 ms) = 5 kHz - Qmax: 5 kHz × 0.1 g = 0.5 kg/s	
User entry	0.1 to 500 ms	
Value per pulse	6	9
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ Value per pulse	
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 function	 	9
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ Switch out funct	
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.	1
Selection	<ul> <li>Off</li> <li>On</li> <li>Diagnostic behavior</li> <li>Limit</li> <li>Flow direction check</li> <li>Status</li> </ul>	

lection
le

• 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
- Emits a pulse if there is a pending diagnostic event of the assigned behavioral category. **Limit** option
- Emits a pulse if a limit value specified for the process variable has been reached.
- Flow direction check option
  - Emits a pulse when the flow direction changes.
- Status option Emits a pulse to indicate the device status for empty pipe detection or low flow cut off, whichever option is assigned to the switch output.

Assign diagnostic behavi	or	ß
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ Assign diag. beh	
Description	Select the diagnostic behavior for which the switch output should emit a pulse.	
Selection	<ul><li>Alarm</li><li>Alarm or warning</li><li>Warning</li></ul>	
Additional information	Selection	
	<ul> <li>Alarm option The switch output only emits a pulse for diagnostic events of the "Alarm" category.</li> <li>Alarm or warning option The switch output emits a pulse for diagnostic events of the "Alarm" or "Warning" category.</li> <li>Warning option The switch output only emits a pulse for diagnostic events of the "Warning" category</li> </ul>	τ.
Assign limit		Â
Navigation	$ \qquad \qquad$	
Description	Select the process variable to monitor in case the specified limit value is exceeded. If a value for the selected process variable is exceeded, the output emits a pulse.	limit
Selection	<ul> <li>Off</li> <li>Volume flow</li> <li>Flow velocity</li> <li>Conductivity*</li> </ul>	

- Totalizer 1
- Totalizer 2

Visibility depends on order options or device settings

Totalizer 3
Pressure<sup>\*</sup>

- Battery state of charge

Switch-on value		æ
Navigation	$ \qquad \qquad$	
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		A
Navigation	$ \qquad \qquad$	
Description	Enter limit value for the switch-off point (process variable < switch-off value = open, conductive).	non-
	Additional information: To use a hysteresis: Switch-on point > Switch-off point.	
User entry	Signed floating-point number	
Assign status		
Navigation	$\Box \qquad Guidance \rightarrow Commissioning \rightarrow Assign status$	
Description	Select the device status to display for the switch output.	
	Additional information: If the switch on point for empty pipe detection / low flow cut off is reached, the outpu conductive. Otherwise, the switch output is non-conductive.	ıt is
Selection	<ul><li>Empty pipe detection</li><li>Low flow cut off</li></ul>	

<sup>\*</sup> Visibility depends on order options or device settings

Failure mode		
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ Failure mode	
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><li>Actual status</li><li>Open</li><li>Closed</li></ul>	
Additional information	<ul> <li>Selection</li> <li>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. </li> <li>Open option In the event of a device alarm, the switch output's transistor is set to "non-conductive"</li></ul>	n.

Value 1 display		
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ 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> <li>Volume flow</li> <li>Conductivity*</li> <li>Pressure*</li> <li>Totalizer 1</li> <li>Totalizer 2</li> <li>Totalizer 3</li> </ul>	

Value 2 display		ß
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ 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.	

<sup>\*</sup> Visibility depends on order options or device settings

#### Selection

- None
- Volume flow
  Conductivity\*
  Pressure\*

- Totalizer 1
- Totalizer 2
- Totalizer 3

Value 3 display		
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ 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	<ul> <li>None</li> <li>Volume flow</li> <li>Conductivity*</li> <li>Pressure*</li> <li>Totalizer 1</li> <li>Totalizer 2</li> <li>Totalizer 3</li> </ul>	

Value 4 display		
Navigation	□ Guidance $\rightarrow$ Commissioning $\rightarrow$ 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	<ul> <li>None</li> <li>Volume flow</li> <li>Conductivity*</li> <li>Pressure*</li> <li>Totalizer 1</li> <li>Totalizer 2</li> <li>Totalizer 3</li> </ul>	

<sup>\*</sup> Visibility depends on order options or device settings

#### 2.2 "Update certificates" wizard

Complete this wizard to renew a certificate on a field device.

#### NOTE

If you are using the Endress+Hauser cloud solution, your certificates are automatically renewed by Endress+Hauser, unless you are connecting a new device with expired certificates!

This might be the case for a spare device purchased at an earlier date.

*Navigation*  $\square$  Guidance  $\rightarrow$  Update certific.

► Update certificates	
MQTT client certificate expires on	→ 🗎 20
MQTT root certificate expires on	→ 🗎 21
Select step	→ 🗎 21
Country code	→ 🗎 21
State or province	→ 🗎 26
Organization unit	→ 🗎 26
Locality	→ 🗎 26
Organization	→ 🗎 26
File name	→ 🗎 27
File name	→ 🗎 27
File name	→ 🗎 27
Transfer status	→ 🗎 27
File name	→ 🗎 27
Transfer status	→ 🗎 27
Result	→ 🗎 27

#### MQTT client certificate expires on

#### Navigation

□ Guidance  $\rightarrow$  Update certific.  $\rightarrow$  ClientCertExpir.

Description

Displays the measuring device certificate expiration date.

#### User interface

Positive integer

MQTT root certificate expires on		
Navigation	□ Guidance $\rightarrow$ Update certific. $\rightarrow$ RootCert.expir.	
Description	Displays the MQTT broker root certificate expiration date.	
User interface	Positive integer	
Select step	۵	
Navigation	$ \qquad \qquad$	
Description	Select the appropriate option to renew a certificate.	
Selection	<ul> <li>Get CSR</li> <li>Write SPK to device</li> <li>Write TCC to device</li> </ul>	
Additional information	<ul> <li>Selection</li> <li>Get CSR option Generates a Certificate Signing Request (CSR). This is the first step to renew the MQTT client certificate (Signed Public Key). The CSR must be submitted to the certificate authority, which provides the Signed Public Key as well as the Trusted Certificate Chain (root certificate) for the device in return.</li> <li>Write SPK to device option Writes the Signed Public Key received from the Certificate Authority to the device. This is the second step to renew the MQTT client certificate (Signed Public Key). If you are renewing both the Signed Public Key and the Trusted Certificate Chain (root certificate), select the 'Write TCC to device' option to write the Trusted Certificate Chain to the device next once this step is complete.</li> <li>Writes the MQTT broker's Trusted Certificate Chain (root certificate) to the device.</li> </ul>	

Country code		â
Navigation	□ Guidance $\rightarrow$ Update certific. $\rightarrow$ Country code	
Description	Select the two-digit country code of the country in which the organization operates.	
Selection	<ul> <li>AD : Andorra</li> <li>AE : United Arab Emirates</li> <li>AF : Afghanistan</li> <li>AG : Antigua and Barbuda</li> <li>AI : Anguilla</li> </ul>	

- AL : Albania
- AM : Armenia
- AO : Angola
- AQ : Antarctica
- AR : Argentina
- AS : American Samoa
- AT : Austria
- AU : Australia
- AW : Aruba
- AX : Åland Islands
- AZ : Azerbaijan
- BA : Bosnia and Herzegovina
- BB : Barbados
- BD : Bangladesh
- BE : Belgium
- BF : Burkina Faso
- BG : Bulgaria
- BH : Bahrain
- BI : Burundi
- BJ : Benin
- BL : Saint Barthélemy
- BM : Bermuda
- BN : Brunei Darussalam
- BO : Bolivia, Plurinational State of
- BQ : Bonaire, Sint Eustatius and Saba
- BR : Brazil
- BS : Bahamas
- BT : Bhutan
- BV : Bouvet Island
- BW : Botswana
- BY : Belarus
- BZ : Belize
- CA : Canada
- CC : Cocos (Keeling) Islands
- CD : Congo, the Democratic Republic of the
- CF : Central African Republic
- CG : Congo
- CH : Switzerland
- CI : Côte d'Ivoire
- CK : Cook Islands
- CL : Chile
- CM : Cameroon
- CN : China
- CO : Colombia
- CR : Costa Rica
- CU : Cuba
- CV : Cabo Verde
- CW : Curaçao
- CX : Christmas Island
- CY : Cyprus
- CZ : Czechia
- DE : Germany
- DJ : Djibouti
- DK : Denmark
- DM : Dominica
- DO : Dominican Republic
- DZ : Algeria
- EC : Ecuador
- EE : Estonia

- EG : Egypt
- EH : Western Sahara
- ER : Eritrea
- ES : Spain
- ET : Ethiopia
- FI : Finland
- FJ : Fiji
- FK : Falkland Islands
- FM : Micronesia
- FO : Faroe Islands
- FR : France
- GR : Greece
- GB : United Kingdom of Great Britain and Northern Ireland
  - GA : Gabon
  - GP : Guadeloupe
  - GE : Georgia
  - GF : French Guiana
  - GN : Guinea
  - GM : Gambia
  - GD : Grenada
  - GG : Guernsey
  - GH : Ghana
  - GI : GI
  - GL : Greenland
  - GQ : Equatorial Guinea
- GS : South Georgia and the South Sandwich Islands
- GT : Guatemala
- GU : Guam
- GW : Guinea-Bissau
- GY : Guyana
- HK : Hong Kong
- HM : Heard Island and McDonald Islands
- HN : Honduras
- HR : Croatia
- HT : Haiti
- HU : Hungary
- IL : Israel
- IE : Ireland
- ID : Indonesia
- IM : Isle of Man
- IN : India
- IO : British Indian Ocean Territory
- IQ : Iraq
- IR : Iran
- IS : Iceland
- IT : Italy
- JE : Jersey
- JM : Jamaica
- JO : Jordan
- JP : Japan
- KH : Cambodia
- KG : Kyrgyzstan
- KE : Kenya
- KI : Kiribati
- KM : Comoros
- KN : Saint Kitts and Nevis
- KP : Korea
- KR : Korea
- KW : Kuwait

- KY : Cayman Islands
- KZ : Kazakhstan
- LU : Luxembourg
- LI : Liechtenstein
- LC : Saint Lucia
- LB : Lebanon
- LA : Lao People's Democratic Republic
- LK : Sri Lanka
- LR : Liberia
- LS : Lesotho
- LT : Lithuania
- LV : Latvia
- LY : Libya
- MH : Marshall Islands
- ME : Montenegro
- MD : Moldova
- MC : Monaco
- MA : Morocco
- MF : Saint Martin
- MG : Madagascar
- MK : North Macedonia
- ML : Mali
- MM : Myanmar
- MN : Mongolia
- MO : Macao
- MP : Northern Mariana Islands
- MQ : Martinique
- MR : Mauritania
- MS : Montserrat
- MT : Malta
- MU : Mauritius
- MV : Maldives
- MW : Malawi
- MX : Mexico
- MY : Malaysia
- MZ : Mozambique
- NE : Niger
- NF : Norfolk Island
- NG : Nigeria
- NC : New Caledonia
- NA : Namibia
- NI : Nicaragua
- NL : Netherlands
- NO : Norway
- NP : Nepal
- NR : Nauru
- NU : Niue
- NZ : New Zealand
- OM : Oman
- PA : Panama
- PE : Peru
- PF : French Polynesia
- PG : Papua New Guinea
- PH : Philippines
- PK : Pakistan
- PL : Poland
- PM : Saint Pierre and Miquelon
- PN : Pitcairn
- PR : Puerto Rico

- PS : Palestine
- PT : Portugal
- PW : Palau
- PY : Paraguay
- QA : Qatar
- RE : Réunion
- RO : Romania
- RS : Serbia
- RU : Russian Federation
- RW : Rwanda
- SA : Saudi Arabia
- SB : Solomon Islands
- SC : Seychelles
- SD : Sudan
- SE : Sweden
- SG : Singapore
- SH : Saint Helena, Ascension and Tristan da Cunha
- SI : Slovenia
- SJ : Svalbard and Jan Mayen
- SK : Slovakia
- SL : Sierra Leone
- SM : San Marino
- SN : Senegal
- SO : Somalia
- SR : Suriname
- SS : South Sudan
- ST : Sao Tome and Principe
- SV : El Salvador
- SX : Sint Maarten
- SY : Syrian Arab Republic
- SZ : Eswatini
- TC : Turks and Caicos Islands
- TD : Chad
- TJ : Tajikistan
- TK : Tokelau
- TL : Timor-Leste
- TM : Turkmenistan
- TN : Tunisia
- TR : Turkey
- TT : Trinidad and Tobago
- TF : French Southern Territories
- TG : Togo
- TH : Thailand
- TO : Tonga
- TV : Tuvalu
- TW : Taiwan
- TZ : Tanzania
- UA : Ukraine
- UG : Uganda
- UM : United States Minor Outlying Islands
- US : United States of America
- UY : Uruguay
- UZ : Uzbekistan
- VA : Holy See
- VC : Saint Vincent and the Grenadines
- VE : Venezuela
- VG : Virgin Islands
- VI : Virgin Islands
- VN : Viet Nam

- VU : Vanuatu
- WF : Wallis and Futuna
- WS : Samoa
- YE : Yemen
- YT : Mayotte
- ZA : South Africa
- ZM : Zambia
- ZW : Zimbabwe

State or province		æ
Navigation	□ Guidance $\rightarrow$ Update certific. $\rightarrow$ State/province	
Description	Enter the state or region where the organization operates.	
User entry	Character string comprising numbers, letters and special characters (#32)	
Organization unit		æ
Navigation	□ Guidance $\rightarrow$ Update certific. $\rightarrow$ Org. unit	
Description	Enter the organizational unit to which the certificate applies.	
User entry	Character string comprising numbers, letters and special characters (#32)	
Locality		Â
Navigation	$\Box \qquad Guidance \rightarrow Update certific. \rightarrow Locality$	
Description	Enter the city or town where the organization is located.	
User entry	Character string comprising numbers, letters and special characters (#32)	
Organization		Â
Navigation	□ Guidance $\rightarrow$ Update certific. $\rightarrow$ Organization	
Description	Enter the organization to which the certificate applies.	
User entry	Character string comprising numbers, letters and special characters (#32)	

File name		Ê
Navigation	Image: Guidance → Update certific. → File name	
Description	Displays the file name.	
User entry	Character string comprising numbers, letters and special characters (#512)	
File name		
Navigation	Image: Guidance → Update certific. → File name	
Description	Displays the file name.	
User entry	Character string comprising numbers, letters and special characters (#512)	
Transfer status		Â
Navigation	Image: Guidance → Update certific. → Transfer status	
Description	Review the transfer status.	
Selection	<ul><li>OK</li><li>Failed</li></ul>	
Result		 (B)
Navigation	$ \qquad \qquad$	
Description	Displays the result of the transfer.	
Selection	<ul><li>Transfer successful</li><li>Device error</li></ul>	

- Aborted by user
- Other error

#### 2.3 "Import / Export" submenu

Use the Import/Export functionality to import or export data, e.g. to generate a report.

Navigation  $\square$  Guidance  $\rightarrow$  Import / Export

#### 3

#### "Device information" menu

Navigation

Device info

Device information	 
Status signal	→ 🖺 29
Volume flow	→ 🗎 29

Status signal	
Navigation	$\square \qquad \text{Device info} \rightarrow \text{Status signal}$
User interface	<ul> <li>OK</li> <li>Failure (F)</li> <li>Function check (C)</li> <li>Out of specification (S)</li> <li>Maintenance required (M)</li> <li></li> <li>Not categorized</li> </ul>

Navigation	$\square  \text{Application} \rightarrow \text{Measured values} \rightarrow \text{Volume flow}$
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

Volume flow

#### 4 "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	→ 🗎 30
	► Diagnostic list	→ 🗎 32
	► Simulation	→ 🗎 34
	► Diagnostic settings	→ 🗎 37

#### 4.1 "Active diagnostics" submenu

*Navigation*  $\square$  Diagnostics  $\rightarrow$  Active diagnos.

► Active diagnostics		
Actual diagnostics	→ 🗎 30	
Timestamp	→ 🗎 31	
Previous diagnostics	→ 🗎 31	
Timestamp	→ 🗎 31	
Operating time from restart	→ 🗎 31	
Operating time	→ 🗎 31	

## Actual diagnostics Navigation □ Diagnostics → Active diagnos. → Actual diagnos. 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 $\rightarrow$ Active diagnos. $\rightarrow$ 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 $\rightarrow$ Active diagnos. $\rightarrow$ Prev.diagnostics	
Description	Displays the diagnostic message for the last diagnostic event that has ended.	
User interface	Positive integer	
Timestamp		
Navigation	□ Diagnostics $\rightarrow$ Active diagnos. $\rightarrow$ 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 resta	rt	
Navigation	□ Diagnostics $\rightarrow$ Active diagnos. $\rightarrow$ 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 $\rightarrow$ Active diagnos. $\rightarrow$ Operating time	
Description	Indicates how long the device has been in operation.	

User interface

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

#### 4.2 "Diagnostic list" submenu

*Navigation*  $\square$  Diagnostics  $\rightarrow$  Diagnostic list  $\rightarrow$  Diagnostics 1

► Diagnostic list			
Diagnostic	s 1	] .	→ 🗎 32
Timestam	p	] .	→ 🗎 32
Diagnostic	s 2	]	→ 🖺 33
Timestam	p	]	→ 🖺 33
Diagnostic	s 3	]	→ 🖺 33
Timestam	p	]	→ 🖺 33
Diagnostic	s 4	]	→ 🗎 33
Timestam	p	] .	→ 🗎 34
Diagnostic	s 5	]	→ 🗎 34
Timestam	p	] .	→ 🖺 34

# 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 $\rightarrow$ Diagnostic list $\rightarrow$ Diagnostics 2	
Description	Displays the currently active diagnostic message with the second highest priority.	
User interface	Positive integer	
Timestamp		
Navigation	□ Diagnostics $\rightarrow$ Diagnostic list $\rightarrow$ 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 $\rightarrow$ Diagnostic list $\rightarrow$ Diagnostics 3	
Description	Displays the currently active diagnostic message with the third highest priority.	
User interface	Positive integer	
Timestamp		
Navigation	□ Diagnostics $\rightarrow$ Diagnostic list $\rightarrow$ 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 $\rightarrow$ Diagnostic list $\rightarrow$ Diagnostics 4	
Description	Displays the currently active diagnostic message with the fourth highest priority.	

User interface	Positive integer	
Timestamp		
Navigation	□ Diagnostics $\rightarrow$ Diagnostic list $\rightarrow$ 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 $\rightarrow$ Diagnostic list $\rightarrow$ Diagnostics 5	
Description	Displays the currently active diagnostic message with the fifth-highest priority.	
User interface	Positive integer	
Timestamp		
Navigation	□ Diagnostics $\rightarrow$ Diagnostic list $\rightarrow$ Timestamp	
Description	Displays the timestamp for the diagnostic message with the fifth highest priority.	
User interface	Days (d), hours (h), minutes (m), seconds (s)	

#### 4.3 "Simulation" submenu

Navigation	

Diagnostics  $\rightarrow$  Simulation

► Simulation	
Assign simulation process variable	→ 🗎 35
Process variable value	→ 🖹 35
Pulse output simulation 1 to n	→ 🗎 35
Pulse value 1 to n	→ 🗎 36

Device alarm simulation	]	→ 🖺 36
Diagnostic event simulation	]	→ 🖺 37

Assign simulation process variable		ß
Navigation	$\square \qquad \text{Diagnostics} \rightarrow \text{Simulation} \rightarrow \text{Assign procyar}$	
Description	Sologi a process wariable for the simulation, thereby activating it	
Selection	<ul> <li>Off</li> <li>Volume flow</li> <li>Flow velocity</li> <li>Conductivity *</li> <li>Temperature *</li> <li>Pressure</li> </ul>	

Process variable value	
Navigation	□ Diagnostics $\rightarrow$ Simulation $\rightarrow$ Proc. var. value
Description	Enter the simulation value for the selected process variable. Processing of measured values downstream as well as the signal ouput follow this value. In this way, it is possibe 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

Pulse output simulation 1 to n		Ê
Navigation	□ Diagnostics $\rightarrow$ Simulation $\rightarrow$ Puls.outp.sim. 1 to n	
Description	Switch simulation of the pulse output on or off.	
Selection	<ul><li>Off</li><li>Fixed value</li><li>Down-counting value</li></ul>	

<sup>\*</sup> Visibility depends on order options or device settings

Additional information	Selection
	<ul> <li>Off option</li> <li>Simulation of the pulse output is switched off. The</li> </ul>

- 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.

Pulse value 1 to n		A
Navigation	□ Diagnostics $\rightarrow$ Simulation $\rightarrow$ Pulse value 1 to n	
Description	Enter the number of pulses to simulate the pulse output. In this manner, it is possible t verify the pulse output is configured correctly and downstream processing units are functioning properly.	:0
User entry	0 to 65 535	
Diagnostic event category		Ê
Navigation	□ Diagnostics $\rightarrow$ Simulation $\rightarrow$ Event category	
Description	Select the category of diagnostic events that should be available for selection in the "Diagnostic event simulation" parameter.	
Selection	<ul> <li>Sensor</li> <li>Electronics</li> </ul>	

- Configuration
- Process

Device alarm simula	tion		
Navigation	□ Diagnostics $\rightarrow$ Simulation $\rightarrow$ 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		
Selection	<ul> <li>Off</li> <li>On</li> </ul>		
Diagnostic event simulation			Ê
-----------------------------	-------	---	---
Navigation		Diagnostics $\rightarrow$ Simulation $\rightarrow$ Diag. event sim.	
Description	Selec	t the diagnostic event to simulate.	
Selection	Off		

# 4.4 "Heartbeat" submenu

# 4.5 "Diagnostic settings" submenu

*Navigation*  $\square$  Diagnostics  $\rightarrow$  Diag. settings

► Diagnostic settings	
► Properties	→ 🗎 37

## 4.5.1 "Properties" submenu

Navigation $\square$ Diagnostics  $\rightarrow$  Diag. settings  $\rightarrow$  Properties

► Properties	
Alarm delay	→ 🖺 37

Alarm delay		A
Navigation	□ Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Properties $\rightarrow$ 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	

For detailed information on the parameter descriptions for the **Heartbeat Verification+Monitoring**application package, refer to the Special Documentation for the device  $\rightarrow \square 5$ 

4.5.2 "Diagnostic configuration" subme
--

Navigation $\Box$ Diagnostics  $\rightarrow$  Diag. settings  $\rightarrow$  Configuration

► Diagnostic configuration		
► Electronics		→ 🗎 38
	Assign behavior of diagnostic no. 376	] → 🗎 39
► Configuration		→ 🗎 39
	Assign behavior of diagnostic no. 443	] → 🗎 39
► Process		→ 🖺 40
	Assign behavior of diagnostic no. 832	] → 🗎 41
	Assign behavior of diagnostic no. 833	) → 🗎 41
	Assign behavior of diagnostic no. 842	) → 🗎 42
	Assign behavior of diagnostic no. 938	→ 🗎 42
	Assign behavior of diagnostic no. 955	) → 🗎 43
	Assign behavior of diagnostic no. 956	→ 🗎 44
	Assign behavior of diagnostic no. 957	→ 🗎 45
	Assign behavior of diagnostic no. 958	→ 🗎 45
	Assign behavior of diagnostic no. 959	→ 🗎 46
	Assign behavior of diagnostic no. 960	→ 🗎 46
	Assign behavior of diagnostic no. 961	→ 🖺 43
	Assign behavior of diagnostic no. 962	] → 🖺 44

## "Electronics" submenu

Navigation

Diagnostics  $\rightarrow$  Diag. settings  $\rightarrow$  Diag. config.  $\rightarrow$  Electronics

► Electronics			
	Assign behavior of diagnostic no. 376	]	→ 🖺 39

Assign behavior of diagnostic no. 376		Ê
Navigation	□ Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Electronics $\rightarrow$ Diagnostic no. 376	
Description	Select behavior for diagnostic event "376 Main electronics faulty".	
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>	
Additional information	<ul> <li>Selection</li> <li>Off option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>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.</li> </ul>	
	"Configuration" submenu	

Navigation		Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Configuration	
► Configuration			
	Assign	behavior of diagnostic no. 443 $\rightarrow$ 🗎 39	

Assign behavior of	diagnostic no. 443	æ
Navigation	□ Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Configuration $\rightarrow$ Diagnostic no.	443
Description	Select behavior for diagnostic event "443 Pulse output faulty".	
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>	

#### 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.

### "Process" submenu

```
Navigation
```

Diagnostics  $\rightarrow$  Diag. settings  $\rightarrow$  Diag. config.  $\rightarrow$  Process

► Process			
	Assign behavior of diagnostic no. 832	]	→ 🗎 41
	Assign behavior of diagnostic no. 833	]	→ 🗎 41
	Assign behavior of diagnostic no. 842	]	→ 🗎 42
	Assign behavior of diagnostic no. 938	]	→ 🗎 42
	Assign behavior of diagnostic no. 955	]	→ 🗎 43
	Assign behavior of diagnostic no. 956	]	→ 🗎 44
	Assign behavior of diagnostic no. 957	]	→ 🖺 45
	Assign behavior of diagnostic no. 958	]	→ 🖺 45
	Assign behavior of diagnostic no. 959	]	→ 🖺 46
	Assign behavior of diagnostic no. 960	]	→ 🖺 46
	Assign behavior of diagnostic no. 961		→ 🗎 43
	Assign behavior of diagnostic no. 962	]	→ 🗎 44

Assign behavior of diagnostic no. 832		
Navigation	$\square$ Diagnostics $\rightarrow$ Diagnostics $\rightarrow$ Diagnostic no. 832	
Inavigation	Diagnostics / Diag. Settings / Diag. coning. / Process / Diagnostic no. 052	
Description	Select behavior for diagnostic event "832 Electronics temperature too high".	
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>	
Additional information	<ul> <li>Selection</li> <li>Off option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Eve logbook" submenu and does not alternate with the standard operational information displayed.</li> </ul>	4 ent

Assign behavior of diagnostic no. 833		A
Navigation	□ Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Process $\rightarrow$ Diagnostic no. 833	
Description	Select behavior for diagnostic event "833 Electronics temperature too low".	
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>	
Additional information	Selection	
	<ul> <li>Off option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Ev- logbook" submenu and does not alternate with the standard operational information displayed</li> </ul>	A ent

Assign behavior of diagn	Assign behavior of diagnostic no. 842			
Navigation	□ Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Process $\rightarrow$ Diagnostic no. 842			
Description	Select behavior for diagnostic event "842 Process value above limit".			
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>			
Additional information	<ul> <li>Selection</li> <li>Off option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Ever logbook" submenu and does not alternate with the standard operational information displayed.</li> </ul>	ıt		

Assign behavior of diagn	Assign behavior of diagnostic no. 938	
Navigation	□ Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Process $\rightarrow$ Diagnostic no. 938	
Description	Select behavior for diagnostic event "938 EMC interference".	
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>	
Additional information	<ul> <li>Selection</li> <li>Off option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Eve logbook" submenu and does not alternate with the standard operational information displayed.</li> </ul>	nt

Assign behavior of diagn	ostic no. 955	Â		
Navigation	□ Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Process $\rightarrow$ Diagnostic no. 955			
Description	Select behavior for diagnostic event "955 Flow limit exceeded".			
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>			
Additional information	<ul> <li>Selection</li> <li>Off option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Eve logbook" submenu and does not alternate with the standard operational information displayed.</li> </ul>	A		

Assign behavior of diagnostic no. 961		ß
Navigation	□ Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Process $\rightarrow$ Diagnostic no. 961	
Description	Select behavior for diagnostic event "961 Electrode potential out of specification".	
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>	
Additional information	Selection	
	<ul> <li>Off option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>Warning option The device continues measuring. The signal outputs and totalizers are not affected diagnostic message is generated.</li> <li>Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Ev logbook" submenu and does not alternate with the standard operational information displayed.</li> </ul>	A rent

Assign behavior of diagn	Assign behavior of diagnostic no. 962			
Navigation	□ Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Process $\rightarrow$ Diagnostic no. 962			
Description	Select behavior for diagnostic event "962 Pipe empty".			
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>			
Additional information	<ul> <li>Selection</li> <li>Off option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Even logbook" submenu and does not alternate with the standard operational information displayed.</li> </ul>	nt		

Assign behavior of diagn	Assign behavior of diagnostic no. 956		
Navigation	□ Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Process $\rightarrow$ Diagnostic no. 956		
Description	Select behavior for diagnostic event "956 Pressure limit exceeded".		
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>		
Additional information	<ul> <li>Selection</li> <li>Off option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>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.</li> </ul>	:	

Assign behavior of diagne	ostic no. 957	Ê
Navigation	□ Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Process $\rightarrow$ Diagnostic no. 957	
Description	Select behavior for diagnostic event "957 Time-dependent flow limit exceeded".	
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>	
Additional information	<ul> <li>Selection</li> <li>Off option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Evelogbook" submenu and does not alternate with the standard operational information displayed.</li> </ul>	4 ent

Assign behavior of diagnostic no. 958		Ê
Navigation	□ Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Process $\rightarrow$ Diagnostic no. 958	
Description	Select behavior for diagnostic event "958 Time-dependent pressure limit exceeded".	
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>	
Additional information	Selection	
	<ul> <li>Off option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>Warning option The device continues measuring. The signal outputs and totalizers are not affected. diagnostic message is generated.</li> <li>Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Ev logbook" submenu and does not alternate with the standard operational information displayed.</li> </ul>	A rent

Assign behavior of diagno	Assign behavior of diagnostic no. 959			
Navigation	□ Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Process $\rightarrow$ Diagnostic no. 959			
Description	Select behavior for diagnostic event "959 Event at status input detected"			
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>			
Additional information	<ul> <li>Selection</li> <li>Off option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Even logbook" submenu and does not alternate with the standard operational information displayed.</li> </ul>	nt		

Assign behavior of diagn	Assign behavior of diagnostic no. 960	
Navigation	Diagnostics $\rightarrow$ Diag. settings $\rightarrow$ Diag. config. $\rightarrow$ Process $\rightarrow$ Diagnostic no. 960	
Description	Soloct behavior for diagnostic event "960 Battery lifetime is less than 180 days"	
Description	Select behavior for diagnostic event 900 battery metime is less than 100 days.	
Selection	<ul> <li>Off</li> <li>Alarm</li> <li>Warning</li> <li>Logbook entry only</li> </ul>	
Additional information	Selection	
	<ul> <li>Off option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>Alarm option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>Warning option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>Logbook entry only option The device continues measuring. The diagnostic message is only displayed in the "Ev logbook" submenu and does not alternate with the standard operational information displayed.</li> </ul>	A rent

# 4.6 "Tracking pointer" submenu

Navigation		Diagnostics $\rightarrow$ Tracking pointer	
► Tracking point	ter		
	► Rese	et minimum/maximum values	→ 🗎 47
	► Elec	tronics temperature	→ 🗎 47

# 4.6.1 "Reset minimum/maximum values" submenu

Navigation		Diagnostics → Tracking pointer →	Reset values
► Reset minimu	m/maximun	values	
	Reset mir	/max values	→ 曽 47

Reset min/max values		ß
Navigation		Diagnostics $\rightarrow$ Tracking pointer $\rightarrow$ Reset values $\rightarrow$ Reset min/max
Description	Selec reset	t the measured variable for which the minimum value and maximum value are to be .
Selection	Canc	el

# 4.6.2 "Electronics temperature" submenu

Navigation

Diagnostics  $\rightarrow$  Tracking pointer  $\rightarrow$  Electronics temp

► Electronics temperature	
Minimum value	→ 🗎 48
Maximum value	) → 🗎 48

Minimum value	
Navigation	□ Diagnostics $\rightarrow$ Tracking pointer $\rightarrow$ Electronics temp $\rightarrow$ Minimum value
Description	Displays the lowest electronics temperature measured so far. Additional information: The unit of measure is specified in the "Temperature unit" parameter.
User interface	Signed floating-point number
Maximum value	
Navigation	□ Diagnostics $\rightarrow$ Tracking pointer $\rightarrow$ Electronics temp $\rightarrow$ Maximum value
Description	Displays the highest electronics temperature measured so far. Additional information: The unit of measure is specified in the "Temperature unit" parameter.
User interface	Signed floating-point number

#### "Application" menu 5

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

Navigation	Application	
Application		
	► Measured values	→ 🖺 49
	► System units	→ 🗎 52
	► Totalizers	→ 🗎 55
	► Sensor	→ 🗎 59
	► Status input	→ 🗎 70
	► Pulse/switch output 1 to n	→ 🗎 71
	► Data logging	→
	► Measured value supervision	→ 🗎 79

#### "Measured values" submenu 5.1

Navigation

Application  $\rightarrow$  Measured values

► Measured values		
Volume flow	→ 🗎 50	
Conductivity	→ 🗎 50	
Flow velocity	→ 🗎 50	
Pressure	→ 🗎 50	
► Totalizer	→ 🗎 51	

Volume flow		
Navigation	$\square \qquad \text{Application} \rightarrow \text{Measured values} \rightarrow \text{Volume flow}$	
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	$\square \qquad \text{Application} \rightarrow \text{Measured values} \rightarrow \text{Conductivity}$	
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	
Flow velocity		
Navigation	$\square \qquad \text{Application} \rightarrow \text{Measured values} \rightarrow \text{Flow velocity}$	
Description	Displays the flow velocity currently measured.	
	Additional information: The applicable unit of measure is specified in the "System units" submenu.	
User interface	Signed floating-point number	
Pressure		
Navigation	$\square \qquad \text{Application} \rightarrow \text{Measured values} \rightarrow \text{Pressure}$	
Description	Displays the pressure currently measured.	
	Additional information: The applicable unit of measure is specified in the "System units" submenu.	
User interface	Signed floating-point number	

## 5.1.1 "Totalizer" submenu

Navigation 🛛 App

Application  $\rightarrow$  Measured values  $\rightarrow$  Totalizer

► Totalizer			
	Totalizer value 1 to n	]	→ 🖺 51
	Totalizer overflow 1 to n	]	→ 🖺 51

Totalizer value 1 to n	
Navigation	□ Application $\rightarrow$ Measured values $\rightarrow$ Totalizer $\rightarrow$ Totalizer val. 1 to n
Description	Displays the current totalizer counter.
	Additional information: Since the operating tool cannot display figures with more than 7 digits, the current counte above this range equals the sum of the totalizer counter plus the overflow displayed for the "Totalizer overflow" parameter.
	Example for how to calculate the current totalizer counter when the value exceeds the 7 digit display range limit of the operating tool: - Value of "Totalizer value " parameter: 1,968,457 m <sup>3</sup> - Value of "Totalizer overflow " parameter: 1 × 107 m <sup>3</sup> = 10,000,000 m <sup>3</sup> - Current totalizer reading: 11,968,457 m <sup>3</sup>
	In the event of an error, the totalizer behaves as specified in the "Failure mode" parameter.
User interface	Signed floating-point number

### Totalizer overflow 1 to n

Navigation	$\square \qquad \text{Application} \rightarrow \text{Measured values} \rightarrow \text{Totalizer} \rightarrow \text{Tot. overflow 1 to n}$
Description	Displays the current totalizer overflow.
	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.
	Example of how to calculate the current totalizer counter when the value exceeds the 7 digit display limit of the operating tool: - Value of "Totalizer value " parameter: 1,968,457 m <sup>3</sup> - Value of "Totalizer overflow " parameter: 1 × 10^7 m <sup>3</sup> = 10,000,000 m <sup>3</sup> - Current totalizer reading: 11,968,457 m <sup>3</sup>
User interface	-32 000.0 to 32 000.0

A

# 5.2 "Units" submenu



Volume flow unit		Â
Navigation	□ Application $\rightarrow$ System units $\rightarrow$ Volume flow unit	
Description	Select volume flow unit.	

#### Endress+Hauser

- SI units •  $cm^3/s$
- cm<sup>3</sup>/min
- $cm^3/h$
- $cm^3/d$
- dm<sup>3</sup>/s
- dm<sup>3</sup>/min
- $dm^3/h$
- $dm^3/d$
- m<sup>3</sup>/s
- m<sup>3</sup>/min
- $m^3/h$
- $m^3/d$
- ml/s
- ml/min
- ml/h
- ml/d
- 1/s
- I/min
- l/h
- 1/d
- hl/s
- hl/min
- hl/h
- hl/d
- Ml/s
- Ml/min
- Ml/h
- Ml/d

- US units af/s
- af/min
- af/h
- af/d
- $ft^3/s$
- ft<sup>3</sup>/min
- $ft^3/h$
- $ft^3/d$
- MMft<sup>3</sup>/s
- MMft<sup>3</sup>/min
- MMft<sup>3</sup>/h
- Mft<sup>3</sup>/d
- fl oz/s (us)
- fl oz/min (us)
- fl oz/h (us)
- fl oz/d (us)
- gal/s (us)
- gal/min (us)
- gal/h (us)
- gal/d (us)
- Mgal/s (us)
- Mgal/min (us)
- Mgal/h (us)
- Mgal/d (us)
- bbl/s (us;liq.)
- bbl/min (us;liq.)
- bbl/h (us;liq.)
- bbl/d (us;liq.)
- bbl/s (us;beer)
- bbl/min (us;beer)
- bbl/h (us;beer)
- bbl/d (us;beer)
- bbl/s (us;oil)
- bbl/min (us;oil)
- bbl/h (us;oil)
- bbl/d (us:oil)
- bbl/s (us;tank)
- bbl/min (us;tank)
- bbl/h (us;tank)
- bbl/d (us;tank)
- kqal/s (us)
- kqal/min (us)
- kgal/h (us)
- kqal/d (us)

Volume unit

Navigation

Application  $\rightarrow$  System units  $\rightarrow$  Volume unit

Description

Endress+Hauser

Select volume unit.

A

53

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

- dm<sup>3</sup>
  - m<sup>3</sup> • ml

SI units

■ cm<sup>3</sup>

- **-** 1
- ∎ hl
- Ml Mega
- ∎ af ■ ft<sup>3</sup> Mft<sup>3</sup> • fl oz (us) • gal (us) kgal (us)Mgal (us) bbl (us;oil) bbl (us;liq.) bbl (us;beer) bbl (us;tank)

US units

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

Conductivity unit		Â
Navigation	□ Application $\rightarrow$ System units $\rightarrow$ Conductiv. unit	
Description	Select conductivity unit.	
Selection	SI units = nS/cm = μS/cm = μS/m	

- µS/mmmS/m
- mS/cm
- S/cm
- S/m
- kS/m
- MS/m

Temperature unit			£
Navigation	$\Box  Application \rightarrow System$	units $\rightarrow$ Temperature unit	
Description	Select temperature unit.		
Selection	SI units ■ °C ■ K	US units ■ °F ■ °R	

Pressure unit		
Navigation	□ Application $\rightarrow$ System units $\rightarrow$ Pressure unit	
Description	Select process pressure unit.	

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

# 5.3 "Totalizers" submenu

Navigation		
► Totalizers		
	► Totalizer handling	→ 🗎 55
	► Totalizer 1 to n	→ 🗎 56

# 5.3.1 "Totalizer handling" submenu

Navigation		Application $\rightarrow$ Totalizers $\rightarrow$ Totalizer	
► Totalizer hand	dling		
	Reset a	l totalizers	→ 🗎 55

Reset all totalizers	
Navigation	□ Application $\rightarrow$ Totalizers $\rightarrow$ Totalizer $\rightarrow$ Reset all tot.
Description	Reset all totalizers to "0" and restart the totaling process. All flow quantities thus far totalized are thereby deleted.
Selection	<ul><li>Cancel</li><li>Reset + totalize</li></ul>

## 5.3.2 "Totalizer 1 to n" submenu

Navigation  $\square$  Application  $\rightarrow$  Totalizers  $\rightarrow$  Totalizer 1 to n



Assign process variable		
Navigation	Application $\rightarrow$ Totalizers $\rightarrow$ Totalizer 1 to n $\rightarrow$ Assign variable	

5	
Description	Select process variable for totalizer.
	Additional information: If the option selected is changed, the device resets the totalizer to "0".
Selection	<ul><li>Off</li><li>Volume flow</li></ul>

Unit totalizer 1 to n	

Navigation		Application $\rightarrow$ Totalizers $\rightarrow$ Totalizer 1 to n $\rightarrow$ Unit totalizer 1 to n
Description	Select	process variable totalizer unit.



None<sup>\*</sup>

\*

Visibility depends on order options or device settings

Totalizer operation mode		ß
Navigation	□ Application $\rightarrow$ Totalizers $\rightarrow$ Totalizer 1 to n $\rightarrow$ Operation mode	
Description	Select totalizer calculation mode.	
Selection	<ul><li>Net flow total</li><li>Forward flow total</li><li>Reverse flow total</li></ul>	
Additional information	<ul> <li>Selection</li> <li>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.</li> <li>Forward flow total option Only the flow in the forward flow direction is totalized.</li> <li>Reverse flow total option Only the flow in the reverse flow direction is totalized (= reverse flow quantity).</li> </ul>	

Control Totalizer 1 to n		
Navigation		Application $\rightarrow$ Totalizers $\rightarrow$ Totalizer 1 to n $\rightarrow$ Control Tot. 1 to n
Description	Opera	te the totalizer.

Selection	<ul> <li>Totalize</li> <li>Reset + hold</li> <li>Preset + hold</li> <li>Reset + totalize</li> <li>Hold</li> </ul>
Additional information	Selection
	<ul> <li>Totalize option The totalizer is started or continues running.</li> <li>Reset + hold option The totaling process is stopped and the totalizer is reset to "O".</li> <li>Preset + hold option The totaling process is stopped and the totalizer is set to the start value specified in the "Preset value " parameter.</li> <li>Reset + totalize option The totalizer is reset to "O" and the totaling process is restarted.</li> <li>Hold option Totalizing is stopped.</li> </ul>

Preset value 1 to n	
Navigation	□ Application $\rightarrow$ Totalizers $\rightarrow$ Totalizer 1 to n $\rightarrow$ Preset value 1 to n
Description	Specify start value for totalizer.
User entry	Signed floating-point number
Failure mode	۵
Navigation	□ Application $\rightarrow$ Totalizers $\rightarrow$ Totalizer 1 to n $\rightarrow$ Failure mode
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> <li>Stop</li> </ul>

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.

# 5.4 "Sensor" submenu

Navigation		
► Sensor		
	► Process parameters	→ 🗎 59
	► Low flow cut off	→ 🗎 61
	► Empty pipe detection	→ 🗎 62
	► Sensor adjustment	→ 🗎 65
	► Calibration	→ 🗎 68

# 5.4.1 "Process parameters" submenu

*Navigation*  $\square$  Application  $\rightarrow$  Sensor  $\rightarrow$  Process param.

► Process parameters	
Flow damping	) → 🗎 60
Flow damping time	) → 🗎 60
Flow override	] → 🗎 60
Conductivity measurement	) → 🗎 61
Conductivity damping time	] → 🗎 61

Flow damping	ß
Navigation	$ \qquad \qquad \text{Application} \rightarrow \text{Sensor} \rightarrow \text{Process param.} \rightarrow \text{Flow damping} $
Description	Enter value for damping of the flow measured value in order to reduce the variability of the flow measured value when exposed to interference.
	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. - 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
	Optimal damping depends on the measuring period.
	Damping impacts the following measuring device variables: - Outputs - Low flow cut off - Totalizers
User entry	0 to 15

Flow damping time		A
Navigation	□ Application $\rightarrow$ Sensor $\rightarrow$ Process param. $\rightarrow$ FlowDampingTime	
Description	Enter time constant for flow 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 99.9 s	
Flow override		
Navigation	□ Application $\rightarrow$ Sensor $\rightarrow$ Process param. $\rightarrow$ Flow override	
Description	Stops the measuring process. Can be used for example when cleaning the pipeline.	
Selection	<ul><li>Off</li><li>On</li></ul>	

### Additional information Selection

### "On" option

Activates flow override. The diagnostic message "453 Flow override active" is generated.

Additional information:

Output values:

- Temperature: Measurement continues
- Totalizers 1 to 3: No longer totalize

Conductivity measurement		
Navigation	□ Application $\rightarrow$ Sensor $\rightarrow$ Process param. $\rightarrow$ Conduct. measur.	
Description	Switch conductivity measurement on or off.	
	Additional information: To be able to measure conductivity, the medium must have a minimum conductivity of $\mu\text{S/cm}.$	f 5
Selection	<ul><li>Off</li><li>On</li></ul>	

Conductivity damping	time
Navigation	□ Application $\rightarrow$ Sensor $\rightarrow$ Process param. $\rightarrow$ ConductDampTime
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

### 5.4.2 "Low flow cut off" submenu

 Navigation
  $\square$  Application  $\rightarrow$  Sensor  $\rightarrow$  Low flow cut off

 Low flow cut off
  $\rightarrow \boxdot 62$ 

Â

On value low flow cutoff	→ 🗎 62
Off value low flow cutoff	→ 🗎 62

Low flow cut off		
Navigation	$ \qquad \qquad \text{Application} \rightarrow \text{Sensor} \rightarrow \text{Low flow cut off} \rightarrow \text{Low flow cut off} $	
Description	Select process variable for low flow cut off to activate low flow cut off.	
Selection	<ul><li>Off</li><li>Volume flow</li></ul>	

On value low flow cutoff		<b>a</b>
Navigation	$ \qquad \qquad$	
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 $\rightarrow$ Sensor $\rightarrow$ Low flow cut off $\rightarrow$ Off value
Description	Enter hyster	off value to switch off low flow cut off. The off value is entered as a positive resis with respect to the on value.
User entry	0 to 1	00.0 %

# 5.4.3 "Empty pipe detection" submenu

Navigation

[	► Empty pipe detection	
	Empty pipe detection	→ 🗎 63

A

Switch point empty pipe detection		→ 🖺 63
New adjustment	]	→ 🖺 63
Progress		→ 🖺 64
Empty pipe adjust value	]	→ 🖺 64
Full pipe adjust value	]	→ 🖺 64
Measured value EPD		→ 🖺 64

Empty pipe detection		ß
Navigation		
Description	Switch empty pipe detection on or off. Switch on empty pipe detection to detect a partia filled or empty measuring tube.	ılly
Selection	<ul><li>Off</li><li>On</li></ul>	

Switch point empty pipe detection		ß
Navigation	□ Application $\rightarrow$ Sensor $\rightarrow$ Empty pipe det. $\rightarrow$ Switch point EPD	
Description	Enter hysteresis in % below which the measuring tube will be detected as empty.	
User entry	0 to 100 %	
New adjustment		
Navigation	□ Application $\rightarrow$ Sensor $\rightarrow$ Empty pipe det. $\rightarrow$ New adjustment	
Description	Select empty pipe or full pipe adjustment to perform a new adjustment. To adjust empipe detection, perform the empty pipe adjustment first and then the full pipe adjus Additional information: The measuring device is pre-adjusted at production using water (approx. $300 \mu$ S/cm liquids that deviate from this conductivity, a new empty pipe and full pipe adjustment be performed on site.	npty tment. 1). For nt must
Selection	<ul> <li>Cancel</li> <li>Empty pipe adjust</li> <li>Full pipe adjust</li> </ul>	

A

Progress	
Navigation	□ Application → Sensor → Empty pipe det. → Progress
Description	Shows the progress of the process.
User interface	<ul><li>Ok</li><li>Busy</li><li>Not ok</li></ul>

Empty pipe adjust value		

Navigation	$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$
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	$ \qquad \qquad$	
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 $\rightarrow$ Sensor $\rightarrow$ Empty pipe det. $\rightarrow$ Meas. value EPD	
Description	Displays the value currently measured for empty pipe detection.	
User interface	Positive floating-point number	

# 5.4.4 "Sensor adjustment" submenu

Navigation

Application  $\rightarrow$  Sensor  $\rightarrow$  Sensor adjustm.

► Sensor adjustment	
Installation direction	→ 🗎 65
Integration time	→ 🗎 65
Measuring period	→ 🗎 66
Measuring interval mode	→ 🗎 66
Current measuring interval	→ 🗎 66
Measuring interval value	→ 🗎 67
Energy budget intelligent adaption	) → 🗎 67
Factor pressure measuring interval	→ 🗎 67

Installation direction		
Navigation	□ Application $\rightarrow$ Sensor $\rightarrow$ Sensor adjustm. $\rightarrow$ Install. direct.	
Description	Select sign of flow direction	
Selection • Forward flow • Reverse flow		

Integration time		
Navigation	$ \qquad \qquad \text{Application} \rightarrow \text{Sensor} \rightarrow \text{Sensor adjustm.} \rightarrow \text{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		A
Navigation	□ Application $\rightarrow$ Sensor $\rightarrow$ Sensor adjustm. $\rightarrow$ 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 1000 ms	
Measuring interval mode		
Navigation	$ \qquad \qquad \text{Application} \rightarrow \text{Sensor} \rightarrow \text{Sensor} \text{ adjustm.} \rightarrow \text{MeasurIntervMod} $	
Description	Select measuring interval mode. The measuring interval is the time span between two measuring periods.	
Selection	<ul><li>Fixed value</li><li>Intelligent adaptation</li></ul>	
Additional information	Selection	
	• Fixed value option The measuring interval is specified in the "Measuring interval value" parameter. This option is recommended to optimize battery lifetime.	
	• Intelligent adaptation option Under normal process conditions, the measuring device measures according to the measuring interval specified in the "Measuring interval value" parameter. If the process conditions change, the measuring device measures in shorter intervals according to th usage rate specified in the "Energy budget intelligent adaption" parameter. This option recommended to optimize the measuring result.	; e is

Current measuring interval				
Navigation		Application $\rightarrow$ Sensor $\rightarrow$ Sensor adjustm. $\rightarrow$ Cur.meas.interv.		
Description	Shows	s the measuring interval currently used.		
User interface	Positiv	ve floating-point number		

Measuring interval value	9	
Navigation	□ Application $\rightarrow$ Sensor $\rightarrow$ Sensor adjustm. $\rightarrow$ Meas.interv.val.	
Description	Enter the value for the measuring interval. Additional information: To increase battery life, set as long an interval as possible. To optimize the measuring	
User entry	result, set as short an interval as possible. O to 60 s	
Energy budget intelligen	t adaption	
Navigation	$ \  \   \square \  \   \   \   \   \   $	
Description	<ul> <li>Set the energy budget.</li> <li>Additional information: <ul> <li>Value = 100%: Energy budget usage is maximized. The measuring device adapts the measuring interval to flow changes frequently.</li> <li>Value = 50%: Mean energy budget usage. The measuring device adapts the measuring interval to flow changes at a frequency that requires half as much energy as when usage the energy budget is maximized.</li> <li>Value = 1%: Low energy budget usage. The measuring device does not frequently adapted the measuring interval to flow changes.</li> </ul> </li> </ul>	ıg ge of apt
	NOTE The higher the energy budget usage, the shorter the battery life span!	

User entry 1 to 100 %

Factor pressure measuring interval		
Navigation	□ Application $\rightarrow$ Sensor $\rightarrow$ Sensor adjustm. $\rightarrow$ FactMeasurInterv	
Description	Enter factor for pressure measuring interval as a multiple of the measuring interval. To increase battery life, enter as large of a factor as possible.	
	Example: "Measuring interval value" parameter value = 15 s "Factor pressure measuring interval" parameter value = 10 Pressure measuring interval = 150 s	
User entry	0 to 65 535	

# 5.4.5 "Calibration" submenu





Nominal diameter		·				
Navigation	□ Application $\rightarrow$ Sensor $\rightarrow$ Calibration $\rightarrow$ 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 $\rightarrow$ Sensor $\rightarrow$ Calibration $\rightarrow$ 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 $\rightarrow$ Sensor $\rightarrow$ Calibration $\rightarrow$ 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

#### æ

Navigation	□ Application $\rightarrow$ Sensor $\rightarrow$ Calibration $\rightarrow$ Cond. cal. fact.
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

# 5.4.6 "Supervision" submenu

Navigation

► Supervision		
Conductivity	→ 🗎 69	
Process pressure	→ 🗎 69	

Conductivity							
Navigation	$\Box \qquad \text{Application} \rightarrow \text{Sensor} \rightarrow \text{Supervision} \rightarrow \text{Conductivity}$						
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						
Process pressure							
Navigation							
Description	Displays the currently measured process pressure.						
User interface	Signed floating-point number						

#### 5.4.7 "Properties" submenu

Navigation	$\square \qquad \text{Application} \rightarrow \text{Sensor} \rightarrow \text{Properties}$	
► Properties		
	EPD electrode existing	→ 🗎 70

### EPD electrode existing

Navigation		Application $\rightarrow$ Sensor $\rightarrow$ Properties $\rightarrow$ EPD electrode
Description	Shows	s whether the empty pipe detection electrode exists.
User interface	■ No ■ Yes	

Navigation

#### 5.5 "Status input" submenu

Navigation		
► Status input		
	Assign status input	→ 🗎 70
	Value status input	→ 🗎 71
	Response time status input	→ 🗎 71

Assign status input		A
Navigation	□ Application $\rightarrow$ Status input $\rightarrow$ Assign stat.inp.	
Description	Assign a function to the status input.	
	Additional information: Ensure the "Off" option is selected, before enabling the measuring device for custody transfer.	
Selection	<ul> <li>Off</li> <li>Reset totalizer 1</li> <li>Reset totalizer 2</li> </ul>	

	<ul> <li>Reset totalizer 3</li> <li>Reset all totalizers</li> <li>Generate logbook entry</li> </ul>					
Additional information	Selection					
	<b>"Generate logbook entry" option</b> If the condition of the status input changes, a logbook entry is created.					
Value status input						
Navigation	□ Application $\rightarrow$ Status input $\rightarrow$ Val.stat.inp.					
Description	Indicates the current input signal level.					
	Additional information: When a voltage is applied to the status input, the signal level indicates "High". Otherwise it indicates "Low".					
User interface	<ul><li>High</li><li>Low</li></ul>					

Response time status input			
Navigation	$\Box \qquad \text{Application} \rightarrow \text{Status input} \rightarrow \text{Response time}$		
Description	Specify the minimum amount of time the input signal level must be present before the selected function is triggered.		
User entry	50 to 200 ms		

# 5.6 "Pulse/switch output 1 to n" submenu

Configuring the pulse/frequency/switch output

Navigation	Application $\rightarrow$ Pulse/switch 1 to n

► Pulse/switch output 1 to n				
Operating mode	→ 🗎 72			
Assign pulse output 1 to n	→ 🗎 73			
Measuring mode	→ 🗎 73			

Switch output function	→ 🗎 74
Assign diagnostic behavior	→ 🗎 74
Assign limit	→ 🗎 75
Assign status	→ 🗎 75
Value per pulse	→ 🗎 75
Pulse width	→ 🗎 76
Failure mode	→ 🗎 76
Switch-on value	→ 🗎 77
Switch-off value	→ 🗎 77
Failure mode	→ 🗎 77
Assign flow direction check	→ 🗎 78
Switch state 1 to n	→ 🗎 78

Operating mode		
Navigation	□ Application $\rightarrow$ Pulse/switch 1 to n $\rightarrow$ Operating mode	
Description	Set the output mode to pulse or switch.	
Selection	<ul> <li>Pulse</li> </ul>	

Switch
Additional information	Selection
	<ul> <li>Pulse option         Quantitatively proportional pulse with pulse width to be configured. Whenever a specific volume has been reached (pulse value), a pulse is emitted, the duration of which is set within the "Pulse width" parameter.     </li> <li>Switch option</li> </ul>
	Indicates when the state of the device changes, e.g. when a specified limit value is reached. Additional information:
	<ul> <li>The switch output can be in one of two states: either it is conductive or it is non- conductive.</li> </ul>
	<ul> <li>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 or, in case of battery-operated devices, it will emit a pulse, i.e. the switch output will be closed and conductive for the duration of the pulse.</li> <li>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.</li> </ul>

Assign pulse output 1 to n			Â
Navigation		Application $\rightarrow$ Pulse/switch 1 to n $\rightarrow$ Assign pulse 1 to n	
Description	Select	process variable for pulse output.	
Selection	<ul><li>Off</li><li>Volt</li></ul>	ume flow	

Measuring mode		Â
Navigation	$\Box \qquad \text{Application} \rightarrow \text{Pulse/switch 1 to n} \rightarrow \text{Measuring mode}$	
Description	Select measuring mode for pulse output.	
Selection	<ul><li>Forward flow</li><li>Forward/Reverse flow</li><li>Reverse flow</li></ul>	
Additional information	Selection	
	<ul> <li>Forward flow option For positive flow a pulse is emitted, for negative flow not. </li> <li>Forward/Reverse flow option For both positive and negative flow a pulse is emitted (absolute value), whereby no distinction is made between positive and negative flow. </li> <li>Reverse flow option</li> </ul>	

**Reverse flow** option For negative flow a pulse is emitted, for positive flow not.

Switch output function	
Navigation	□ Application $\rightarrow$ Pulse/switch 1 to n $\rightarrow$ Switch out funct
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 b inverted in the "Invert output signal" parameter - The "Invert output signal" parameter is not available for all devices.
Selection	<ul> <li>Off</li> <li>On</li> <li>Diagnostic behavior</li> <li>Limit</li> <li>Flow direction check</li> <li>Status</li> </ul>
Additional information	Selection
	<ul> <li>Off option The switch output is permanently switched off (open, non-conductive).</li> <li>On option The switch output is permanently switched on (closed, conductive).</li> <li>Diagnostic behavior option Emits a pulse if there is a pending diagnostic event of the assigned behavioral category</li> <li>Limit option Emits a pulse if a limit value specified for the process variable has been reached.</li> <li>Flow direction check option Emits a pulse when the flow direction changes.</li> <li>Status option Emits a pulse to indicate the device status for empty pipe detection or low flow cut off, whichever option is assigned to the switch output.</li> </ul>

Assign diagnostic behavio	r	
Navigation	□ Application $\rightarrow$ Pulse/switch 1 to n $\rightarrow$ Assign diag. beh	
Description	Select the diagnostic behavior for which the switch output should emit a pulse.	
Selection	<ul><li>Alarm</li><li>Alarm or warning</li><li>Warning</li></ul>	
Additional information	Selection	
	<ul> <li>Alarm option The switch output only emits a pulse for diagnostic events of the "Alarm" category.</li> <li>Alarm or warning option The switch output emits a pulse for diagnostic events of the "Alarm" or "Warning" category.</li> <li>Warning option The switch output only emits a pulse for diagnostic events of the "Warning" category.</li> </ul>	

Assign limit	ß
Navigation	$ Pulse/switch 1 to n \rightarrow Assign limit $
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 emits a pulse.
Selection	<ul> <li>Off</li> <li>Volume flow</li> <li>Flow velocity</li> <li>Conductivity*</li> <li>Totalizer 1</li> <li>Totalizer 2</li> <li>Totalizer 3</li> <li>Pressure*</li> <li>Battery state of charge</li> </ul>

Assign status		ß
Navigation	Application $\rightarrow$ Pulse/switch 1 to n $\rightarrow$ Assign status	
Description	Select the device status to display for the switch output.	
	Additional information: If the switch on point for empty pipe detection / low flow cut off is reached, the output conductive. Otherwise, the switch output is non-conductive.	t is
Selection	<ul><li>Empty pipe detection</li><li>Low flow cut off</li></ul>	

Value per pulse		
Navigation	□ Application $\rightarrow$ Pulse/switch 1 to n $\rightarrow$ Value per pulse	
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	
	<ul> <li>better the resolution.</li> </ul>	
	– higher the frequency of the pulse response.	
User entry	Signed floating-point number	

<sup>\*</sup> Visibility depends on order options or device settings

Pulse width	
Navigation	□ Application $\rightarrow$ Pulse/switch 1 to n $\rightarrow$ Pulse width
Description	Specify the duration of the output pulse.
	Additional information: The maximum pulse rate is defined by fmax = $1 / (2 \times \text{pulse width})$ . The interval between two pulses (P) is at least as long as the specified pulse width (B). The maximum flow is defined by Qmax = fmax × 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 - fmax: 1 / (2 × 0.1 ms) = 5 kHz - Qmax: 5 kHz × 0.1 g = 0.5 kg/s
User entry	0.1 to 500 ms
Failure mode	
Navigation	□ Application $\rightarrow$ Pulse/switch 1 to n $\rightarrow$ Failure mode
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><li>Actual value</li><li>No pulses</li></ul>

Additional information

Actual value option

Selection

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, the pulse output is switched off.

Switch-on value		Ē
Navigation	$ \qquad \qquad \text{Application} \rightarrow \text{Pulse/switch 1 to n} \rightarrow \text{Switch-on value} $	
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	$ \qquad \qquad \text{Application} \rightarrow \text{Pulse/switch 1 to } n \rightarrow \text{Switch-off value} $	
Description	Enter limit value for the switch-off point (process variable < switch-off value = open, no conductive).	)n-
	Additional information: To use a hysteresis: Switch-on point > Switch-off point.	
User entry	Signed floating-point number	
Failure mode		
Navigation	$\square \qquad \text{Application} \rightarrow \text{Pulse/switch 1 to n} \rightarrow \text{Failure mode}$	
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><li>Actual status</li><li>Open</li><li>Closed</li></ul>	

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".

# Assign flow direction check Image: Constraint of the system of the

#### Switch state 1 to n

Navigation	□ Application $\rightarrow$ Pulse/switch 1 to n $\rightarrow$ Switch state 1 to n
Description	Indicates the current switch output status.
User interface	<ul><li>Open</li><li>Closed</li></ul>
Additional information	User interface
	<ul> <li>Open option The switch output is not conductive.</li> <li>Closed option The switch output is conductive.</li> </ul>

# 5.7 "Custody transfer" submenu

For detailed information on the parameter descriptions for "custody transfer", see the Special Documentation for the device

## 5.8 "Data logging" submenu

Navigation

Application  $\rightarrow$  Data logging

► Data logging	
Log interval	79
Reference time log interval	79

Log interval		Â
Navigation	$\square \qquad \text{Application} \rightarrow \text{Data logging} \rightarrow \text{Log interval}$	
Description	Select the interval at which to log measured values.	
Selection	<ul> <li>15 seconds</li> <li>30 seconds</li> <li>1 minute</li> <li>5 minutes</li> <li>10 minutes</li> <li>15 minutes</li> <li>30 minutes</li> <li>1 hour</li> <li>2 hours</li> <li>4 hours</li> <li>6 hours</li> <li>12 hours</li> <li>24 hours</li> </ul>	

Reference time log interval	
Navigation	□ Application $\rightarrow$ Data logging $\rightarrow$ IntervalRefTime
Description	Enter the reference time to which the log interval for data logging refers. Data is logged at this time. Additional information: The measured value log entry times (3) derive from the reference time specified (1) and the log interval (2).
User entry	Positive integer

# 5.9 "Measured value supervision" submenu

NavigationApplication  $\rightarrow$  MeasValSupervis. $\blacktriangleright$  Measurement value supervision $\land$   $\square$  80Maximum flow limit $\rightarrow$   $\square$  80Minimum flow limit $\rightarrow$   $\square$  80Maximum pressure limit $\rightarrow$   $\square$  80Minimum pressure limit $\rightarrow$   $\square$  81Maximum flow limit time span $\rightarrow$   $\square$  81

Minimum flow limit time span	→ 🗎 81	
Maximum pressure limit time span	→ 🖺 81	
Minimum pressure limit time span	→ 🗎 82	
Start time	→ 🖺 82	
End time	→ 🗎 82	

Upper flow limit value		ß
Navigation	□ Application $\rightarrow$ MeasValSupervis. $\rightarrow$ Upper flow limit	
Description	Enter the upper flow limit value to monitor the flow. If the flow is greater than the specified limit value, the measuring device generates a diagnostic message.	
User entry	Signed floating-point number	
Lower flow limit value		Â
Navigation		
Description	Enter the lower flow limit value to monitor the flow. If the flow is less than the specified limit value, the measuring device generates a diagnostic message.	l
User entry	Signed floating-point number	
Upper pressure limit value		£
Navigation		
Description	Enter the upper pressure limit value to monitor the pressure. If the pressure is higher the the specified limit value, the measuring device generates a diagnostic message.	an

User entry Positive floating-point number

Lower pressure limit value			
Navigation		Application $\rightarrow$ MeasValSupervis. $\rightarrow$ LowPressureLimit	
Description	Enter the sp	the lower pressure limit value to monitor the pressure. If the pressure is lower recified limit value, the measuring device generates a diagnostic message.	than
User entry	Positi	ve floating-point number	

Time-dependent u	Time-dependent upper flow limit value	
Navigation	$ \qquad \qquad$	
Description	Enter an upper flow limit value to monitor the flow for the specified time span. within the specified time span is greater than the specified limit value, the mea device generates a diagnostic message.	If the flow suring
	Additional information: The applicable time period is specified using the "Start time time-dependent lim and the "End time time-dependent limit values" parameters.	ut values"
User entry	Signed floating-point number	

Time-dependent lov	Time-dependent lower flow limit value	
Navigation	□ Application $\rightarrow$ MeasValSupervis. $\rightarrow$ TimedepLowerFlow	
Description	Enter a lower flow limit value to monitor the flow for the specified time span. If within the specified time span is less than the specified limit value, the measuring generates a diagnostic message.	the flow ng device
	Additional information: The applicable time period is specified using the "Start time time-dependent limi and the "End time time-dependent limit values" parameters.	t values"
User entry	Signed floating-point number	

Гіme-depen. upper pressure limit value		A
Navigation	□ Application $\rightarrow$ MeasValSupervis. $\rightarrow$ TimedepUppPress	
Description	Enter an upper pressure limit value to monitor the pressure for the specified time sp the pressure within the specified time span is higher than the specified limit value, t measuring device generates a diagnostic message.	oan. If the
	Additional information: The applicable time period is specified using the "Start time time-dependent limit va and the "End time time-dependent limit values" parameters.	lues"

#### User entry

Positive floating-point number

Time-depen. lower pressure limit value	

Navigation	$\square \qquad \text{Application} \rightarrow \text{MeasValSupervis.} \rightarrow \text{TimedepLowPress}$
Description	Enter the lower pressure limit value to monitor the pressure for the specified time span. If the pressure within the specified time span is lower than the specified limit value, the measuring device generates a diagnostic message.
	Additional information: The applicable time period is specified using the "Start time time-dependent limit values" and the "End time time-dependent limit values" parameters.
User entry	Positive floating-point number

#### Start time time-dependent limit values

Navigation	$\square \qquad Application \rightarrow MeasValSupervis. \rightarrow StartTime limits$
Description	Enter the start time for the time period that applies to the time-dependent flow and pressure limit values.
User entry	Positive integer

#### End time time-dependent limit values

Navigation	
Description	Enter the end time for the time period that applies to the time-dependent flow and pressure limit values.
User entry	Positive integer

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# "System" menu

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

Navigation	System	
System		
	► Device management	→ 🗎 83
	► User management	→ 🖺 86
	► Connectivity	→ 🖺 88
	► Date/time	→ 🗎 105
	► Geolocation	→ 🗎 107
	► Power management	→ 🗎 108
	► Information	→ 🗎 110
	► Display	→ 🗎 116
	► Software configuration	→ 🗎 119

#### "Device management" submenu 6.1

Navigation C

System → Device manag	J.
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► Device management		
Device tag	→ 🗎 84	
Locking status	→ 🖺 84	
Configuration counter	→ 🖺 84	
Device reset	→ 🗎 85	

Device tag		Ê
Navigation	System $\rightarrow$ Device manag. $\rightarrow$ 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	<ul> <li>Hardware locked</li> <li>CT active - defined parameters</li> <li>CT active - all parameters</li> <li>Temporarily locked</li> </ul>	
Additional information	User interface	
	<ul> <li>Hardware locked option The DIP switch for the hardware lock is enabled. As a result write access to the parameters is locked.</li> <li>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 modified again, once the internal procedures are complete.</li> </ul>	l, be

#### Configuration counter

Navigation	System $\rightarrow$ Device manag. $\rightarrow$ Config. counter
Description	<ul> <li>Displays the counter for changes to the device parameters.</li> <li>Additional information: <ul> <li>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.</li> <li>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.</li> <li>Once the counter has reached the value 65535, it restarts at 0.</li> </ul> </li> </ul>
User interface	0 to 65 535

Device reset	
Navigation	$ \qquad \qquad$
Description	Reset the device configuration - either entirely or in part - to a defined state.
Selection	<ul> <li>Cancel</li> <li>To delivery settings</li> <li>Restart device</li> <li>Restore S-DAT backup *</li> <li>Shut down device</li> <li>Create T-DAT backup *</li> <li>Restore T-DAT backup *</li> </ul>
Additional information	Selection
	<ul> <li>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.</li> <li>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.</li> <li>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.</li> <li>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</li> <li>The powerfail data and device delivery settings will no longer be available on performing this delete operation!</li> <li>Reset faulty parameters to default values when the following memory content error occurs: "283 Memory content inconsistent" with Service ID 367. Additional information:</li> </ul>

<sup>\*</sup> Visibility depends on order options or device settings

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!

System  $\rightarrow$  User manag.

- **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.

Navigation

## 6.2 "User management" submenu

► User management	
User role	→ 🗎 86
Enter access code	→ 🗎 87
Reset Maintenance code	→ 🗎 87
► Define Maintenance code	→ 🗎 87

User	role	
Ober	1010	

Navigation	□ System $\rightarrow$ User manag. $\rightarrow$ 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	<ul> <li>Operator</li> <li>Maintenance</li> <li>Service</li> <li>Production</li> <li>Development</li> </ul>

Additional information	User interface
	<ul> <li>Operator option</li> </ul>
	Provides only read access to parameters.
	<ul> <li>Maintenance option</li> </ul>
	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 $\rightarrow$ User manag. $\rightarrow$ 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 entry	0 to 9999

Reset Maintenance code	
Navigation	□ System $\rightarrow$ User manag. $\rightarrow$ 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)

#### 6.2.1 "Define access code" wizard

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

Navigation $\Box$ System  $\rightarrow$  User manag.  $\rightarrow$  Def. access code

► Define Maintenance code		
Define N	Naintenance code	→ 🗎 88
Confirm	Maintenance code	→ 🗎 88

ß

Define Maintenance code		8
Navigation		System $\rightarrow$ User manag. $\rightarrow$ Def. Maint. code $\rightarrow$ Def. Maint. code
Description	Spec	fy 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 $\rightarrow$ User manag. $\rightarrow$ Def. Maint. code $\rightarrow$ Conf. Maint code
Description	Confir	m the access code entered for the Maintenance role.
User entry	0 to 9	999

# 6.3 "Connectivity" submenu

Navigation	System → Connectivi	ty
5	5	-



#### 6.3.1 "Bluetooth configuration" submenu

Navigation	System $\rightarrow$ Connectivity $\rightarrow$ Bluetooth conf.
110010900000	

► Bluetooth configuration	
Bluetooth	→ 🗎 89

a

Bluetooth		ß
Navigation	□ System → Connectivity → Bluetooth conf. → Bluetooth	
Description	Enable or disable Bluetooth.	
Selection	<ul> <li>Enable</li> <li>On touch</li> <li>Not available *</li> </ul>	

#### "Cellular radio network" submenu 6.3.2

System  $\rightarrow$  Connectivity  $\rightarrow$  Radio network Navigation

► Cellular radio network				
► Access data	→ 🗎 89			
► DNS configuration	) → 🗎 90			
► Information	) → 🗎 92			

#### "Access data" submenu

Navigation

 $\mathsf{System} \to \mathsf{Connectivity} \to \mathsf{Radio} \ \mathsf{network} \to \mathsf{Access} \ \mathsf{data}$ 

► Access data			
	APN name	]	
	APN user name	]	
	APN password	]	
	Preferred network type	7	

APN name			Ê
Navigation		System $\rightarrow$ Connectivity $\rightarrow$ Radio network $\rightarrow$ Access data $\rightarrow$ APN name	
Description	Enter	the access point name (APN) the cellular service provider uses for your SIM card.	

<sup>\*</sup> Visibility depends on order options or device settings

User entry	Character string comprising numbers, letters and special characters (#32)	
APN user name		
Navigation	□ System → Connectivity → Radio network → Access data → APN user name	
Description	Enter the APN user name the cellular service provider uses for your SIM card.	
User entry	Character string comprising numbers, letters and special characters (#32)	

APN password		8
Navigation	□ System → Connectivity → Radio network → Access data → APN password	
Description	Enter the APN password according to the information provided by the cellular network provider.	
User entry	Character string comprising numbers, letters and special characters (#32)	

Preferred network type		Â
Navigation	□ System → Connectivity → Radio network → Access data → Prefer netw type	
Description	Select the preferred network type to use to connect to a cellular network.	
Selection	<ul> <li>GSM</li> <li>LTEM1</li> <li>LTE-NB-IoT</li> <li>Automatic</li> </ul>	

#### "DNS configuration" submenu

```
Navigation
```

System  $\rightarrow$  Connectivity  $\rightarrow$  Radio network  $\rightarrow$  DNS config.

► DNS configuration				
Port primary NTP server	] → 🗎 91			
URL primary NTP server	] → 🗎 91			
Port secondary NTP server	) → 🗎 91			

URL secondary NTP server	→ 🗎 91
DNS server IP	→ 🗎 92

Port primary NTP server		æ
Navigation	□ System → Connectivity → Radio network → DNS config. → Port NTP server1	
Description	Enter the port of the primary NTP server.	
User entry	0 to 65 535	
URL primary NTP server		ß
Navigation	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$	
Description	Enter the URL of the primary NTP server.	
User entry	Character string comprising numbers, letters and special characters (#100)	
Port secondary NTP server		ß
Navigation	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$	
Description	Enter the port of the secondary NTP server.	
User entry	0 to 65 535	
URL secondary NTP server		Ê

Navigation		System $\rightarrow$ Connectivity $\rightarrow$ Radio network $\rightarrow$ DNS config. $\rightarrow$ URL NTP server 2
Description	Enter	the URL of the secondary NTP server.
User entry	Chara	cter string comprising numbers, letters and special characters (#100)

DNS server IP			ß
Navigation		System $\rightarrow$ Connectivity $\rightarrow$ Radio network $\rightarrow$ DNS config. $\rightarrow$ DNS server IP	
Description	Ente	r the IP address of the DNS server.	
User entry	Char	acter string comprising numbers, letters and special characters (#100)	

#### "Information" submenu

```
Navigation
```

□ System  $\rightarrow$  Connectivity  $\rightarrow$  Radio network  $\rightarrow$  Information

► Information			
	SIM card ICCID	]	→ 🗎 92
	SIM card IMSI		→ 🗎 92
	IMEI cellular radio module		→ 🖺 93
	Received signal strength		→ 🗎 93
	Network type		→ 🖺 93
	Cellular network operator		→ 🗎 93
			) <b>(</b> ) 04
	Data roaming		→

## 

SIM card ICCID

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

IMEI cellular radio m	odule	
Navigation	□ System → Connectivity → Radio network → Information → RadioModule IMEI	
Description	Displays IMEI of the cellular radio module.	
User interface	Character string comprising numbers, letters and special characters (#32)	
Received signal stren	gth	

Navigation		System $\rightarrow$ Connectivity $\rightarrow$ Radio network $\rightarrow$ Information $\rightarrow$ Rec.sig.strength
Description	Displa	ys the received signal strength.
User interface	0 to 2	55 %

Network type		
Navigation	□ System → Connectivity → Radio network → Information → Network type	
Description	Displays the network type used for the cellular radio connection.	
User interface	<ul> <li>GSM</li> <li>LTEM1</li> <li>LTE-NB-IoT</li> <li>None</li> </ul>	

Cellular network operator		
Navigation		System $\rightarrow$ Connectivity $\rightarrow$ Radio network $\rightarrow$ Information $\rightarrow$ Network operator
Description	Displa	ys the cellular network operator currently used.
User interface	Chara	cter string comprising numbers, letters and special characters (#32)

Data roaming		
Navigation	□ System → Connectivity → Radio network → Information → Data roaming	
Description	Indicates whether the device is in data roaming mode. Additional charges may apply in data roaming mode.	
User interface	<ul><li>Not active</li><li>Active</li></ul>	

### 6.3.3 "Cloud" submenu

Navigation

► Cloud	
► MQTT configuration	→ 🗎 94
► MQTT information	→ 🗎 95
► Data transfer options	→ 🗎 97
► Config. certificate signing request	→ 🗎 99

System  $\rightarrow$  Connectivity  $\rightarrow$  Cloud

#### "MQTT configuration" submenu

*Navigation*  $\square$  System  $\rightarrow$  Connectivity  $\rightarrow$  Cloud  $\rightarrow$  MQTT config.



MQTT broker port			
Navigation		System $\rightarrow$ Connectivity $\rightarrow$ Cloud $\rightarrow$ MQTT config. $\rightarrow$ MQTT broker port	
Description	Ente	r port of the MQTT broker.	

#### User entry

0 to 65 535

MQTT broker URL			Â
Navigation		System $\rightarrow$ Connectivity $\rightarrow$ Cloud $\rightarrow$ MQTT config. $\rightarrow$ MQTT broker URL	
Description	Ente	r URL of the MQTT broker.	
User entry	Chai	acter string comprising numbers, letters and special characters (#100)	

MQTT user name		Â
Navigation	□ System → Connectivity → Cloud → MQTT config. → MQTT user name	
Description	Enter user name for connection to the MQTT broker.	
User entry	Character string comprising numbers, letters and special characters (#32)	

MQTT password			
Navigation		System $\rightarrow$ Connectivity $\rightarrow$ Cloud $\rightarrow$ MQTT config. $\rightarrow$ MQTT password	
Description	Enter	password to connect to the MQTT broker.	
User entry	Chara	acter string comprising numbers, letters and special characters (#32)	

#### "MQTT information" submenu

Navigation	$ \qquad \qquad$	ud $\rightarrow$ MQTT information
► MQTT inform	nation	
	MQTT broker status	→ 🗎 96
	MQTT TLS certificate valid	→ 🗎 96
	MQTT root certificate expires on	→ 🗎 96
	MQTT client certificate expires on	→ 🗎 96

MQTT broker status		
Navigation	System $\rightarrow$ Connectivity $\rightarrow$ Cloud $\rightarrow$ MOTT information $\rightarrow$ Broker status	
Description	Displays the current connection status of the MQTT broker.	
User interface	<ul> <li>Connection OK</li> <li>Connecting</li> <li>No connection</li> <li>Not used</li> </ul>	

#### MQTT TLS certificate valid

Navigation		System $\rightarrow$ Connectivity $\rightarrow$ Cloud $\rightarrow$ MQTT information $\rightarrow$ TLS Certif.valid
Description	Indicat broker	es whether a valid TLS certificate is available to establish a connection to the MQTT .
User interface	■ No ■ Yes	

#### MQTT root certificate expires on

Navigation		System $\rightarrow$ Connectivity $\rightarrow$ Cloud $\rightarrow$ MQTT information $\rightarrow$ RootCert.expir.
Description	Displa	ys the MQTT broker root certificate expiration date.
User interface	Positiv	<i>r</i> e integer

#### MQTT client certificate expires on

Navigation		System $\rightarrow$ Connectivity $\rightarrow$ Cloud $\rightarrow$ MQTT information $\rightarrow$ ClientCertExpir.
Description	Displa	ys the measuring device certificate expiration date.
User interface	Positiv	re integer

#### "Data transfer options" submenu

Navigation

System  $\rightarrow$  Connectivity  $\rightarrow$  Cloud  $\rightarrow$  Data transfer

► Data transfer options		
Data transfer	→ 🗎 97	
Connection interval battery mode	→ 曽 97	
Days of the week	→ 🗎 98	
Reference time connection interval	→ 🗎 98	
Connection interval battery mode	→ 🗎 98	
Days of the week	→ 🗎 99	
Reference time connection interval	→ 🗎 99	

Data transfer	
Navigation	□ System → Connectivity → Cloud → Data transfer → Data transfer
Description	Enabling/disabling data transfer to the cloud
	- When connected to an external power source, the measuring device can send data to the cloud anytime.
	specified in the connection schedule(s) for battery mode.
Selection	<ul><li>Disable</li><li>Enable</li></ul>

Connection interval battery mode		Ê
Navigation	$\blacksquare$ System $\rightarrow$ Connectivity $\rightarrow$ Cloud $\rightarrow$ Data transfer $\rightarrow$ Connect. Interv.	
Description	Select the interval at which the measuring device connects to the MQTT broker in batt mode.	ery
Selection	<ul> <li>15 minutes</li> <li>30 minutes</li> <li>1 hour</li> <li>2 hours</li> <li>4 hours</li> </ul>	

- 6 hours
- 12 hours
- 24 hours

Days of the week		A
Navigation	□ System → Connectivity → Cloud → Data transfer → Days of the week	
Description	Select one or more days when the measuring device connects to the MQTT broker in battery mode.	
Selection	<ul> <li>Sunday</li> <li>Monday</li> <li>Tuesday</li> <li>Wednesday</li> <li>Thursday</li> <li>Friday</li> <li>Saturday</li> </ul>	

Reference time conn	ection interval	â
Navigation	$ \qquad \qquad$	
Description	Enter the reference time to which the interval at which to connect to the MQTT bro battery mode refers. A connection is established at this time.	)ker in
	Additional information: The measured value log entry times (3) derive from the reference time specified (1 the connection interval (2).	) and
User entry	Positive integer	

Navigation	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$
Description	Select the interval at which the measuring device connects to the MQTT broker in battery mode.
Selection	<ul> <li>15 minutes</li> <li>30 minutes</li> <li>1 hour</li> <li>2 hours</li> <li>4 hours</li> <li>6 hours</li> <li>12 hours</li> <li>24 hours</li> </ul>

ß

Connection interval battery mode

Days of the week		ß
Navigation	□ System → Connectivity → Cloud → Data transfer → Days of the week	
Description	Select one or more days when the measuring device connects to the MQTT broker in battery mode.	
Selection	<ul> <li>Sunday</li> <li>Monday</li> <li>Tuesday</li> <li>Wednesday</li> <li>Thursday</li> <li>Friday</li> <li>Saturday</li> </ul>	

Reference time connection interval		A
Navigation	□ System → Connectivity → Cloud → Data transfer → IntervalRefTime	
Description	Enter the reference time to which the interval at which to connect to the MQTT broke battery mode refers. A connection is established at this time.	er in
	Additional information: The measured value log entry times (3) derive from the reference time specified (1) a the connection interval (2).	nd
User entry	Positive integer	

#### "Config. certificate signing request" submenu

Navigation $\Box$ System  $\rightarrow$  Connectivity  $\rightarrow$  Cloud  $\rightarrow$  CSR config.

► Config. certificate signing request	
Country code	→ 🗎 100
State or province	→ 🗎 104
Locality	→ 🗎 104
Organization	→ 🗎 104
Organization unit	→ 🗎 105

A

Country code	
Navigation	$\square$ System $\rightarrow$ Connectivity $\rightarrow$ Cloud $\rightarrow$ CSR config. $\rightarrow$ Country code
navigation	System / connectivity / cloud / concerning. / country code
Description	Select the two-digit country code of the country in which the organization operates.
Selection	■
	AD : Andorra
	<ul> <li>AE : United Arab Emirates</li> </ul>
	AF : Afghanistan
	<ul> <li>AG : Antigua and Barbuda</li> </ul>
	• AI : Anguilla
	AL : Albania
	AM : Armenia
	AU: Angola
	AQ : Antarctica
	AR : Argentina
	AS : American Samoa
	• AII : Australia
	• AU . Australia $- \Delta M + \Delta m h h h$
	<ul> <li>AVV. Aluba</li> <li>AV: Åland Islands</li> </ul>
	• $AX \cdot Atalia Istalias$
	<ul> <li>AZ: AZCIDAIJAN</li> <li>BA: Bosnia and Herzegowina</li> </ul>
	BB : Barbados
	BD : Bangladesh
	■ BF : Belgium
	<ul> <li>BF : Burkina Faso</li> </ul>
	• BG : Bulgaria
	BH : Bahrain
	BI : Burundi
	■ BJ : Benin
	<ul> <li>BL : Saint Barthélemy</li> </ul>
	BM : Bermuda
	BN : Brunei Darussalam
	BO : Bolivia, Plurinational State of
	<ul> <li>BQ : Bonaire, Sint Eustatius and Saba</li> </ul>
	<ul> <li>BR : Brazil</li> </ul>
	BS : Bahamas
	<ul> <li>BT : Bhutan</li> </ul>
	<ul> <li>BV : Bouvet Island</li> </ul>
	<ul> <li>BW : Botswana</li> </ul>
	BY : Belarus
	BZ : Belize

- CA : Canada
- CC : Cocos (Keeling) Islands
- CD : Congo, the Democratic Republic of the
- CF : Central African Republic
- CG : Congo
- CH : Switzerland
- CI : Côte d'Ivoire
- CK : Cook Islands
- CL : Chile
- CM : Cameroon
- CN : China
- CO : Colombia
- CR : Costa Rica
- CU : Cuba

- CV : Cabo Verde
- CW : Curaçao
- CX : Christmas Island
- CY : Cyprus
- CZ : Czechia
- DE : Germany
- DJ : Djibouti
- DK : Denmark
- DM : Dominica
- DO : Dominican Republic
- DZ : Algeria
- EC : Ecuador
- EE : Estonia
- EG : Egypt
- EH : Western Sahara
- ER : Eritrea
- ES : Spain
- ET : Ethiopia
- FI : Finland
- FJ : Fiji
- FK : Falkland Islands
- FM : Micronesia
- FO : Faroe Islands
- FR : France
- GR : Greece
- GB : United Kingdom of Great Britain and Northern Ireland
- GA : Gabon
- GP : Guadeloupe
- GE : Georgia
- GF : French Guiana
- GN : Guinea
- GM : Gambia
- GD : Grenada
- GG : Guernsey
- GH : Ghana
- GI : GI
- GL : Greenland
- GQ : Equatorial Guinea
- GS : South Georgia and the South Sandwich Islands
- GT : Guatemala
- GU : Guam
- GW : Guinea-Bissau
- GY : Guyana
- HK : Hong Kong
- HM : Heard Island and McDonald Islands
- HN : Honduras
- HR : Croatia
- HT : Haiti
- HU : Hungary
- IL : Israel
- IE : Ireland
- ID : Indonesia
- IM : Isle of Man
- IN : India
- IO : British Indian Ocean Territory
- IQ : Iraq
- IR : Iran
- IS : Iceland
- IT : Italy

- JE : Jersey
- JM : Jamaica
- JO : Jordan
- JP : Japan
- KH : Cambodia
- KG : Kyrgyzstan
- KE : Kenya
- KI : Kiribati
- KM : Comoros
- KN : Saint Kitts and Nevis
- KP : Korea
- KR : Korea
- KW : Kuwait
- KY : Cayman Islands
- KZ : Kazakhstan
- LU : Luxembourg
- LI : Liechtenstein
- LC : Saint Lucia
- LB : Lebanon
- LA : Lao People's Democratic Republic
- LK : Sri Lanka
- LR : Liberia
- LS : Lesotho
- LT : Lithuania
- LV : Latvia
- LY : Libya
- MH : Marshall Islands
- ME : Montenegro
- MD : Moldova
- MC : Monaco
- MA : Morocco
- MF : Saint Martin
- MG : Madagascar
- MK : North Macedonia
- ML : Mali
- MM : Myanmar
- MN : Mongolia
- MO : Macao
- MP : Northern Mariana Islands
- MQ : Martinique
- MR : Mauritania
- MS : Montserrat
- MT : Malta
- MU : Mauritius
- MV : Maldives
- MW : Malawi
- MX : Mexico
- MY : Malaysia
- MZ : Mozambique
- NE : Niger
- NF : Norfolk Island
- NG : Nigeria
- NC : New Caledonia
- NA : Namibia
- NI : Nicaragua
- NL : Netherlands
- NO : Norway
- NP : Nepal
- NR : Nauru

- NU : Niue
- NZ : New Zealand
- OM : Oman
- PA : Panama
- PE : Peru
- PF : French Polynesia
- PG : Papua New Guinea
- PH : Philippines
- PK : Pakistan
- PL : Poland
- PM : Saint Pierre and Miquelon
- PN : Pitcairn
- PR : Puerto Rico
- PS : Palestine
- PT : Portugal
- PW : Palau
- PY : Paraguay
- QA : Qatar
- RE : Réunion
- RO : Romania
- RS : Serbia
- RU : Russian Federation
- RW : Rwanda
- SA : Saudi Arabia
- SB : Solomon Islands
- SC : Seychelles
- SD : Sudan
- SE : Sweden
- SG : Singapore
- SH : Saint Helena, Ascension and Tristan da Cunha
- SI : Slovenia
- SJ : Svalbard and Jan Mayen
- SK : Slovakia
- SL : Sierra Leone
- SM : San Marino
- SN : Senegal
- SO : Somalia
- SR : Suriname
- SS : South Sudan
- ST : Sao Tome and Principe
- SV : El Salvador
- SX : Sint Maarten
- SY : Syrian Arab Republic
- SZ : Eswatini
- TC : Turks and Caicos Islands
- TD : Chad
- TJ : Tajikistan
- TK : Tokelau
- TL : Timor-Leste
- TM : Turkmenistan
- TN : Tunisia
- TR : Turkey
- TT : Trinidad and Tobago
- TF : French Southern Territories
- TG : Togo
- TH : Thailand
- TO : Tonga
- TV : Tuvalu
- TW : Taiwan

- TZ : Tanzania
- UA : Ukraine
- UG : Uganda
- UM : United States Minor Outlying Islands
- US : United States of America
- UY : Uruguay
- UZ : Uzbekistan
- VA : Holy See
- VC : Saint Vincent and the Grenadines
- VE : Venezuela
- VG : Virgin Islands
- VI : Virgin Islands
- VN : Viet Nam
- VU : Vanuatu
- WF : Wallis and Futuna
- WS : Samoa
- YE : Yemen
- YT : Mayotte
- ZA : South Africa
- ZM : Zambia
- ZW : Zimbabwe

State or province		
Navigation	□ System → Connectivity → Cloud → CSR config. → State/province	
Description	Enter the state or region where the organization operates.	
User entry	Character string comprising numbers, letters and special characters (#32)	
Locality		
Navigation	□ System → Connectivity → Cloud → CSR config. → Locality	
Description	Enter the city or town where the organization is located.	
User entry	Character string comprising numbers, letters and special characters (#32)	
Organization		Â
Navigation	$ \qquad \qquad$	

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

Enter the organization to which the certificate applies.

Description

Organization unit			A
Navigation		System $\rightarrow$ Connectivity $\rightarrow$ Cloud $\rightarrow$ CSR config. $\rightarrow$ Org. unit	
Description	Enter	the organizational unit to which the certificate applies.	
User entry	Chara	cter string comprising numbers, letters and special characters (#32)	

# 6.4 "Date/time" submenu

Navigation

System → Date/time

► Date/time			
	Set date/time		→ 🗎 105
	Time format	]	→ 🖺 105
	Time zone	]	→ 🗎 106

Set date/time		ß
Navigation	□ System $\rightarrow$ Date/time $\rightarrow$ 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	Positive integer	
Time format		
Navigation		
Description	Select time format.	
Selection	■ 24 h ■ 12 h AM/PM	

Time zone		æ
Navigation	□ System $\rightarrow$ Date/time $\rightarrow$ Time zone	
Description	Select the time zone. Every time the time zone is changed, a logbook entry is created.	
Selection	$\begin{array}{l} Other units \\ & UTC-12:00 \\ & UTC-11:00 \\ & UTC-0:00 \\ & UTC-09:30 \\ & UTC-09:00 \\ & UTC-08:00 \\ & UTC-06:00 \\ & UTC-06:00 \\ & UTC-05:00 \\ & UTC-04:00 \\ & UTC-03:30 \\ & UTC-03:30 \\ & UTC-03:00 \\ & UTC-01:00 \\ & UTC-01:00 \\ & UTC+01:00 \\ & UTC+03:00 \\ & UTC+03:30 \\ & UTC+03:30 \\ & UTC+03:30 \\ & UTC+04:30 \\ & UTC+05:30 \\ & UTC+05:30 \\ & UTC+05:45 \\ & UTC+06:00 \\ & UTC+07:00 \\ & UTC+07:00 \\ & UTC+07:00 \\ & UTC+07:00 \\ & UTC+08:00 \\ \end{array}$	

- 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

# 6.5 "Geolocation" submenu

Navigation	$ \qquad \qquad$	
► Geolocation		
	Location description	→ ➡ 107
	Longitude	→ <sup>●</sup> 107
	Latitude	→ <sup>●</sup> 107
	Altitude	→ ➡ 108
	Location method	→ 🗎 108

Location description		
Navigation	$ \qquad \qquad$	
Description	Enter a description for the location	
User entry	Character string comprising numbers, letters and special characters (#32)	
Longitude		
Navigation	$ \qquad \qquad$	
Description	Enter the longitude.	
User entry	-180 to 180°	
Latitude		ß
Navigation		
Description	Enter latitude	
User entry	-90 to 90°	

Altitude		
Navigation	$ \qquad \qquad$	
Description	Enter altitude	
User entry	Signed floating-point number	
Location method		٦
Navigation	$ \qquad \qquad$	
Description	Select the location method.	
Selection	<ul> <li>No fix</li> <li>GPS or Standard Positioning Service fix</li> <li>Differential GPS fix</li> <li>Precise positioning service (PPS) fix</li> <li>Real Time Kinetic (RTK) fixed solution</li> <li>Real Time Kinetic (RTK) float solution</li> <li>Estimated dead reckoning</li> </ul>	

- Manual input mode
- Simulation Mode

# 6.6 "Power management" submenu

Navigation

 $\Box$  System  $\rightarrow$  Power management

► Power management			
Estimated battery lifetime	) → 🗎 109		
Battery charge state	) → 🗎 109		
Confirm battery replacement	) → 🖺 109		
Low battery diagnostic message	) → 🗎 109		
Capacity battery 1	) → 🗎 110		
Capacity battery 2	) → 🗎 110		
Estimated battery li	fetime		
----------------------	--		
Navigation	$ \qquad \qquad$		
Description	Displays the approx. remaining life of the batteries. If the remaining life is less than 180 days, the measuring device generates a diagnostic message for diagnostic event "960 Low battery diagnostic message".		
	Additional information: The remaining battery life until a diagnostic message is triggered can be modified for diagnostic event "890 Battery low" in the "Battery lifetime is less than 180 days" parameter.		
User interface	Positive floating-point number		

Battery charge state				
Navigation		System $\rightarrow$ Power management $\rightarrow$ BattChargeState		
Description	Shov	Shows the charge state of the batteries.		
User interface	0 to 100 %			

Confirm battery replacement		
Navigation	System $\rightarrow$ Power management $\rightarrow$ Conf. replacem.	
Description	Confirm battery replacement by selecting the appropriate battery.	
Selection	<ul> <li>Cancel</li> <li>Battery 1</li> <li>Battery 2 *</li> </ul>	

Low battery diagnostic message		
Navigation	□ System $\rightarrow$ Power management $\rightarrow$ LowBatteryDiagn	
Description	Set remaining battery life for diagnostic event "890Battery low". When this lifespan is reached, the respective diagnostic message is generated.	
User entry	Positive floating-point number	

<sup>\*</sup> Visibility depends on order options or device settings

Capacity battery 1					
Navigation		System $\rightarrow$ Power management $\rightarrow$ Capacity batt. 1			
Description	Enter capacity for new battery with 100 % charge state.				
User entry Positive floating-point number					
Capacity battery 2			Â		

Navigation		System $\rightarrow$ Power management $\rightarrow$ Capacity batt.2
Description	Enter	capacity for new battery with 100 % charge state.
User entry	Positiv	ve floating-point number

### 6.7 "Information" submenu

*Navigation*  $\square \square$  System  $\rightarrow$  Information

► Information	
► Device	→ 🗎 110
► Cellular radio module	→ 🗎 113
► Electronic module	→ 🗎 114
► Display module	→ 🗎 115

### 6.7.1 "Device" submenu

*Navigation*  $\square$  System  $\rightarrow$  Information  $\rightarrow$  Device

► Device	
Serial number	) → 🗎 111
Order code	) → 🗎 111
Firmware version	) → 🗎 111
Extended order code 1	) → 🗎 112

Extended order code 2	→ 🗎 112
Extended order code 3	→ 🗎 112
Device name	→ 🗎 113
ENP version	→ 🗎 113
Manufacturer	→ 🗎 113

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	$ \qquad \qquad$				
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.				
<b>User interface</b> Character string comprising numbers, letters and special characters (#8)					

Extended order code 1	l	ð
Navigation	□ System $\rightarrow$ Information $\rightarrow$ Device $\rightarrow$ Ext. order cd. 1	
Description	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 optio thereby uniquely identifying the device model.	n,
	Additional information: The extended order code can also be found on the nameplate.	
User interface	Character string comprising numbers, letters and special characters (#20)	

Extended order code 2	Ē	8
Navigation	□ System $\rightarrow$ Information $\rightarrow$ Device $\rightarrow$ Ext. order cd. 2	
Description	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.	n,
	Additional information: The extended order code can also be found on the nameplate.	
User interface	Character string comprising numbers, letters and special characters (#20)	

# Extended order code 3 Image: System → Information → Device → Ext. order cd. 3 Navigation Image: System → Information → Device → Ext. order cd. 3 Description 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. Additional information: The extended order code can also be found on the nameplate. User interface Character string comprising numbers, letters and special characters (#20)

Device name	
Navigation	System $\rightarrow$ Information $\rightarrow$ Device $\rightarrow$ 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)
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 $\rightarrow$ Information $\rightarrow$ Device $\rightarrow$ Manufacturer
Description	Displa	ays the manufacturer.
User interface	Chara	cter string comprising numbers, letters and special characters (#32)

### 6.7.2 "Cellular radio module" submenu

Navigation		System $\rightarrow$ Information $\rightarrow$ Radio mod	lule
► Cellular radio	module		
	Firmwa	re version	→ 🗎 113



User interface	Positive integer		
Build no. software			
Navigation	□ System $\rightarrow$ Information $\rightarrow$ Radio module $\rightarrow$ Build no. softw.		
Description	Displays the build number of the module firmware.		
User interface	0 to 65 535		
Bootloader revision			
Navigation	□ System $\rightarrow$ Information $\rightarrow$ Radio module $\rightarrow$ Bootloader rev.		
Description	Displays the bootloader revision of the module firmware.		
User interface	Positive integer		

### 6.7.3 "Electronic module" submenu

Naviaation	System $\rightarrow$ Information $\rightarrow$ Electr. module
rurigation	bybeen i mormation i Dieeen mouale

► Electronic module		
Firmware version	 ]	→ 🗎 114

Firmware version	
Navigation	□ System → Information → Electr. module → Firmware version
Description	Displays the firmware version of the module.
User interface	Positive integer

**Bootloader revision** 

## Build no. software Navigation □ System → Information → Electr. module → Build no. softw. Description Displays the build number of the module firmware. User interface 0 to 65 535

### Navigation□System → Information → Electr. module → Bootloader rev.DescriptionDisplays the bootloader revision of the module firmware.User interfacePositive integer

### 6.7.4 "Display module" submenu

Navigation

System  $\rightarrow$  Information  $\rightarrow$  Display module

► Display module	
Software revision	→ 🗎 115
Build no. software	) → 🗎 116
Bootloader revision	] → 🗎 116

### 

**Description** Displays the firmware version of the module.

User interface Positive integer

Build no. software		
Navigation	□ System $\rightarrow$ Information $\rightarrow$ Display module $\rightarrow$ Build no. softw.	
Description	Displays the build number of the module firmware.	
User interface	0 to 65 535	
Bootloader revision		
Navigation	□ System → Information → Display module → Bootloader rev.	

**Description** Displays the bootloader revision of the module firmware.

User interface Positive integer

### 6.8 "Display" submenu

Navigation

System → Display

► Display	
Value 1 display	→ 🗎 117
Value 2 display	→ 🗎 117
Value 3 display	→ 🗎 117
Value 4 display	→ 🗎 118
Display damping	→ 🗎 118
Brightness	→ 🗎 118
Color scheme	→ 🗎 118
Backlight	→ 🗎 119
Contrast display	→ 🗎 119
Rotation display	→ 🗎 119

Value 1 display		£
Navigation	□ System $\rightarrow$ Display $\rightarrow$ 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> <li>Volume flow</li> <li>Conductivity*</li> <li>Pressure*</li> <li>Totalizer 1</li> <li>Totalizer 2</li> <li>Totalizer 3</li> </ul>	

Value 2 display		Â
Navigation	□ System $\rightarrow$ Display $\rightarrow$ 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	<ul> <li>None</li> </ul>	
	<ul> <li>Volume flow</li> </ul>	
	Conductivity*	
	Pressure *	
	<ul> <li>Totalizer 1</li> </ul>	
	Totalizer 2	
	<ul> <li>Totalizer 3</li> </ul>	

Value 3 display		
Navigation	System $\rightarrow$ Display $\rightarrow$ 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	<ul> <li>None</li> <li>Volume flow</li> <li>Conductivity*</li> <li>Pressure*</li> <li>Totalizer 1</li> <li>Totalizer 2</li> <li>Totalizer 3</li> </ul>	

<sup>\*</sup> Visibility depends on order options or device settings

Value 4 display		Ê
Navigation	$ \qquad \qquad$	
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	<ul> <li>None</li> <li>Volume flow</li> <li>Conductivity*</li> <li>Pressure*</li> <li>Totalizer 1</li> <li>Totalizer 2</li> <li>Totalizer 3</li> </ul>	

Display damping	ه
Navigation	System $\rightarrow$ Display $\rightarrow$ 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.
User entry	0.0 to 999.9 s

Brightness	
Navigation	$\Box \qquad System \rightarrow Display \rightarrow Brightness$
Description	Adjust brightness.
User entry	0 to 100 %

### Color scheme

Navigation	System $\rightarrow$ Display $\rightarrow$ Color scheme
<b>J</b>	

Description

Select preferred color scheme.

A

<sup>\*</sup> Visibility depends on order options or device settings

### Selection

LightDark

Backlight		
Navigation	$\square$ System $\rightarrow$ Display $\rightarrow$ Backlight	
Ivavigation	System > Display > Dacklight	
Description	Switch the local display backlight on / off.	
Selection	<ul><li>Disable</li><li>Enable</li></ul>	
Contrast display		
Navigation	$ \qquad \qquad$	
Description	Adjust local display contrast setting to ambient conditions (e.g. lighting or reading angle).	
User entry	20 to 80 %	
Rotation display	ß	
Navigation	System $\rightarrow$ Display $\rightarrow$ Rotation display	
Description	Select rotation angle of the display text to optimize local display readability.	
Selection	<ul> <li>Auto</li> <li>O degree</li> <li>90 degree</li> <li>180 degree</li> <li>270 degree</li> </ul>	

### 6.9 "Software configuration" submenu

Navigation

System  $\rightarrow$  Software config.

► Software configuration	
Activate SW option	→ 🗎 120
Software option overview	→ 🗎 120

Activate SW option		
Navigation	□ System $\rightarrow$ Software config. $\rightarrow$ Activate SW opt.	
Description	Enter application package code or code of the functionality ordered separately to acti it.	vate
	Additional information: - If a measuring device was ordered with an add-on software option, the activation co programmed into the measuring device ex factory. - After entering the activation code: Check whether the new software option is displa in the "Software option overview" parameter and therefore active.	ode is iyed
	NOTE If an an invalid code is entered the software options that have already been activated invalidated! Before entering a new activation code: Create a record of the existing activation code	are
User entry	Positive integer	

### Software option overview

Navigation	System $\rightarrow$ Software config. $\rightarrow$ 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	<ul> <li>Extended data logger</li> <li>Heartbeat Verification</li> <li>Custody transfer</li> <li>Heartbeat Monitoring</li> </ul>

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