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71510275
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Valid as of version
01.00.zz (Device firmware)

Description of Device Parameters
Proline Promag 800

Electromagnetic flowmeter
Modbus RS485

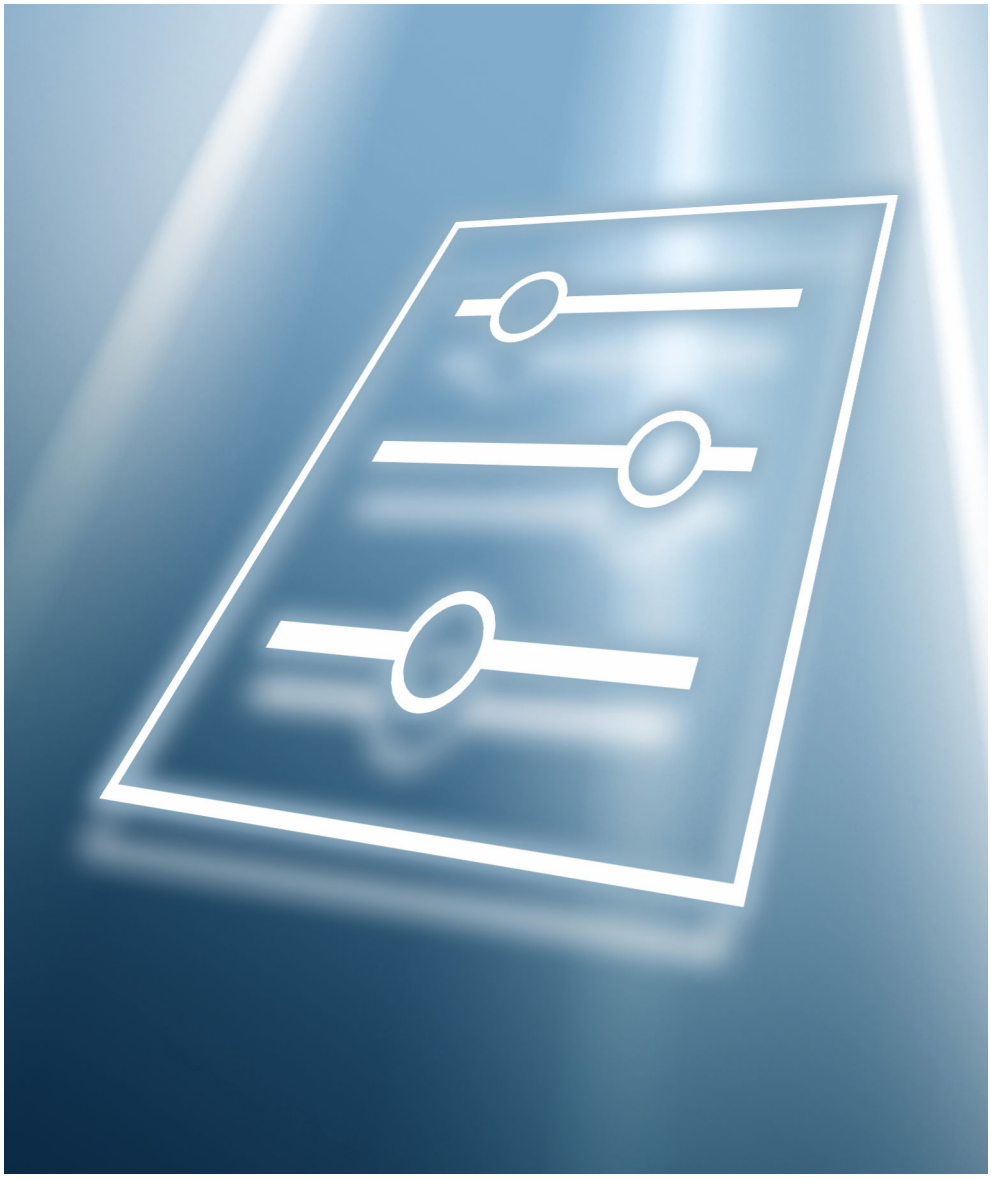

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Table of contents

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
	**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 (→ 6), which guides the user automatically through all the device parameters that are required for commissioning
- **Application** menu (→ 40)
- **Diagnostics** menu (→ 21)
- **System** menu (→ 78)

1.3.3 Structure of a parameter description

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

Complete parameter name	Write-protected parameter =

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

Prerequisite
The parameter is only available under these specific conditions

Description
Description of the parameter function

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

User entry
Input range for the parameter

User interface
Display value/data for the parameter

Factory setting
Default setting ex works

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

1.4 Documentation

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

1.4.1 Operating Instructions

Measuring device	Documentation code
Proline 800	BA02043D

1.4.2 Special Documentation

Contents	Documentation code
Heartbeat Technology	SD01746D
Display with Bluetooth interface	SD02655D
Using Open Source Software Licenses	SD02658D
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
	▶ **Import / Export**	→ 19

2.1 "Commissioning" wizard

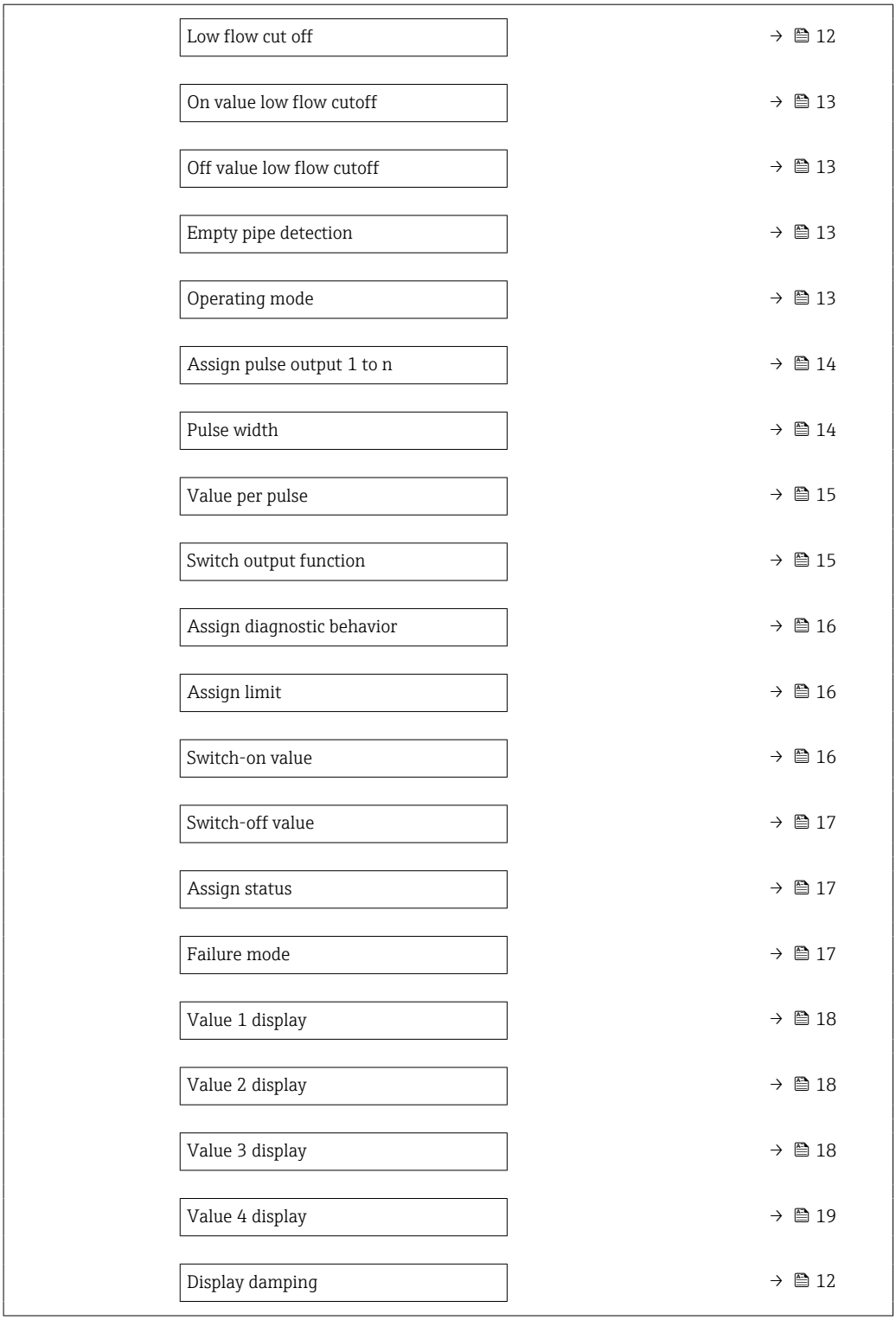
Complete this wizard to commission the device.

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.

Navigation Guidance → Commissioning

▶ **Commissioning**		
	Device tag	→ 7
	Serial number	→ 8
	Firmware version	→ 8
	Device name	→ 8
	Volume flow unit	→ 8
	Volume unit	→ 9
	Temperature unit	→ 10
	Pressure unit	→ 10
	Assign process variable	→ 10
	Unit totalizer 1 to n	→ 11
	Totalizer operation mode	→ 11
	Failure mode	→ 12



Device tag

Navigation Guidance → Commissioning → Device tag

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

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

Serial number

Navigation Guidance → Commissioning → Serial number

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

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

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

Firmware version

Navigation Guidance → Commissioning → Firmware version

Description Displays the device firmware version installed.

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

Device name

Navigation Guidance → Commissioning → Device name

Description Displays the name of the transmitter.

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

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

Volume flow unit

Navigation Guidance → Commissioning → Volume flow unit

Description Select volume flow unit.

Selection

SI units
- cm^3/s
- cm^3/min
- cm^3/h
- cm^3/d
- dm^3/s
- dm^3/min
- dm^3/h
- dm^3/d
- m^3/s
- m^3/min
- m^3/h
- m^3/d
- ml/s
- ml/min
- ml/h
- ml/d
- l/s
- l/min
- l/h
- l/d
- 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^3/min
- ft^3/h
- ft^3/d
- $MMft^3/s$
- $MMft^3/min$
- $MMft^3/h$
- Mft^3/d
- fl oz/s (us)
- fl oz/min (us)
- fl oz/h (us)
- fl oz/d (us)
- gal/s (us)
- gal/min (us)
- gal/h (us)
- gal/d (us)
- 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)
- kgal/s (us)
- kgal/min (us)
- kgal/h (us)
- kgal/d (us)

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)

Volume unit

Navigation Guidance → Commissioning → Volume unit

Description Select volume unit.

Selection

SI units
- cm^3
- dm^3
- m^3
- ml
- l
- hl
- Ml Mega

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

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

Temperature unit

Navigation Guidance → Commissioning → Temperature unit

Description Select temperature unit.

Selection

SI units
- °C
- K

US units
- °F
- °R

Pressure unit

Navigation Guidance → Commissioning → Pressure unit

Description Select process pressure unit.

Selection

SI units
- MPa a
- MPa g
- kPa a
- kPa g
- Pa a
- Pa g
- bar
- bar g

US units
- psi a
- psi g

Assign process variable

Navigation Guidance → Commissioning → Assign variable

Description Select process variable for totalizer.

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

Selection
- Off
- Volume flow

Unit totalizer

Navigation Guidance → Commissioning → Unit totalizer 1 to n

Description Select process variable totalizer unit.

Selection

SI units
- cm^3 *
- dm^3 *
- m^3 *
- ml *
- l *
- hl *
- Ml Mega *

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

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

* Visibility depends on order options or device settings

or

Other units
None *

* Visibility depends on order options or device settings

Totalizer operation mode

Navigation Guidance → Commissioning → Operation mode

Description Select totalizer calculation mode.

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

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

Failure mode

Navigation Guidance → Commissioning → Failure mode

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
- 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.

Display damping

Navigation Guidance → Commissioning → 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 Guidance → Commissioning → Low flow cut off

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

Selection
- Off
- Volume flow

On value low flow cutoff

Navigation Guidance → Commissioning → On value

Description Enter on value to switch on low flow cut off.

Value = 0: No low flow cut off
Value > 0: Low flow cut off is activated

User entry Positive floating-point number

Off value low flow cutoff

Navigation Guidance → Commissioning → Off value

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

User entry 0 to 100.0 %

Empty pipe detection

Navigation Guidance → Commissioning → Empty pipe det.

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

Selection
- Off
- On

Operating mode

Navigation Guidance → Commissioning → Operating mode

Description Set the output mode to pulse or switch.

Selection
- Pulse
- Switch

Additional information *Selection*

- **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.
- **Switch** option
  Indicates when the state of the device changes, e.g. when a specified limit value is reached.
  Additional information:
  - The switch output can be in one of two states: either it is conductive or it is non-conductive.
  - When the function assigned to the switch output is triggered, the switch output will depending on the output configuration either be continuously conductive or continuously non-conductive 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.
  - 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.

Assign pulse output

Navigation Guidance → Commissioning → Assign pulse 1 to n

Description Select process variable for pulse output.

Selection
- Off
- Volume flow

Pulse width

Navigation Guidance → Commissioning → 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

Navigation Guidance → Commissioning → 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

Navigation Guidance → Commissioning → 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.

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

Additional information *Selection*

- **Off** option
  The switch output is permanently switched off (open, non-conductive).
- **On** option
  The switch output is permanently switched on (closed, conductive).
- **Diagnostic behavior** option
  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 behavior

Navigation Guidance → Commissioning → Assign diag. beh

Description Select the diagnostic behavior for which the switch output should emit a pulse.

Selection
- Alarm
- Alarm or warning
- Warning

Additional information *Selection*
- **Alarm** option
  The switch output only emits a pulse for diagnostic events of the "Alarm" category.
- **Alarm or warning** option
  The switch output emits a pulse for diagnostic events of the "Alarm" or "Warning" category.
- **Warning** option
  The switch output only emits a pulse for diagnostic events of the "Warning" category.

Assign limit

Navigation Guidance → Commissioning → 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
- Off
- Volume flow
- Flow velocity
- Conductivity *
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Pressure *
- Battery state of charge

Switch-on value

Navigation Guidance → Commissioning → 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

* Visibility depends on order options or device settings

Switch-off value

Navigation Guidance → Commissioning → Switch-off value

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

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

User entry Signed floating-point number

Assign status

Navigation Guidance → Commissioning → 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 is conductive. Otherwise, the switch output is non-conductive.

Selection
- Empty pipe detection
- Low flow cut off

Failure mode

Navigation Guidance → Commissioning → 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
- Actual status
- Open
- Closed

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

Value 1 display

Navigation Guidance → Commissioning → Value 1 display

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

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

Selection
- Volume flow
- Conductivity *
- Pressure *
- Totalizer 1
- Totalizer 2
- Totalizer 3

Value 2 display

Navigation Guidance → Commissioning → Value 2 display

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

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

Selection
- None
- Volume flow
- Conductivity *
- Pressure *
- Totalizer 1
- Totalizer 2
- Totalizer 3

Value 3 display

Navigation Guidance → Commissioning → Value 3 display

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

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

Selection
- None
- Volume flow
- Conductivity *
- Pressure *
- Totalizer 1
- Totalizer 2
- Totalizer 3

* Visibility depends on order options or device settings

Value 4 display

Navigation Guidance → Commissioning → Value 4 display

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

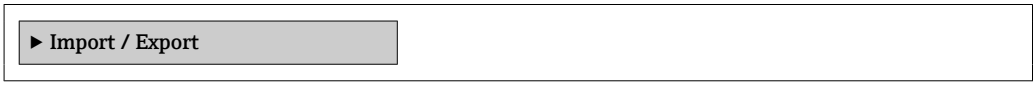
Additional information:
The applicable unit of measure is specified in the "System units" submenu.

Selection
- None
- Volume flow
- Conductivity *
- Pressure *
- Totalizer 1
- Totalizer 2
- Totalizer 3

2.2 "Import / Export" submenu

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

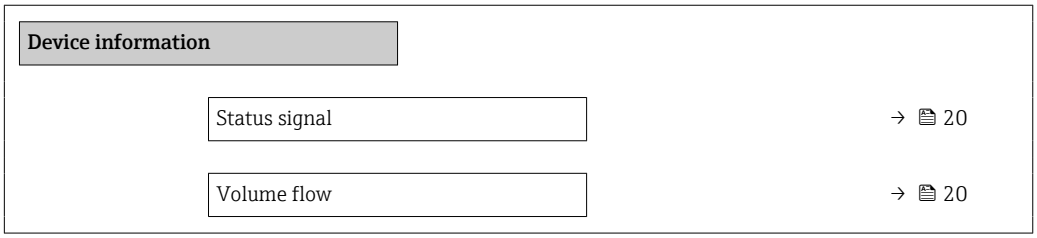
Navigation Guidance → Import / Export



* Visibility depends on order options or device settings

3 "Device information" menu

Navigation Device info



Status signal

Navigation Device info → Status signal

User interface
- OK
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- ---
- Not categorized

Volume flow

Navigation Application → Measured values → Volume flow

Description Displays the volume flow currently measured.

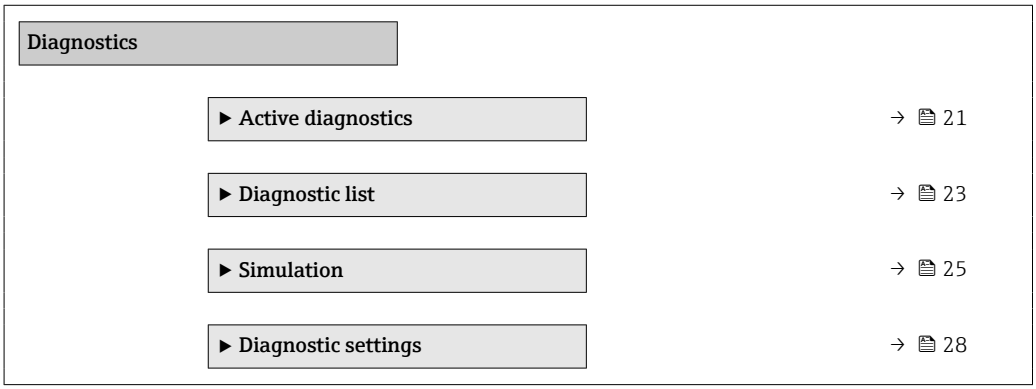
Additional information:
The applicable unit of measure is specified in the "System units" submenu.

User interface Signed floating-point number

4 "Diagnostics" menu

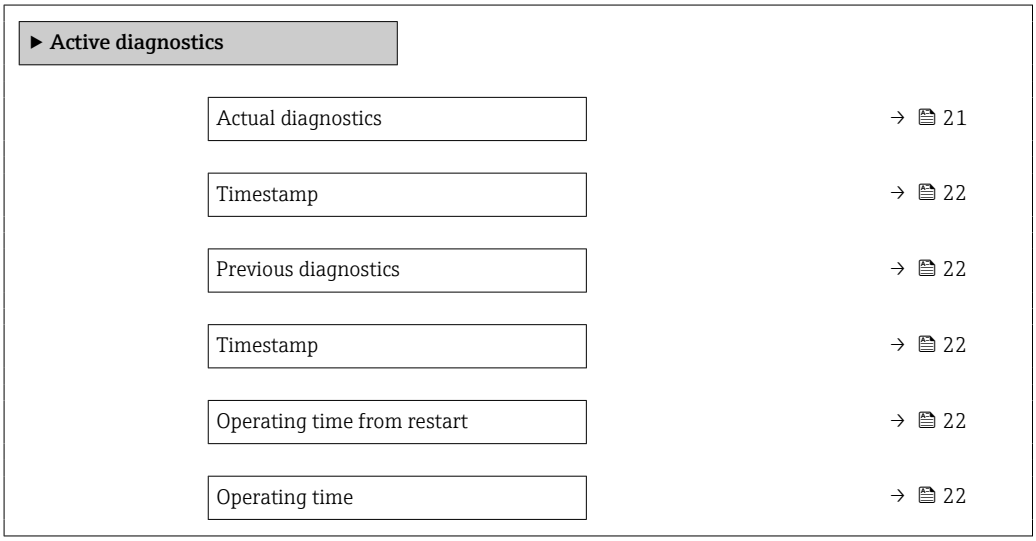
Troubleshooting and preventive maintenance – settings for device behavior during process and device events as well as assistance and measures for diagnostic purposes.

Navigation Diagnostics



4.1 "Active diagnostics" submenu

Navigation Diagnostics → Active diagnos.



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 → Active diagnos. → Timestamp

Description Displays the timestamp for the currently active diagnostic message.

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

Previous diagnostics

Navigation Diagnostics → Active diagnos. → Prev.diagnostics

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

User interface Positive integer

Timestamp

Navigation Diagnostics → Active diagnos. → Timestamp

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

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

Operating time from restart

Navigation Diagnostics → Active diagnos. → Time fr. restart

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

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

Operating time

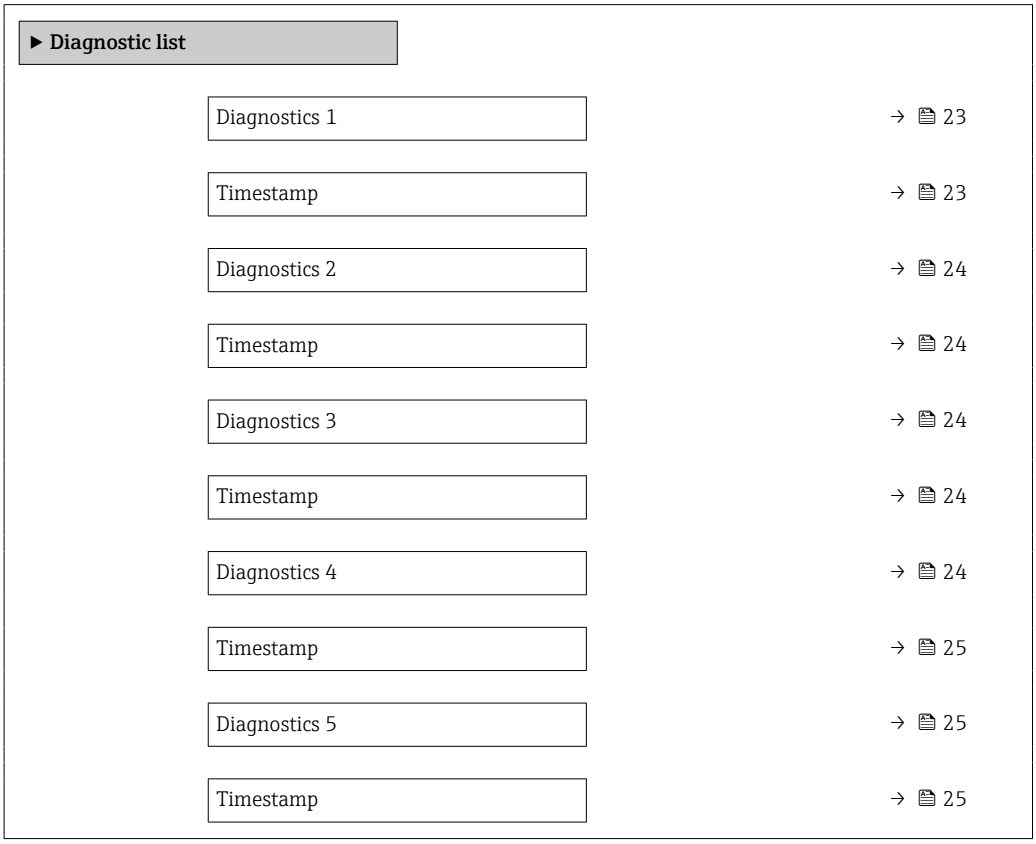
Navigation Diagnostics → Active diagnos. → Operating time

Description Indicates how long the device has been in operation.

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

4.2 "Diagnostic list" submenu

Navigation Diagnostics → Diagnostic list → Diagnostics 1



Diagnostics 1

Navigation Diagnostics → Diagnostic list → Diagnostics 1

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

User interface Positive integer

Timestamp

Navigation Diagnostics → Diagnostic list → Timestamp

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

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

Diagnostics 2

Navigation Diagnostics → Diagnostic list → Diagnostics 2

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

User interface Positive integer

Timestamp

Navigation Diagnostics → Diagnostic list → Timestamp

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

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

Diagnostics 3

Navigation Diagnostics → Diagnostic list → Diagnostics 3

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

User interface Positive integer

Timestamp

Navigation Diagnostics → Diagnostic list → Timestamp

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

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

Diagnostics 4

Navigation Diagnostics → Diagnostic list → Diagnostics 4

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

User interface Positive integer

Timestamp

Navigation Diagnostics → Diagnostic list → Timestamp

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

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

Diagnostics 5

Navigation Diagnostics → Diagnostic list → Diagnostics 5

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

User interface Positive integer

Timestamp

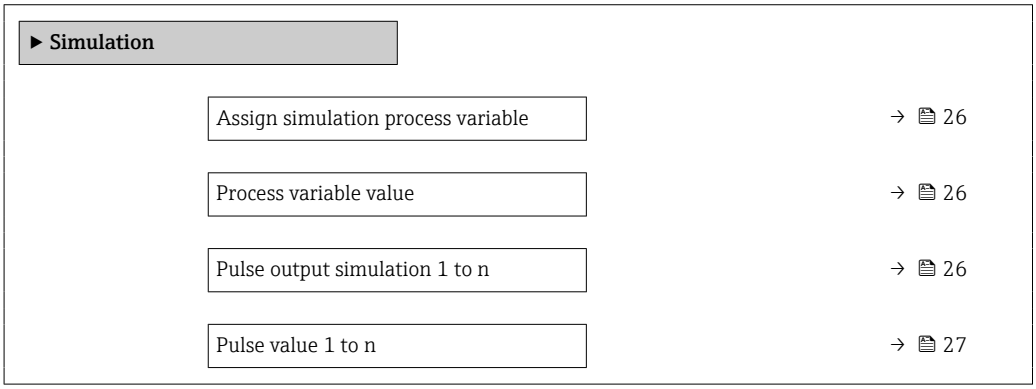
Navigation Diagnostics → Diagnostic list → Timestamp

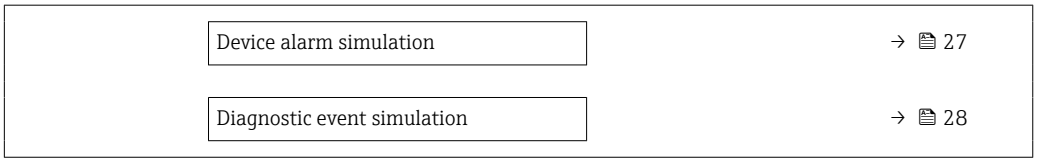
Description Displays the timestamp for the diagnostic message with the fifth highest priority.

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

4.3 "Simulation" submenu

Navigation Diagnostics → Simulation





Assign simulation process variable

Navigation Diagnostics → Simulation → Assign proc.var.

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

Selection
- Off
- Volume flow
- Flow velocity
- Conductivity *
- Temperature *
- Pressure

Process variable value

Navigation Diagnostics → Simulation → Proc. var. value

Description Enter the simulation value for the selected process variable. Processing of measured values downstream as well as the signal 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

Navigation Diagnostics → Simulation → Puls.outp.sim. 1 to n

Description Switch simulation of the pulse output on or off.

Selection
- Off
- Fixed value
- Down-counting value

* Visibility depends on order options or device settings

Additional information *Selection*

- **Off** option
  Simulation of the pulse output is switched off. The device is in standard operation mode or another process variable is being simulated.
- **Fixed value** option
  Pulses are emitted continuously with the pulse width specified in the "Pulse width" parameter.
- **Down-counting value** option
  The number of pulses specified in the "Pulse value " parameter are emitted.

Pulse value 1 to n

Navigation Diagnostics → Simulation → Pulse value 1 to n

Description Enter the number of pulses to simulate the pulse output. In this manner, it is possible to verify the pulse output is configured correctly and downstream processing units are functioning properly.

User entry 0 to 65 535

Diagnostic event category

Navigation Diagnostics → Simulation → Event category

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

Selection

- Sensor
- Electronics
- Configuration
- Process

Device alarm simulation

Navigation Diagnostics → Simulation → Dev. alarm sim.

Description Switch the device alarm simulation on or off.

While simulation is in progress, the display alternates between the measured value and a diagnostic message of the Function Check (C) category.

Selection

- Off
- On

Diagnostic event simulation

Navigation Diagnostics → Simulation → Diag. event sim.

Description Select the diagnostic event to simulate.

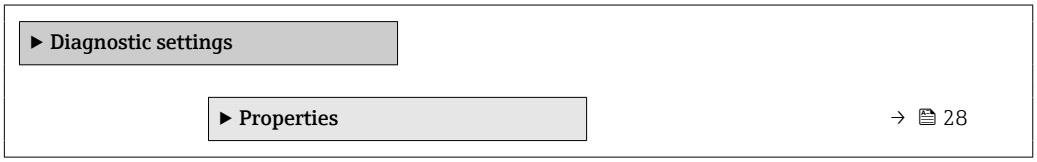
Selection Off

4.4 "Heartbeat" submenu

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

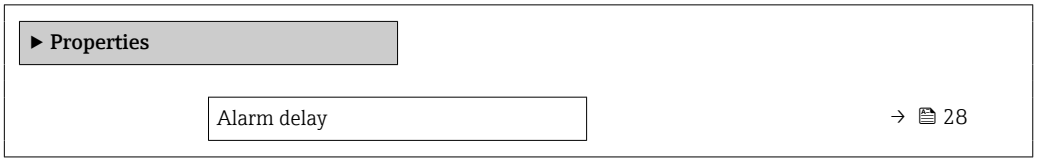
4.5 "Diagnostic settings" submenu

Navigation Diagnostics → Diag. settings



4.5.1 "Properties" submenu

Navigation Diagnostics → Diag. settings → Properties



Alarm delay

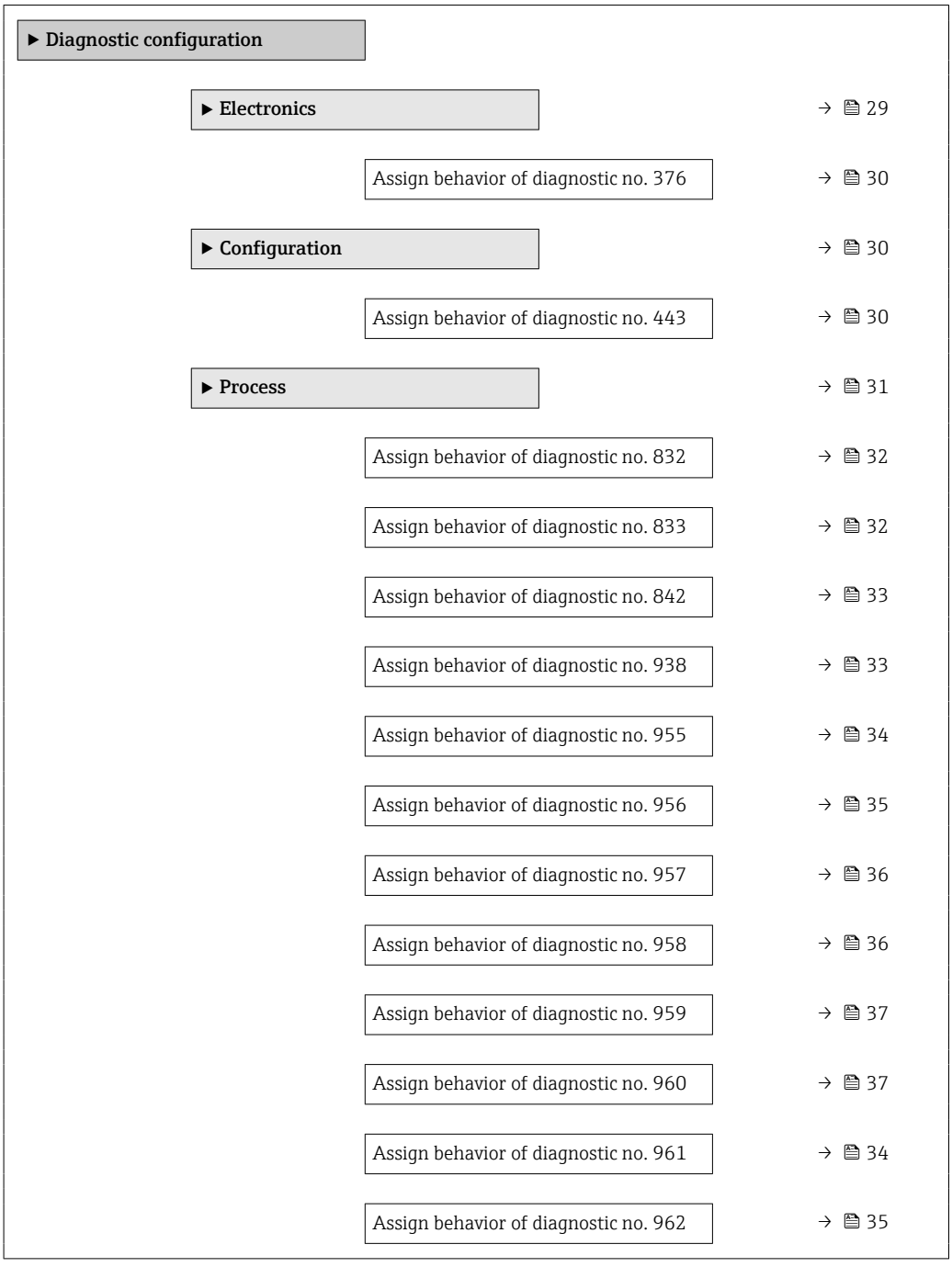
Navigation Diagnostics → Diag. settings → Properties → Alarm delay

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

User entry 0 to 60 s

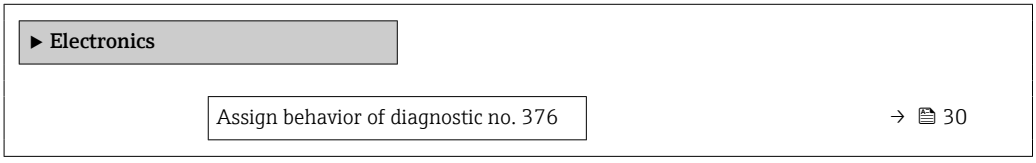
4.5.2 "Diagnostic configuration" submenu

Navigation Diagnostics → Diag. settings → Configuration



"Electronics" submenu

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



Assign behavior of diagnostic no. 376

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

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

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

"Configuration" submenu

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

▶ Configuration		
	Assign behavior of diagnostic no. 443	→ 30

Assign behavior of diagnostic no. 443

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

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

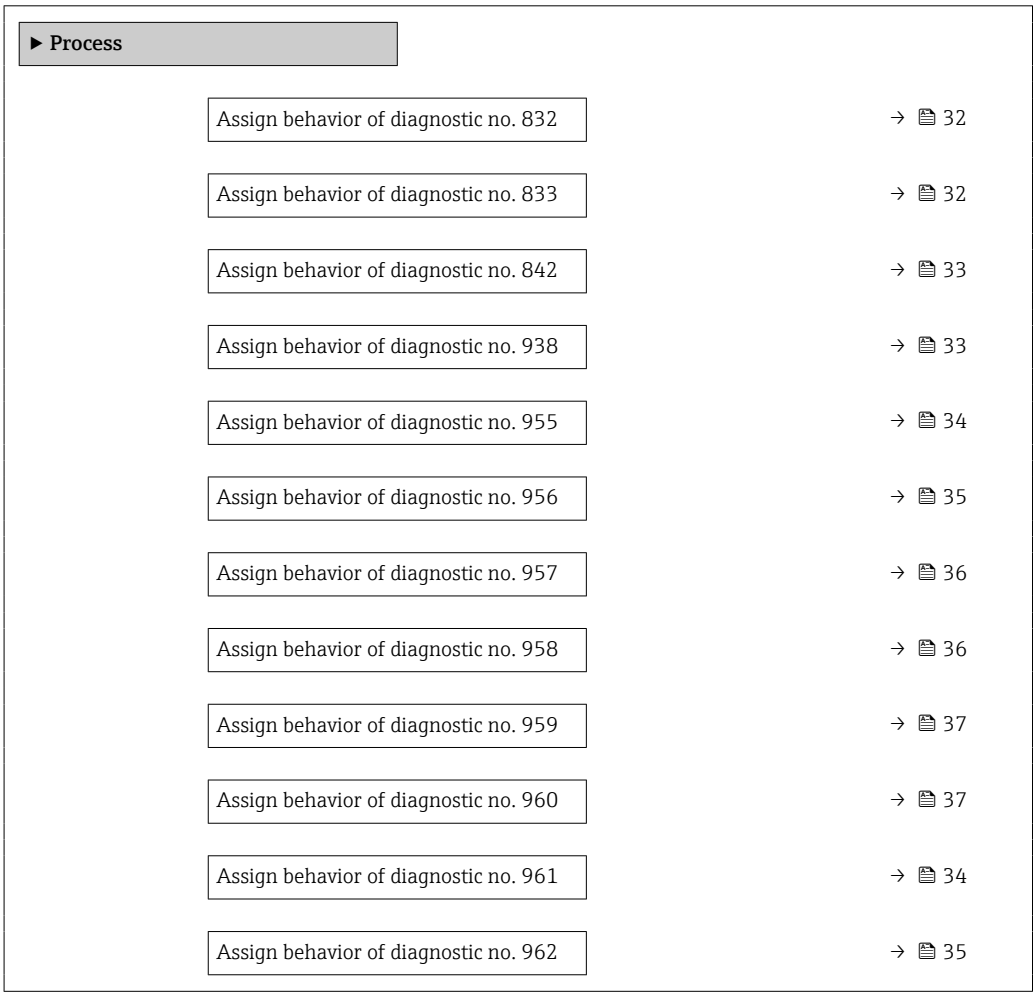
Selection
- Off
- Alarm
- Warning
- Logbook entry only

Additional information *Selection*

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

"Process" submenu

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



Assign behavior of diagnostic no. 832

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

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

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

Assign behavior of diagnostic no. 833

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 833

Description Select behavior for diagnostic event "833 Electronics temperature too low".

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

Assign behavior of diagnostic no. 842

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 842

Description Select behavior for diagnostic event "842 Process value above limit".

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

Assign behavior of diagnostic no. 938

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 938

Description Select behavior for diagnostic event "938 EMC interference".

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

Assign behavior of diagnostic no. 955

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 955

Description Select behavior for diagnostic event "955 Flow limit exceeded".

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

Assign behavior of diagnostic no. 961

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 961

Description Select behavior for diagnostic event "961 Electrode potential out of specification".

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

Assign behavior of diagnostic no. 962

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 962

Description Select behavior for diagnostic event "962 Pipe empty".

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

Assign behavior of diagnostic no. 956

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 956

Description Select behavior for diagnostic event "956 Pressure limit exceeded".

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

Assign behavior of diagnostic no. 957

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 957

Description Select behavior for diagnostic event "957 Time-dependent flow limit exceeded".

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

Assign behavior of diagnostic no. 958

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 958

Description Select behavior for diagnostic event "958 Time-dependent pressure limit exceeded".

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

Assign behavior of diagnostic no. 959

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 959

Description Select behavior for diagnostic event "959 Event at status input detected"..

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

Assign behavior of diagnostic no. 960

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 960

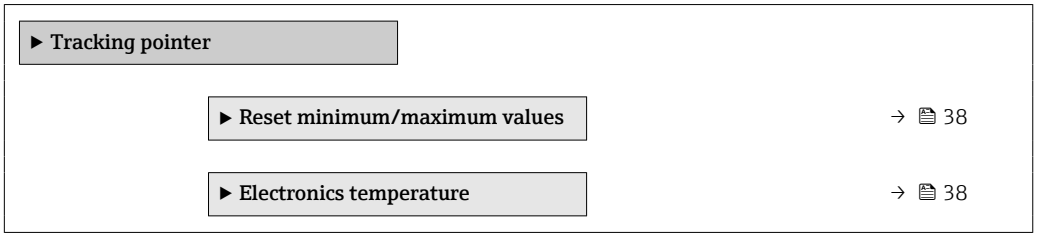
Description Select behavior for diagnostic event "960 Battery lifetime is less than 180 days".

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

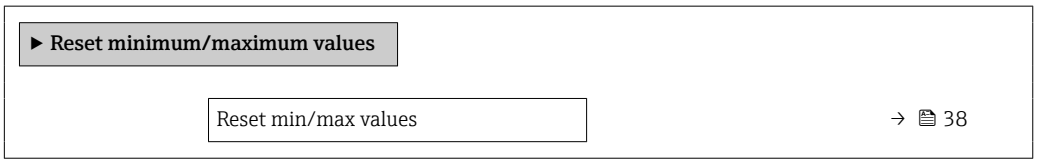
4.6 "Tracking pointer" submenu

Navigation Diagnostics → Tracking pointer



4.6.1 "Reset minimum/maximum values" submenu

Navigation Diagnostics → Tracking pointer → Reset values



Reset min/max values

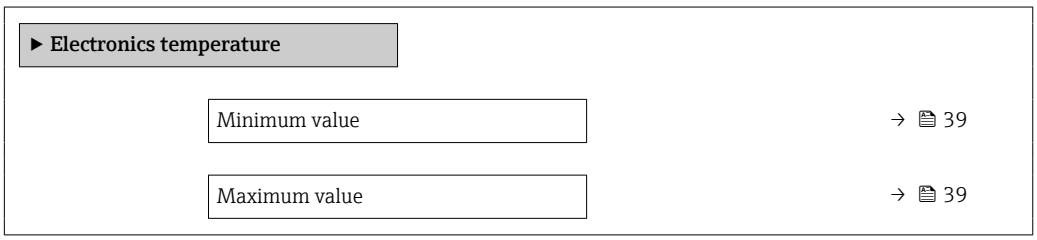
Navigation Diagnostics → Tracking pointer → Reset values → Reset min/max

Description Select the measured variable for which the minimum value and maximum value are to be reset.

Selection Cancel

4.6.2 "Electronics temperature" submenu

Navigation Diagnostics → Tracking pointer → Electronics temp



Minimum value

Navigation Diagnostics → Tracking pointer → Electronics temp → 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 → Tracking pointer → Electronics temp → Maximum value

Description Displays the highest electronics temperature measured so far.

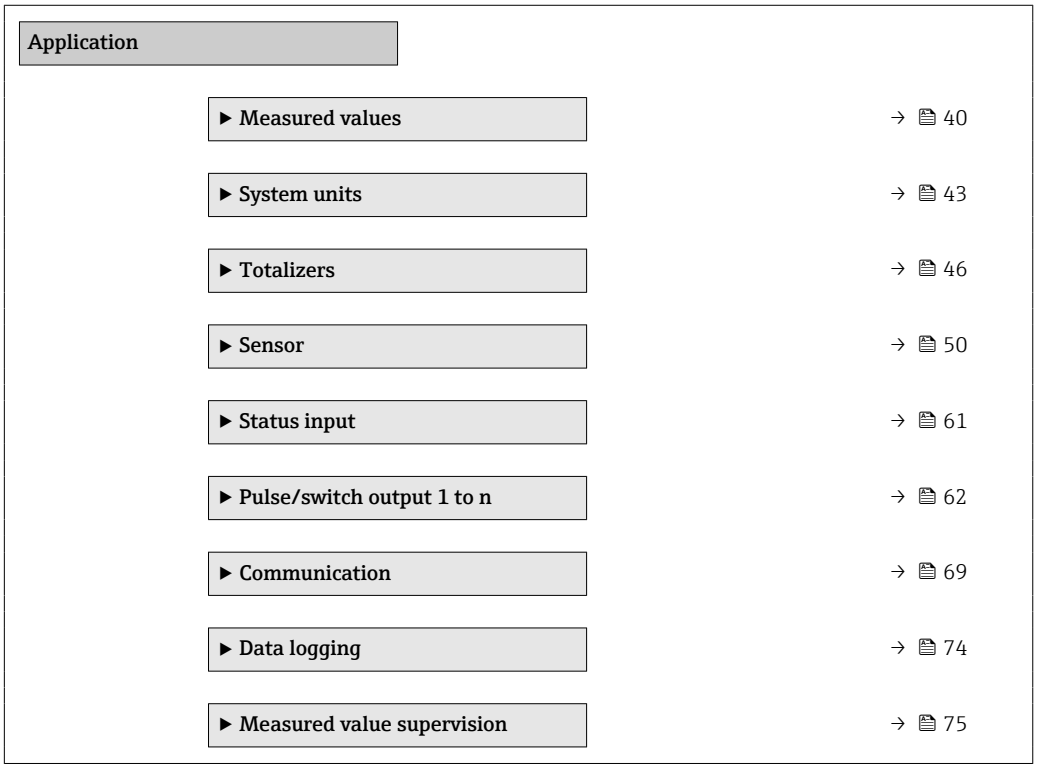
Additional information:
The unit of measure is specified in the "Temperature unit" parameter.

User interface Signed floating-point number

5 "Application" menu

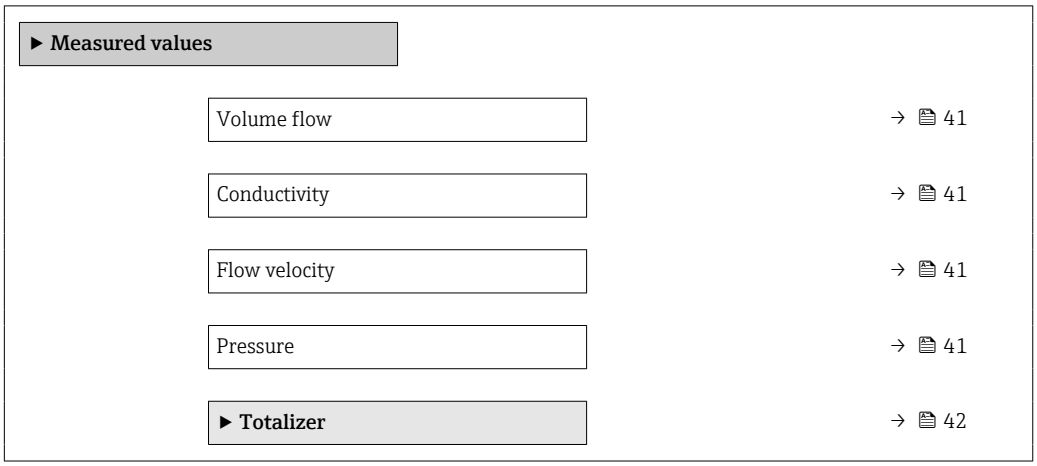
Targeted optimization to the application – comprehensive device settings from sensor technology to system integration for optimum application adaptation.

Navigation Application



5.1 "Measured values" submenu

Navigation Application → Measured values



Volume flow

Navigation Application → Measured values → Volume flow

Description Displays the volume flow currently measured.

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

User interface Signed floating-point number

Conductivity

Navigation Application → Measured values → Conductivity

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 Application → Measured values → 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 Application → Measured values → Pressure

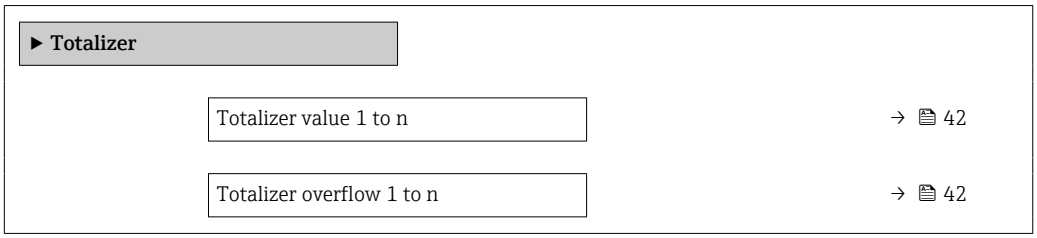
Description Displays the pressure currently measured.

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 Application → Measured values → Totalizer



Totalizer value 1 to n

Navigation Application → Measured values → Totalizer → 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 counter 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 m³
- Value of "Totalizer overflow " parameter: 1 × 107 m³ = 10,000,000 m³
- Current totalizer reading: 11,968,457 m³

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 Application → Measured values → Totalizer → Tot. overflow 1 to n

Description Displays the current totalizer overflow.

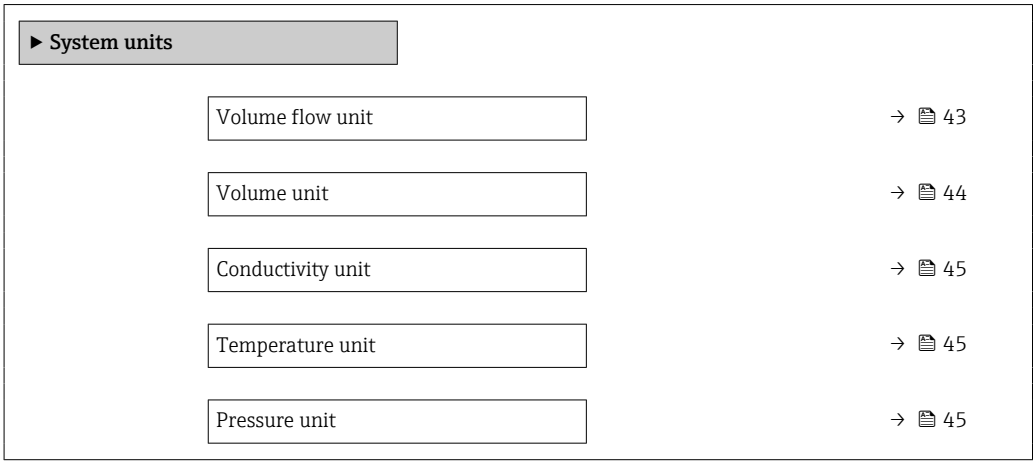
Additional information:
If the current totalizer counter exceeds the operating tool's maximum numerical display range of 7 digits, the amount above this range is expressed as an overflow. The current totalizer counter therefore equals the sum of the overflow and the totalizer value displayed in the "Totalizer 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 m³
- Value of "Totalizer overflow " parameter: 1 × 10^7 m³ = 10,000,000 m³
- Current totalizer reading: 11,968,457 m³

User interface −32 000.0 to 32 000.0

5.2 " Units" submenu

Navigation Application → Units



Volume flow unit

Navigation Application → System units → Volume flow unit

Description Select volume flow unit.

Selection

SI units
- cm^3/s
- cm^3/min
- cm^3/h
- cm^3/d
- dm^3/s
- dm^3/min
- dm^3/h
- dm^3/d
- m^3/s
- m^3/min
- m^3/h
- m^3/d
- ml/s
- ml/min
- ml/h
- ml/d
- l/s
- l/min
- l/h
- l/d
- 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^3/min
- ft^3/h
- ft^3/d
- $MMft^3/s$
- $MMft^3/min$
- $MMft^3/h$
- Mft^3/d
- fl oz/s (us)
- fl oz/min (us)
- fl oz/h (us)
- fl oz/d (us)
- gal/s (us)
- gal/min (us)
- gal/h (us)
- gal/d (us)
- 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)
- kgal/s (us)
- kgal/min (us)
- kgal/h (us)
- kgal/d (us)

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)

Volume unit

Navigation Application → System units → Volume unit

Description Select volume unit.

Selection

SI units
- cm^3
- dm^3
- m^3
- ml
- l
- hl
- Ml Mega

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

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

Conductivity unit

Navigation Application → System units → Conductiv. unit

Description Select conductivity unit.

Selection

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

Temperature unit

Navigation Application → System units → Temperature unit

Description Select temperature unit.

Selection

SI units
- °C
- K

US units
- °F
- °R

Pressure unit

Navigation Application → System units → Pressure unit

Description Select process pressure unit.

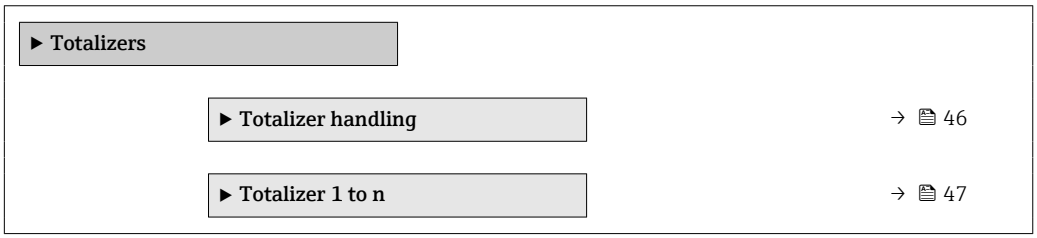
Selection

SI units
- MPa a
- MPa g
- kPa a
- kPa g
- Pa a
- Pa g
- bar
- bar g

US units
- psi a
- psi g

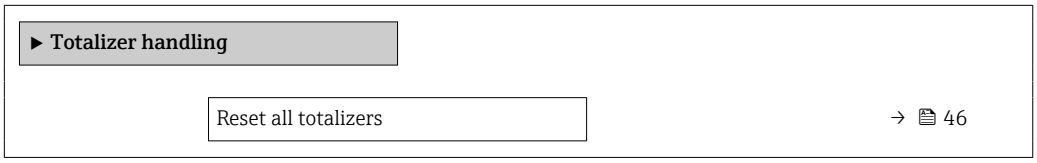
5.3 "Totalizers" submenu

Navigation Application → Totalizers



5.3.1 "Totalizer handling" submenu

Navigation Application → Totalizers → Totalizer



Reset all totalizers

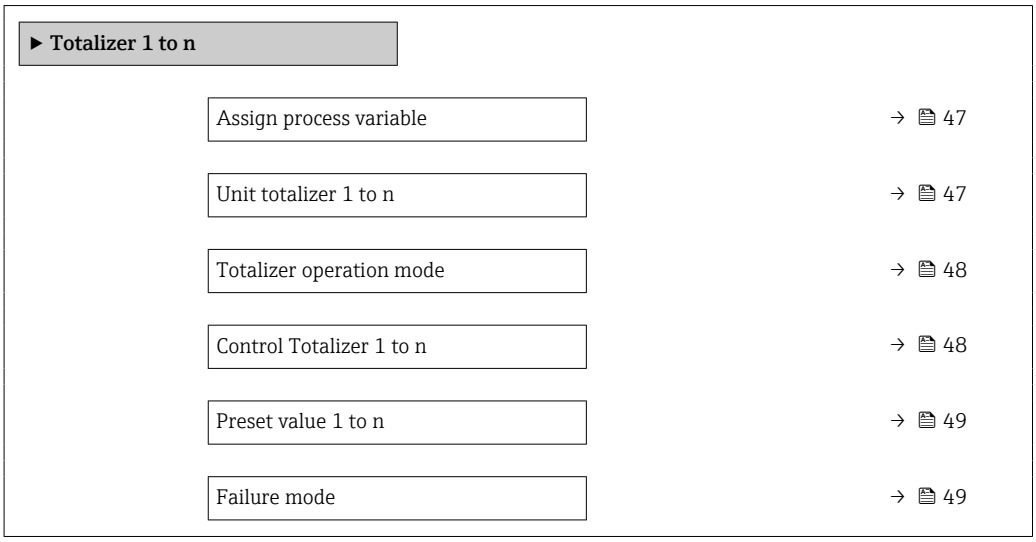
Navigation Application → Totalizers → Totalizer → Reset all tot.

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

Selection
- Cancel
- Reset + totalize

5.3.2 "Totalizer 1 to n" submenu

Navigation Application → Totalizers → Totalizer 1 to n



Assign process variable

Navigation Application → Totalizers → Totalizer 1 to n → Assign variable

Description Select process variable for totalizer.

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

Selection
- Off
- Volume flow

Unit totalizer 1 to n

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

Description Select process variable totalizer unit.

Selection

SI units
- cm^3 *
- dm^3 *
- m^3 *
- ml *
- l *
- hl *
- Ml Mega *

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

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

* Visibility depends on order options or device settings

or

Other units
None *

* Visibility depends on order options or device settings

Totalizer operation mode

Navigation Application → Totalizers → Totalizer 1 to n → Operation mode

Description Select totalizer calculation mode.

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

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

Control Totalizer 1 to n

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

Description Operate the totalizer.

Selection
- Totalize
- Reset + hold
- Preset + hold
- Reset + totalize
- Hold

Additional information *Selection*
- **Totalize** option
  The totalizer is started or continues running.
- **Reset + hold** option
  The totaling process is stopped and the totalizer is reset to "0".
- **Preset + hold** option
  The totaling process is stopped and the totalizer is set to the start value specified in the "Preset value " parameter.
- **Reset + totalize** option
  The totalizer is reset to "0" and the totaling process is restarted.
- **Hold** option
  Totalizing is stopped.

Preset value 1 to n

Navigation Application → Totalizers → Totalizer 1 to n → Preset value 1 to n

Description Specify start value for totalizer.

User entry Signed floating-point number

Failure mode

Navigation Application → Totalizers → Totalizer 1 to n → 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.

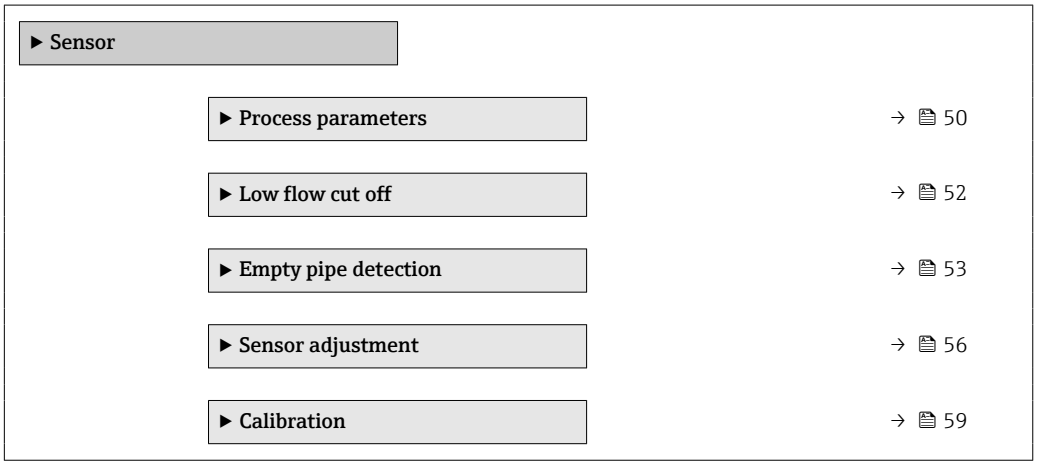
Selection
- Stop
- Actual value
- Last valid value

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.

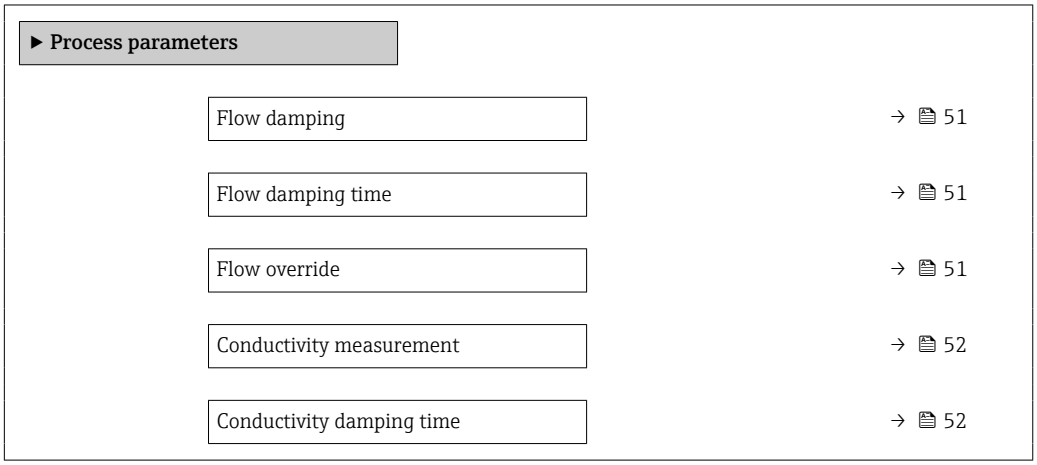
5.4 "Sensor" submenu

Navigation Application → Sensor



5.4.1 "Process parameters" submenu

Navigation Application → Sensor → Process param.



Flow damping

Navigation Application → Sensor → Process param. → 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

Navigation Application → Sensor → Process param. → 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 → Sensor → Process param. → Flow override

Description Stops the measuring process. Can be used for example when cleaning the pipeline.

Selection
- Off
- On

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 → Sensor → Process param. → 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 5 µS/cm.

Selection
- Off
- On

Conductivity damping time

Navigation Application → Sensor → Process param. → ConductDampTime

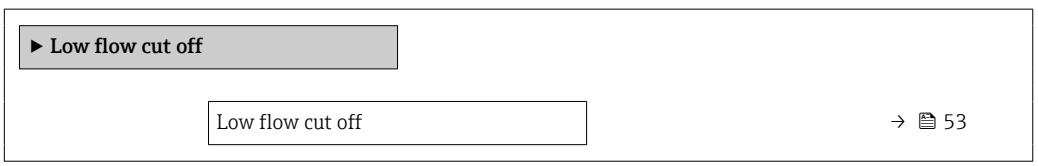
Description Enter time constant for conductivity damping (PT1 element):
- Value = 0: No damping
- Value > 0: Damping increases

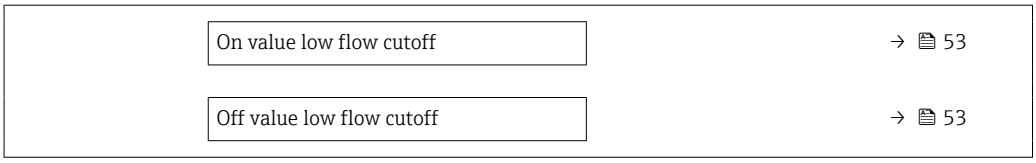
Additional information:
Damping is implemented by means of a proportional transmission behavior with first order delay (PT1 element).

User entry 0 to 999.9 s

5.4.2 "Low flow cut off" submenu

Navigation Application → Sensor → Low flow cut off





Low flow cut off

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

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

Selection
- Off
- Volume flow

On value low flow cutoff

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

Description Enter on value to switch on low flow cut off.

Value = 0: No low flow cut off
Value > 0: Low flow cut off is activated

User entry Positive floating-point number

Off value low flow cutoff

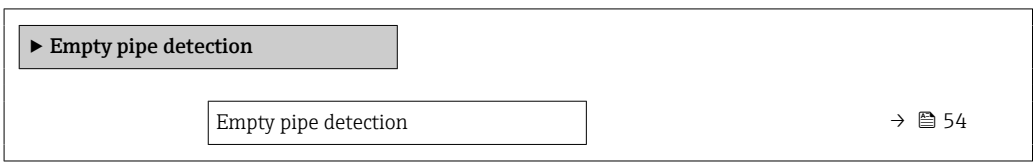
Navigation Application → Sensor → Low flow cut off → Off value

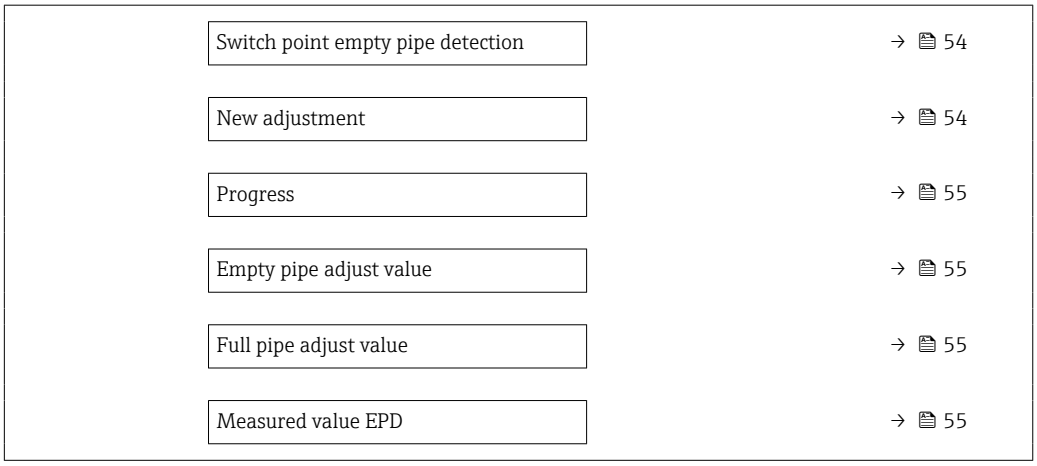
Description Enter off value to switch off low flow cut off. The off value is entered as a positive hysteresis with respect to the on value.

User entry 0 to 100.0 %

5.4.3 "Empty pipe detection" submenu

Navigation Application → Sensor → Empty pipe det.





Empty pipe detection

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

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

Selection
- Off
- On

Switch point empty pipe detection

Navigation Application → Sensor → Empty pipe det. → 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 → Sensor → Empty pipe det. → New adjustment

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

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

Selection
- Cancel
- Empty pipe adjust
- Full pipe adjust

Progress

Navigation Application → Sensor → Empty pipe det. → Progress

Description Shows the progress of the process.

User interface
- Ok
- Busy
- Not ok

Empty pipe adjust value

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

Description Displays adjustment value when the measuring tube is empty.

NOTE
Users logged on in the Service role have write access!

User interface Positive floating-point number

Full pipe adjust value

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

Description Displays adjustment value when the measuring tube is full.

NOTE
Users logged on in the Service role have write access!

User interface Positive floating-point number

Measured value EPD

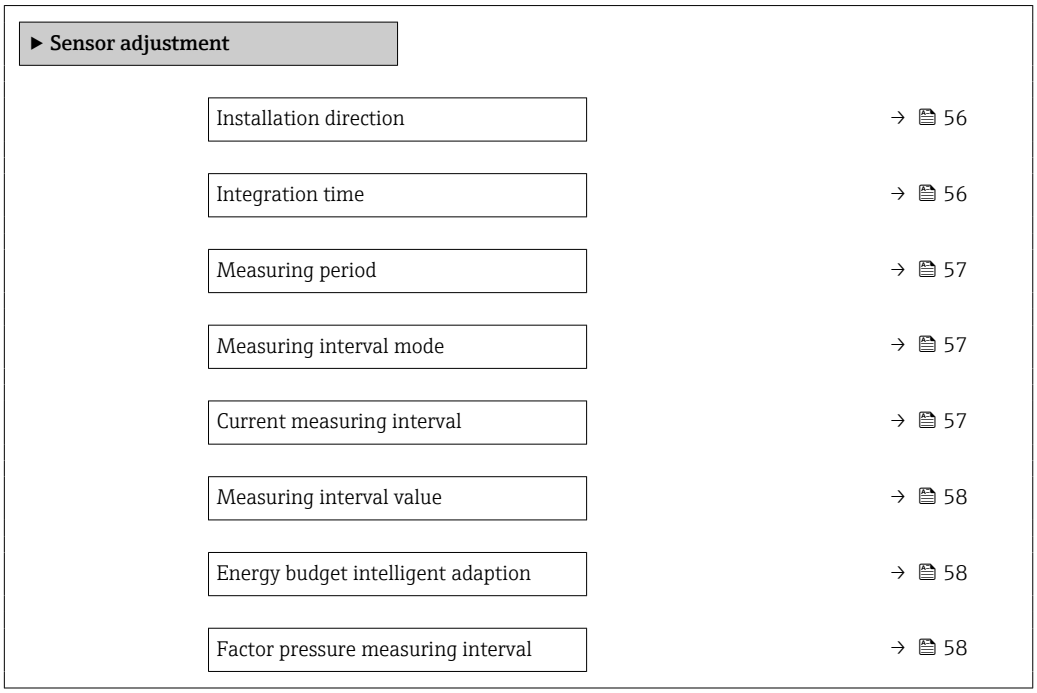
Navigation Application → Sensor → Empty pipe det. → Meas. value EPD

Description Displays the value currently measured for empty pipe detection.

User interface Positive floating-point number

5.4.4 "Sensor adjustment" submenu

Navigation Application → Sensor → Sensor adjustm.



Installation direction

Navigation Application → Sensor → Sensor adjustm. → Install. direct.

Description Select sign of flow direction

Selection
- Forward flow
- Reverse flow

Integration time

Navigation Application → Sensor → Sensor adjustm. → Integration time

Description Displays the duration of an integration cycle.

NOTE
Users logged on in the Service role have write access!

User interface 1 to 65 ms

Measuring period

Navigation Application → Sensor → Sensor adjustm. → Measuring period

Description Displays the duration of a full measuring period.

Additional information:
The measuring period is the time span during which the excitation of the magnetic field takes place and a measuring point is created.

NOTE
Users logged on in the Service role have write access!

User interface 0 to 1 000 ms

Measuring interval mode

Navigation Application → Sensor → Sensor adjustm. → MeasurIntervMod

Description Select measuring interval mode. The measuring interval is the time span between two measuring periods.

Selection
- Fixed value
- Intelligent adaptation

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 the usage rate specified in the "Energy budget intelligent adaption" parameter. This option is recommended to optimize the measuring result.

Current measuring interval

Navigation Application → Sensor → Sensor adjustm. → Cur.meas.interv.

Description Shows the measuring interval currently used.

User interface Positive floating-point number

Measuring interval value

Navigation Application → Sensor → Sensor adjustm. → 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 result, set as short an interval as possible.

User entry 0 to 60 s

Energy budget intelligent adaption

Navigation Application → Sensor → Sensor adjustm. → Energy budget

Description Set the energy budget.

Additional information:
- Value = 100%: Energy budget usage is maximized. The measuring device adapts the measuring interval to flow changes frequently.
- 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 of the energy budget is maximized.
- Value = 1%: Low energy budget usage. The measuring device does not frequently adapt the measuring interval to flow changes.

NOTE
The higher the energy budget usage, the shorter the battery life span!

User entry 1 to 100 %

Factor pressure measuring interval

Navigation Application → Sensor → Sensor adjustm. → FactMeasurInterv

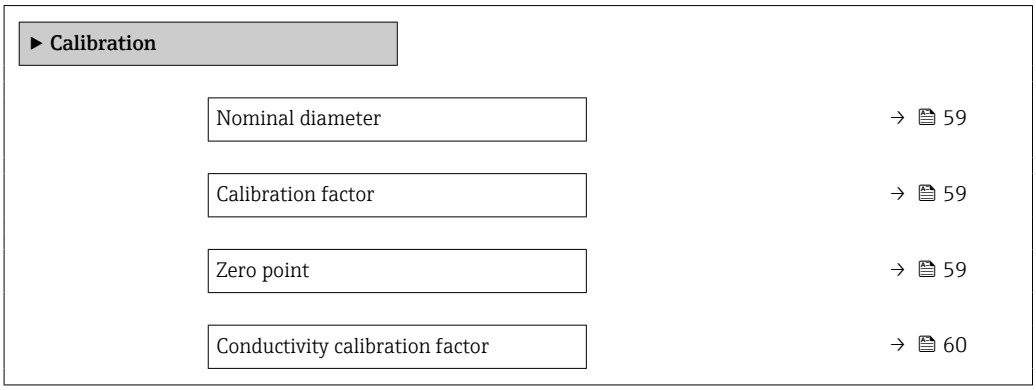
Description Enter factor for pressure measuring interval as a multiple of the measuring interval. To increase battery life, enter as large of a factor as possible.

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

Navigation Application → Sensor → Calibration



Nominal diameter

Navigation Application → Sensor → Calibration → Nominal diameter

Description Shows the nominal diameter of the sensor.

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

Calibration factor

Navigation Application → Sensor → Calibration → Cal. factor

Description Displays the current calibration factor for the flow rate measuring sensor.

Additional information:
The factory setting for the calibration factor can be found on the sensor's nameplate.

User interface Positive floating-point number

Zero point

Navigation Application → Sensor → Calibration → Zero point

Description Displays the zero point correction value for the sensor.

NOTE
Users logged on in the Service role have write access!

User interface Signed floating-point number

Conductivity calibration factor

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

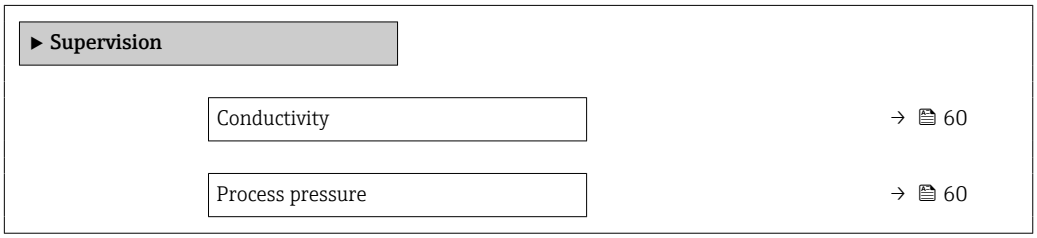
Description Displays calibration factor for conductivity measurement.

NOTE
Users logged on in the Service role have write access!

User interface 0.01 to 10 000

5.4.6 "Supervision" submenu

Navigation Application → Sensor → Supervision



Conductivity

Navigation Application → Sensor → Supervision → 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

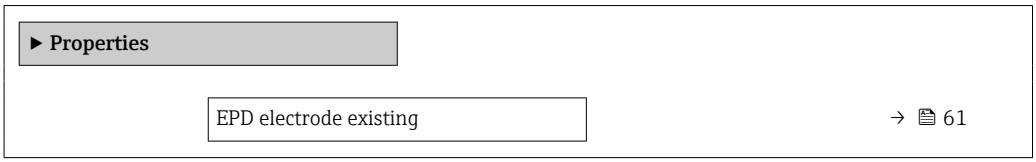
Navigation Application → Sensor → Supervision → Process pressure

Description Displays the currently measured process pressure.

User interface Signed floating-point number

5.4.7 "Properties" submenu

Navigation Application → Sensor → Properties



EPD electrode existing

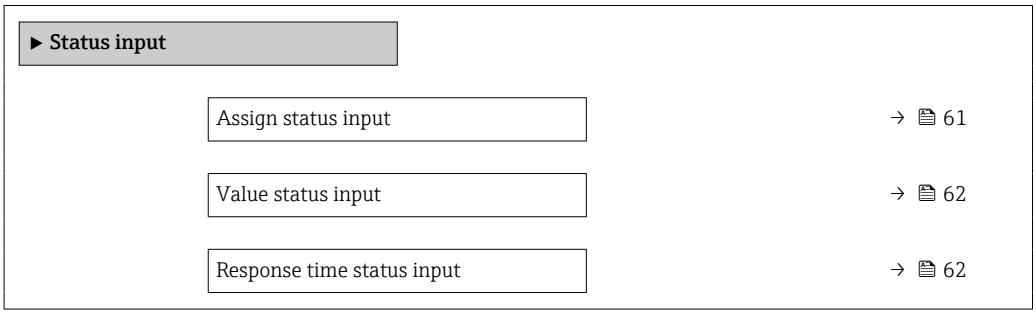
Navigation Application → Sensor → Properties → EPD electrode

Description Shows whether the empty pipe detection electrode exists.

User interface
- No
- Yes

5.5 "Status input" submenu

Navigation Application → Status input



Assign status input

Navigation Application → Status input → 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
- Off
- Reset totalizer 1
- Reset totalizer 2

- Reset totalizer 3
- Reset all totalizers
- Generate logbook entry

Additional information *Selection*

"Generate logbook entry" option
If the condition of the status input changes, a logbook entry is created.

Value status input

Navigation Application → Status input → 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
- High
- Low

Response time status input

Navigation Application → Status input → Response time

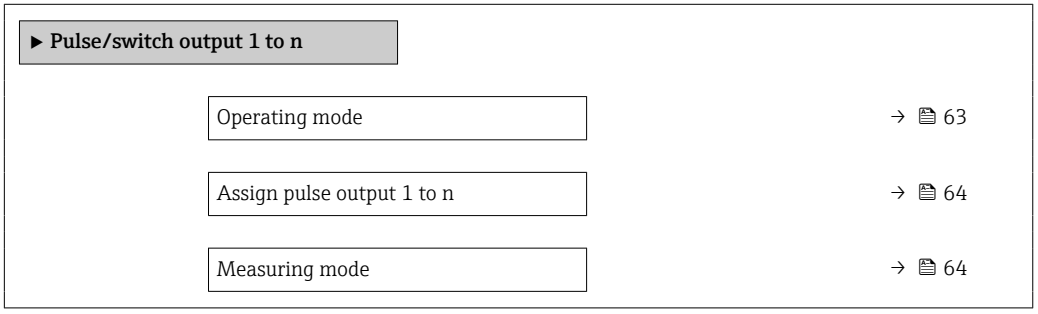
Description Specify the minimum amount of time the input signal level must be present before the selected function is triggered.

User entry 50 to 200 ms

5.6 "Pulse/switch output 1 to n" submenu

Configuring the pulse/frequency/switch output

Navigation Application → Pulse/switch 1 to n



Operating mode

Navigation Application → Pulse/switch 1 to n → Operating mode

Description Set the output mode to pulse or switch.

Selection
- Pulse
- Switch

Additional information *Selection*

- **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.
- **Switch** option
  Indicates when the state of the device changes, e.g. when a specified limit value is reached.
  Additional information:
  - The switch output can be in one of two states: either it is conductive or it is non-conductive.
  - When the function assigned to the switch output is triggered, the switch output will depending on the output configuration either be continuously conductive or continuously non-conductive 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.
  - 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.

Assign pulse output 1 to n

Navigation Application → Pulse/switch 1 to n → Assign pulse 1 to n

Description Select process variable for pulse output.

Selection
- Off
- Volume flow

Measuring mode

Navigation Application → Pulse/switch 1 to n → Measuring mode

Description Select measuring mode for pulse output.

Selection
- Forward flow
- Forward/Reverse flow
- Reverse flow

Additional information *Selection*

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

Switch output function

Navigation Application → Pulse/switch 1 to n → 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.

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

Additional information *Selection*
- **Off** option
  The switch output is permanently switched off (open, non-conductive).
- **On** option
  The switch output is permanently switched on (closed, conductive).
- **Diagnostic behavior** option
  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 behavior

Navigation Application → Pulse/switch 1 to n → Assign diag. beh

Description Select the diagnostic behavior for which the switch output should emit a pulse.

Selection
- Alarm
- Alarm or warning
- Warning

Additional information *Selection*
- **Alarm** option
  The switch output only emits a pulse for diagnostic events of the "Alarm" category.
- **Alarm or warning** option
  The switch output emits a pulse for diagnostic events of the "Alarm" or "Warning" category.
- **Warning** option
  The switch output only emits a pulse for diagnostic events of the "Warning" category.

Assign limit

Navigation Application → Pulse/switch 1 to n → 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
- Off
- Volume flow
- Flow velocity
- Conductivity *
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Pressure *
- Battery state of charge

Assign status

Navigation Application → Pulse/switch 1 to n → 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 is conductive. Otherwise, the switch output is non-conductive.

Selection
- Empty pipe detection
- Low flow cut off

Value per pulse

Navigation Application → Pulse/switch 1 to n → 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

* Visibility depends on order options or device settings

Pulse width

Navigation Application → Pulse/switch 1 to n → 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

Failure mode

Navigation Application → Pulse/switch 1 to n → 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
- Actual value
- No pulses

Additional information *Selection*

- **Actual value** option
  In the event of a device alarm, the pulse output continues based on the current flow measurement. The issue is ignored.
  Additional information:
  A device alarm indicates a serious malfunction of the measuring device that may impact the measurement quality to the point that accuracy can no longer be ensured. This option is only recommended if the necessary safeguards are in place to ensure that no alarm condition can impact the measurement quality.
- **No pulses** option
  In the event of a device alarm, the pulse output is switched off.

Switch-on value

Navigation Application → Pulse/switch 1 to n → 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 Application → Pulse/switch 1 to n → Switch-off value

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

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

User entry Signed floating-point number

Failure mode

Navigation Application → Pulse/switch 1 to n → 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
- Actual status
- Open
- Closed

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

Assign flow direction check

Navigation Application → Pulse/switch 1 to n → Assign dir.check

Description Select process variable for flow direction monitoring.

Selection
- Off
- Volume flow

Switch state 1 to n

Navigation Application → Pulse/switch 1 to n → Switch state 1 to n

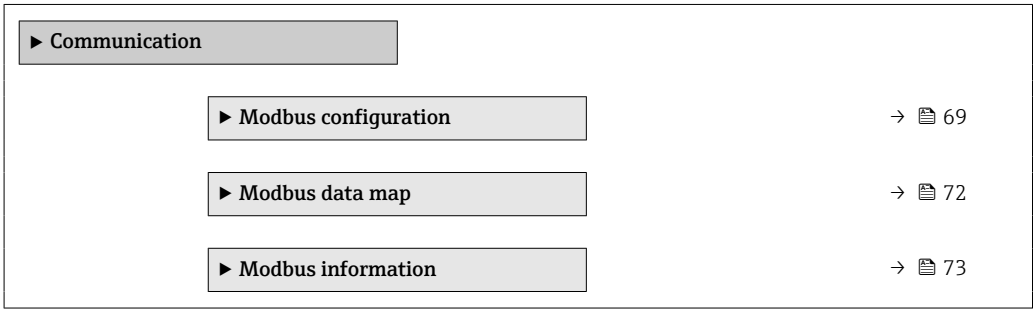
Description Indicates the current switch output status.

User interface
- Open
- Closed

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

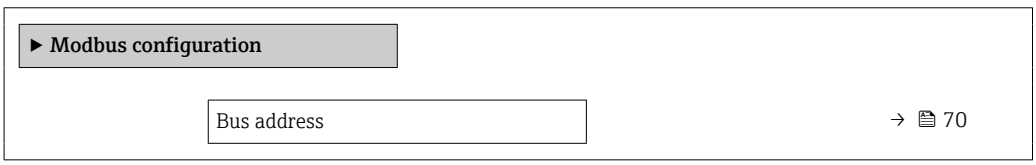
5.7 "Communication" submenu

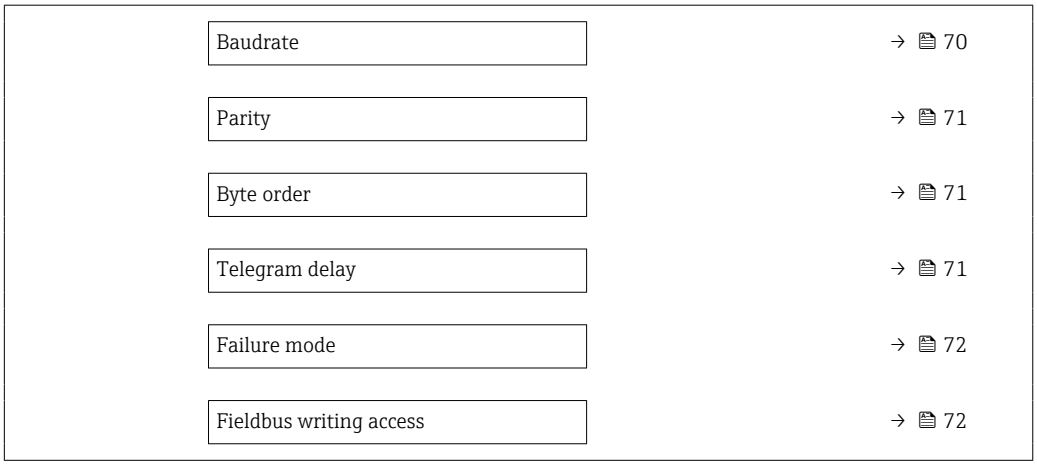
Navigation Application → Communication



5.7.1 "Modbus configuration" submenu

Navigation Application → Communication → Modbus config.





Bus address

Navigation Application → Communication → Modbus config. → Bus address

Description Enter device address.

User entry 1 to 247

Baudrate

Navigation Application → Communication → Modbus config. → Baudrate

Description Define data transfer speed.

Selection
- 1200 BAUD
- 2400 BAUD
- 4800 BAUD
- 9600 BAUD
- 19200 BAUD
- 38400 BAUD
- 57600 BAUD
- 115200 BAUD

Parity

Navigation Application → Communication → Modbus config. → Parity

Description Select parity bits.

Additional information:
"ASCII" picklist option:
- 0 = "Even" option
- 1 = "Odd" option

"RTU" picklist option:
- 0 = "Even" option
- 1 = "Odd" option
- 2 = "No parity bit/1 stop bit" option
- 3 = "No parity bit/2 stop bits" option

Selection
- Odd
- Even
- None / 1 stop bit
- None / 2 stop bits

Byte order

Navigation Application → Communication → Modbus config. → Byte order

Description Select byte transmission sequence. The transmission sequence must be coordinated with the Modbus master.

Additional information:
The byte sequence is not standardized by the Modbus protocol. However, if the host system and the measuring device do not use the same byte sequence, correct data exchange is not possible.

Changing the byte sequence in the host system often requires extensive knowledge and significant programming effort. This parameter can be used to keep the standard settings of the host system, while adjusting the byte sequence on the measuring device by means of trial and error. If it is not possible to achieve correct data exchange in this manner, then it is the host system's settings for the byte sequence that must be modified.

Selection
- 0-1-2-3
- 3-2-1-0
- 1-0-3-2
- 2-3-0-1

Telegram delay

Navigation Application → Communication → Modbus config. → Telegram delay

Description Enter a delay time after which the measuring device replies to the request telegram of the Modbus master. This is to enable communication with slow Modbus RS485 masters.

User entry 0 to 100 ms

Failure mode

Navigation Application → Communication → Modbus config. → Failure mode

Description Select the preferred Modbus communication output mode for the measured value, when a diagnostic event of the category specified in the "Assign diagnostic behavior" parameter occurs.

Selection
- NaN value
- Last valid value

Additional information *Selection*
- **NaN value** option
  The device outputs the NaN value ("Not a number" value).
- **Last valid value** option
  The device displays the last valid measured value before the issue occurred.

Fieldbus writing access

Navigation Application → Communication → Modbus config. → Fieldb.writ.acc.

Description Restrict access to the measuring device via Fieldbus.

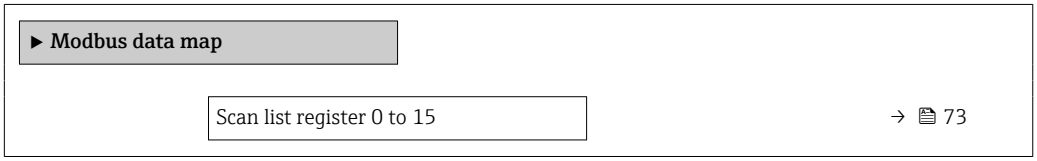
Additional information:
Once read and/or write protection has been enabled, this parameter can only be accessed and reset via local operation. Access via an operating tool is no longer possible.

NOTE
The cyclical transmission of measured values to the higher-order system is not impacted by these restrictions and always guaranteed!

Selection
- Read + write
- Read only

5.7.2 "Modbus data map" submenu

Navigation Application → Communication → Modbus data map



Scan list register 0 to 15

Navigation Application → Communication → Modbus data map → Scan list reg.0 to 15

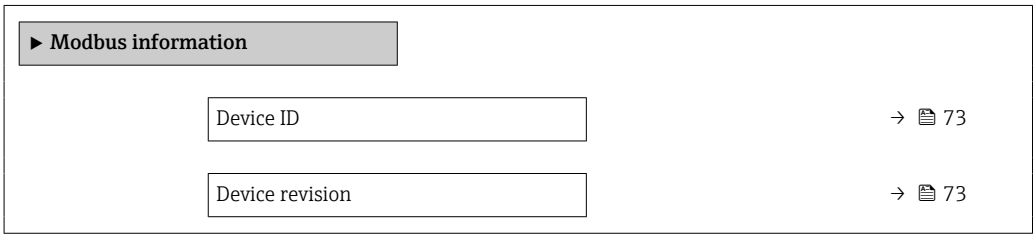
Description Enter the scan list register.

Additional information:
By entering the register address (1-based), it is possible to group up to 16 device parameters, which thereby are assigned to the scan list registers 0 to 15. The data corresponding to the device parameters assigned is read out via the register addresses 5051 to 5081.

User entry 0 to 65 535

5.7.3 "Modbus information" submenu

Navigation Application → Communication → Modbus info



Device ID

Navigation Application → Communication → Modbus info → Device ID

Description Displays the device ID to identify the measuring device.

User interface 0 to 65 535

Device revision

Navigation Application → Communication → Modbus info → Device revision

Description Displays device revision.

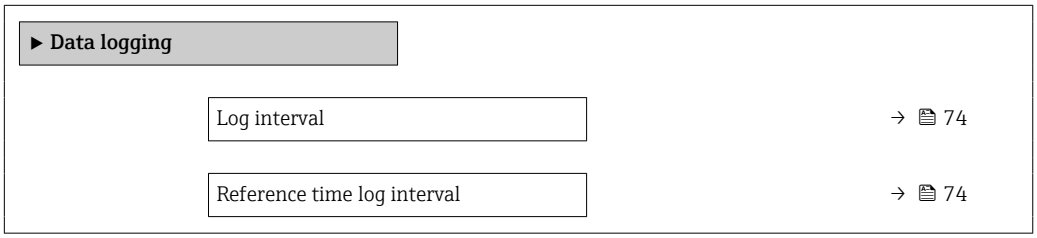
User interface 0 to 65 535

5.8 "Custody transfer" submenu

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

5.9 "Data logging" submenu

Navigation Application → Data logging



Log interval

Navigation Application → Data logging → Log interval

Description Select the interval at which to log measured values.

Selection
- 15 seconds
- 30 seconds
- 1 minute
- 5 minutes
- 10 minutes
- 15 minutes
- 30 minutes
- 1 hour
- 2 hours
- 4 hours
- 6 hours
- 12 hours
- 24 hours

Reference time log interval

Navigation Application → Data logging → 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

5.10 "Measured value supervision" submenu

Navigation Application → MeasValSupervis.

Upper flow limit value

Navigation Application → MeasValSupervis. → 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

Navigation Application → MeasValSupervis. → Lower flow limit

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.

User entry Signed floating-point number

Upper pressure limit value

Navigation Application → MeasValSupervis. → UppPressureLimit

Description Enter the upper pressure limit value to monitor the pressure. If the pressure is higher than the specified limit value, the measuring device generates a diagnostic message.

User entry Positive floating-point number

Lower pressure limit value

Navigation Application → MeasValSupervis. → LowPressureLimit

Description Enter the lower pressure limit value to monitor the pressure. If the pressure is lower than the specified limit value, the measuring device generates a diagnostic message.

User entry Positive floating-point number

Time-dependent upper flow limit value

Navigation Application → MeasValSupervis. → TimedepUpperFlow

Description Enter an upper flow limit value to monitor the flow for the specified time span. If the flow within the specified time span is greater 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 Signed floating-point number

Time-dependent lower flow limit value

Navigation Application → MeasValSupervis. → TimedepLowerFlow

Description Enter a lower flow limit value to monitor the flow for the specified time span. If the flow within the specified time span is less 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 Signed floating-point number

Time-depen. upper pressure limit value

Navigation Application → MeasValSupervis. → TimedepUppPress

Description Enter an upper pressure limit value to monitor the pressure for the specified time span. If the pressure within the specified time span is higher 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

Time-depen. lower pressure limit value

Navigation Application → MeasValSupervis. → 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 Application → MeasValSupervis. → 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 Application → MeasValSupervis. → End time limits

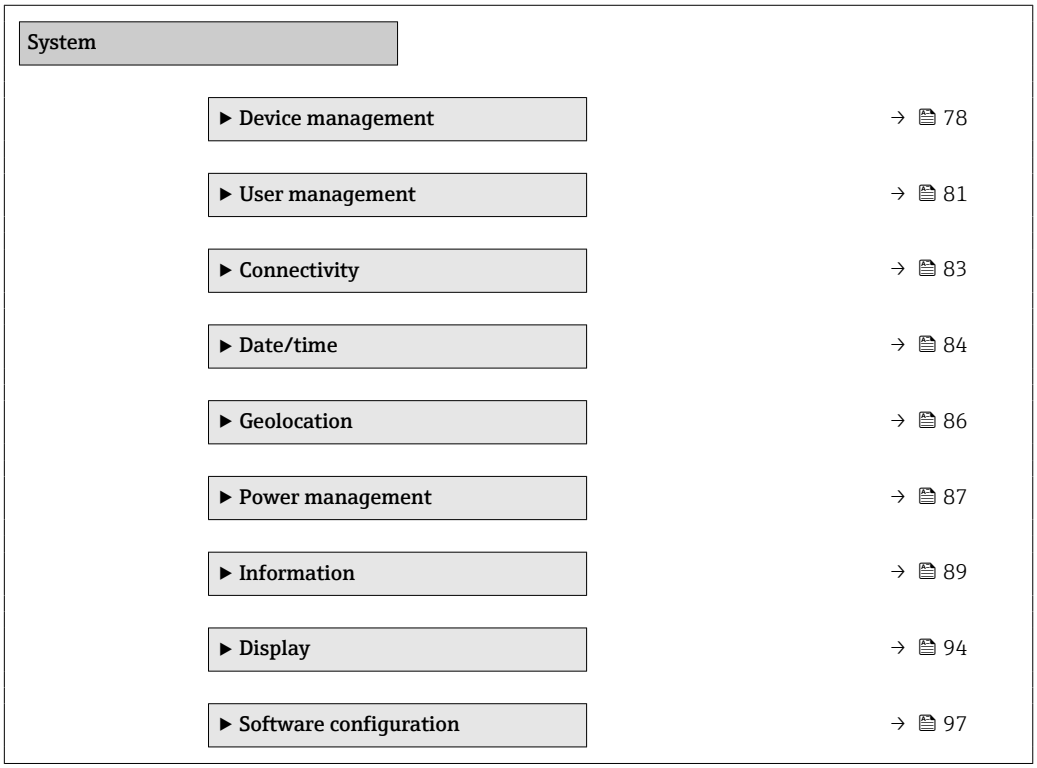
Description Enter the end time for the time period that applies to the time-dependent flow and pressure limit values.

User entry Positive integer

6 "System" menu

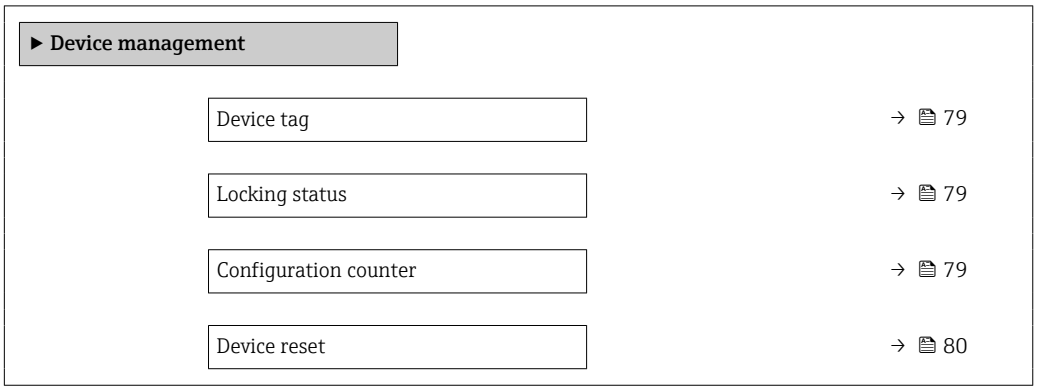
Overall device management and security settings – management of system settings and adaption to operational requirements.

Navigation System



6.1 "Device management" submenu

Navigation System → Device manag.



Device tag

Navigation System → Device manag. → Device tag

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

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

Locking status

Navigation System → Device manag. → Locking status

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

User interface
- Hardware locked
- CT active - defined parameters
- CT active - all parameters
- Temporarily locked

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

Configuration counter

Navigation System → Device manag. → Config. counter

Description Displays the counter for changes to the device parameters.

Additional information:
- If the value for a static parameter is changed when optimizing or configuring the parameter, the counter is incremented by 1. This is to enable tracking different parameter versions.
- When multiple parameters are changed simultaneously, e.g. when loading parameters into the device from an external source such as FieldCare, the counter may display a higher value. The counter cannot be reset, nor is it reset to a default value on performing a device reset.
- Once the counter has reached the value 65535, it restarts at 0.

User interface 0 to 65 535

Device reset

Navigation System → Device manag. → Device reset

Description Reset the device configuration - either entirely or in part - to a defined state.

Selection
- Cancel
- To delivery settings
- Restart device
- Restore S-DAT backup *
- Shut down device
- Create T-DAT backup
- Restore T-DAT backup *

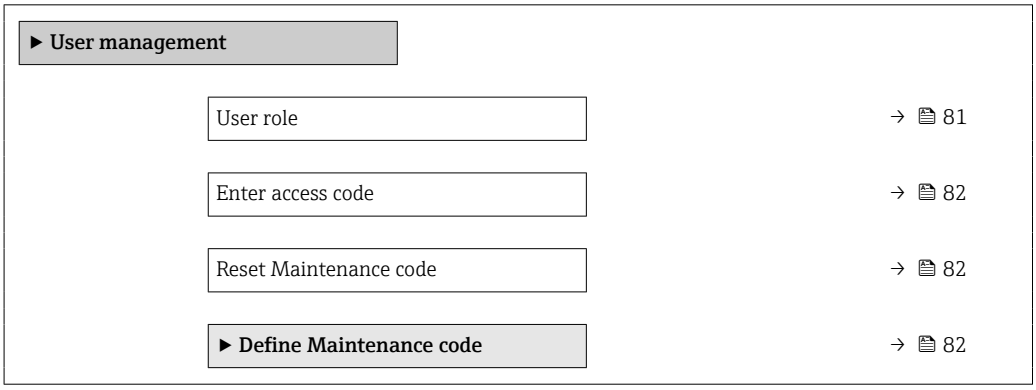
Additional information *Selection*
- **To delivery settings** option
  Every parameter for which a customer-specific default setting was ordered is reset to the customer-specific value. All other parameters are reset to the factory setting.
- **Restart device** option
  The restart resets every parameter with data stored in volatile memory (RAM) to the factory setting (e.g. measured value data). The device configuration remains unchanged.
- **Delete powerfail data** option
  Deletes the powerfail data segment in the T-DAT or (if applicable) the T-DAT partition of the S-DAT.
  Additional information:
  This function resolves the following memory content error: "283 Memory content inconsistent" with Service ID 225 and Service ID 721.
- **Delete T-DAT** option
  Deletes the T-DAT or (if applicable) the T-DAT partition of the S-DAT. On performing this delete operation, all parameters on the T-DAT are reset to the default values.
  Additional information:
  This function can be used to resolve any memory content issue on the T-DAT.
  NOTE
  The powerfail data and device delivery settings will no longer be available on performing this delete operation!
- **Reset faulty parameters** option
  Resets all faulty parameters to default values when the following memory content error occurs: "283 Memory content inconsistent" with Service ID 367.
  Additional information:
  Only faulty parameters are reset. All parameters that are reset are logged in the logbook.

* 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!
- **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.

6.2 "User management" submenu

Navigation System → User manag.



User role

Navigation System → User manag. → User role

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

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

User interface
- Operator
- Maintenance
- Service
- Production
- Development

Additional information *User interface*

- **Operator** option
  Provides only read access to parameters.
- **Maintenance** option
  Provides read and write access to parameters.
  Additional information:
  For some parameters, the user must be logged on in the Service role to obtain write access.
- **Service** option
  Provides read and write access to Service parameters.

Enter access code

Navigation System → User manag. → Ent. access code

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

User entry 0 to 9 999

Reset Maintenance code

Navigation System → User manag. → Reset Maint code

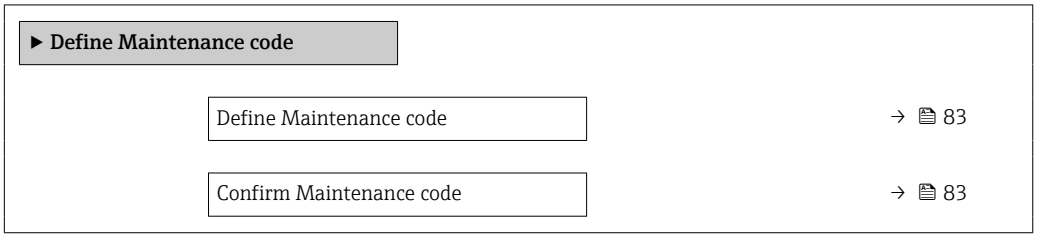
Description Enter the code provided by Endress+Hauser Technical Support to reset the Maintenance code.

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

6.2.1 "Define access code" wizard

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

Navigation System → User manag. → Def. access code



Define Maintenance code

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

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

User entry 0 to 9 999

Confirm Maintenance code

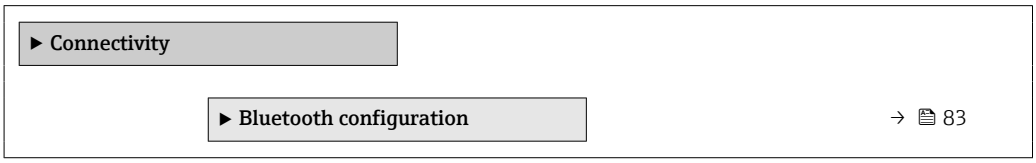
Navigation System → User manag. → Def. Maint. code → Conf. Maint code

Description Confirm the access code entered for the Maintenance role.

User entry 0 to 9 999

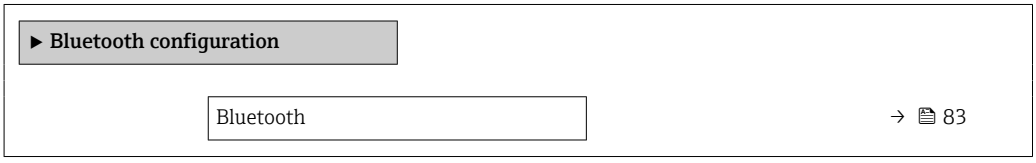
6.3 "Connectivity" submenu

Navigation System → Connectivity



6.3.1 "Bluetooth configuration" submenu

Navigation System → Connectivity → Bluetooth conf.



Bluetooth

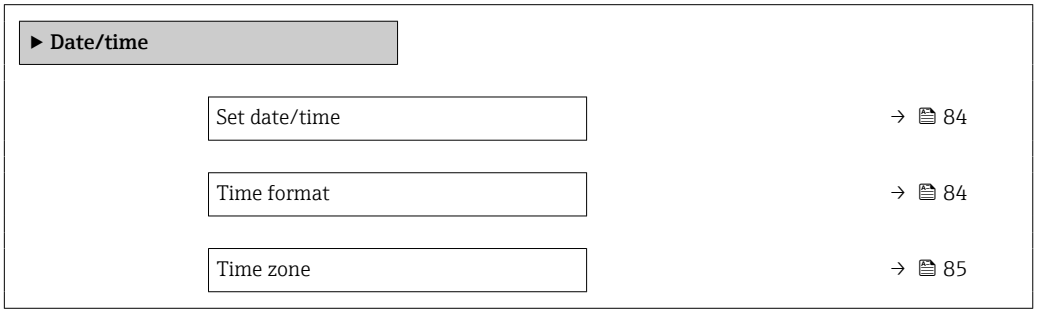
Navigation System → Connectivity → Bluetooth conf. → Bluetooth

Description Enable or disable Bluetooth.

Selection
- Enable
- On touch
- Not available *

6.4 "Date/time" submenu

Navigation System → Date/time



Set date/time

Navigation System → Date/time → Set date/time

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

User entry Positive integer

Time format

Navigation System → Date/time → Time format

Description Select time format.

Selection
- 24 h
- 12 h AM/PM

* Visibility depends on order options or device settings

Time zone

Navigation System → Date/time → Time zone

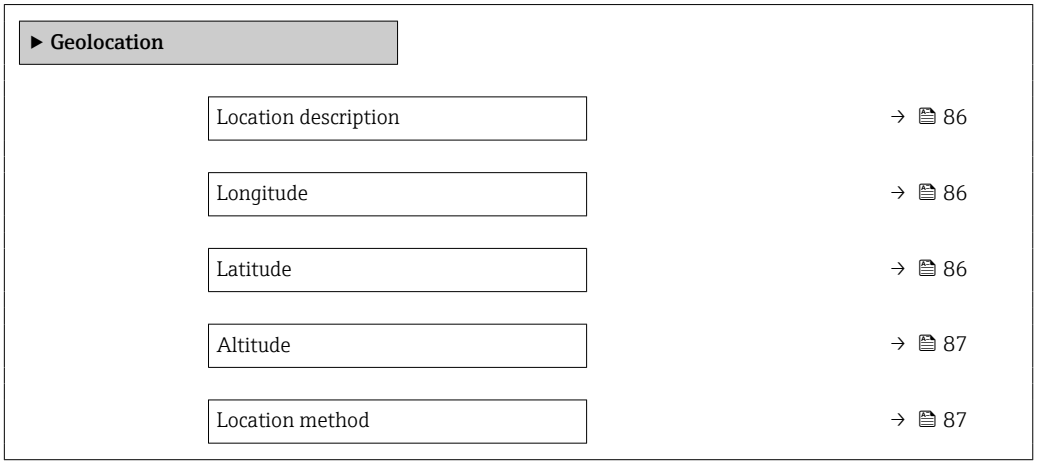
Description Select the time zone. Every time the time zone is changed, a logbook entry is created.

Selection

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

6.5 "Geolocation" submenu

Navigation System → Geolocation



Location description

Navigation System → Geolocation → Location descr.

Description Enter a description for the location

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

Longitude

Navigation System → Geolocation → Longitude

Description Enter the longitude.

User entry −180 to 180 °

Latitude

Navigation System → Geolocation → Latitude

Description Enter latitude

User entry −90 to 90 °

Altitude

Navigation System → Geolocation → Altitude

Description Enter altitude

User entry Signed floating-point number

Location method

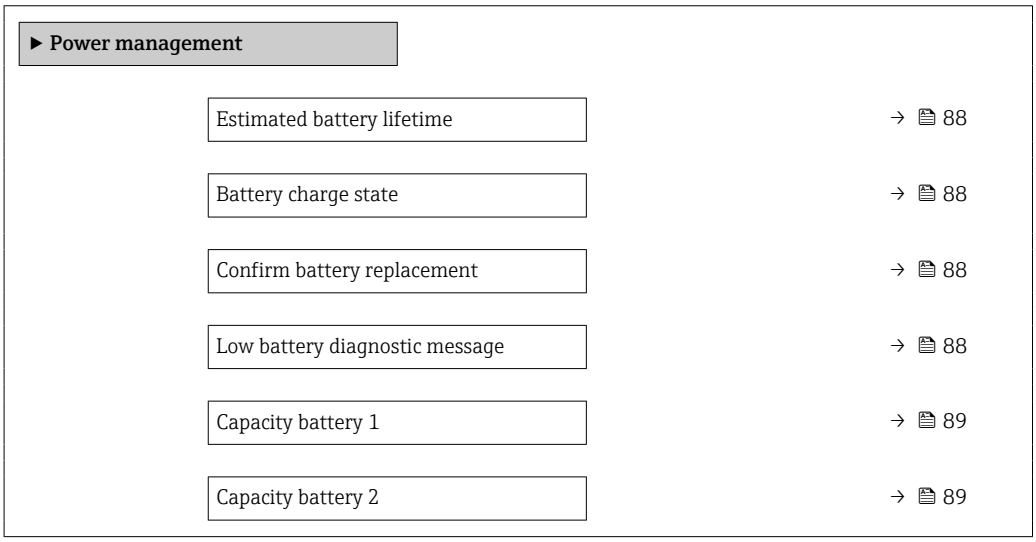
Navigation System → Geolocation → Location method

Description Select the location method.

Selection
- No fix
- GPS or Standard Positioning Service fix
- Differential GPS fix
- Precise positioning service (PPS) fix
- Real Time Kinetic (RTK) fixed solution
- Real Time Kinetic (RTK) float solution
- Estimated dead reckoning
- Manual input mode
- Simulation Mode

6.6 "Power management" submenu

Navigation System → Power management



Estimated battery lifetime

Navigation System → Power management → EstBattLifetime

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 → Power management → BattChargeState

Description Shows the charge state of the batteries.

User interface 0 to 100 %

Confirm battery replacement

Navigation System → Power management → Conf. replacem.

Description Confirm battery replacement by selecting the appropriate battery.

Selection
- Cancel
- Battery 1
- Battery 2 *

Low battery diagnostic message

Navigation System → Power management → 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

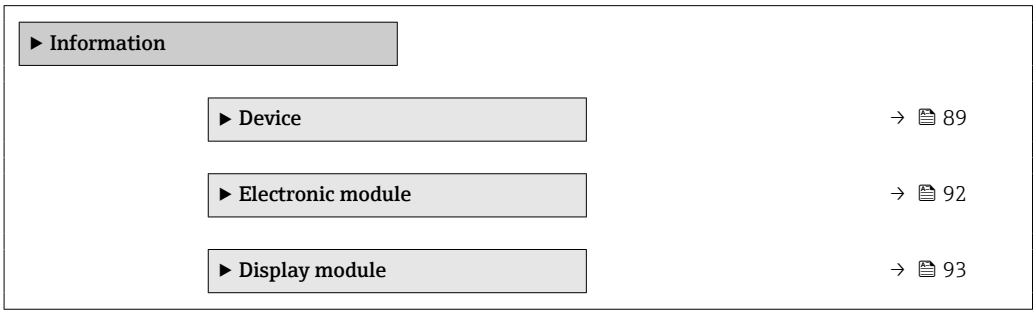
* Visibility depends on order options or device settings

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

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

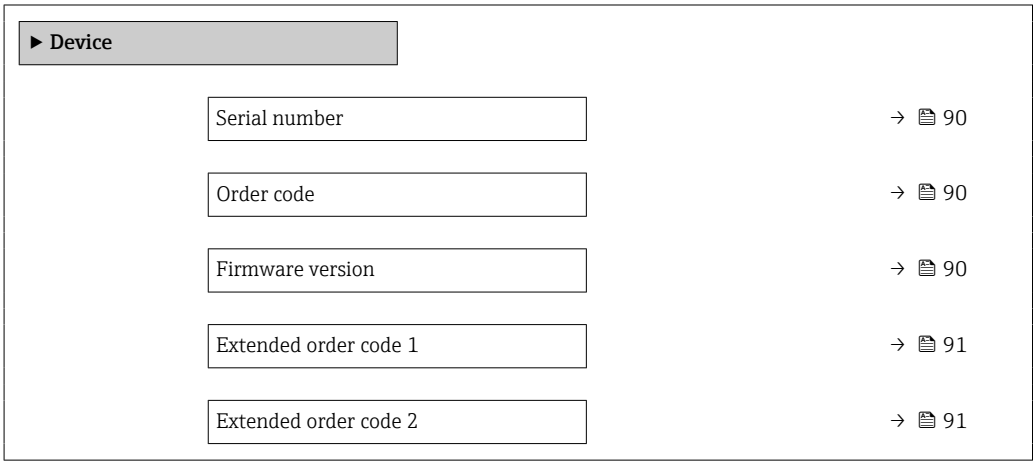
6.7 "Information" submenu

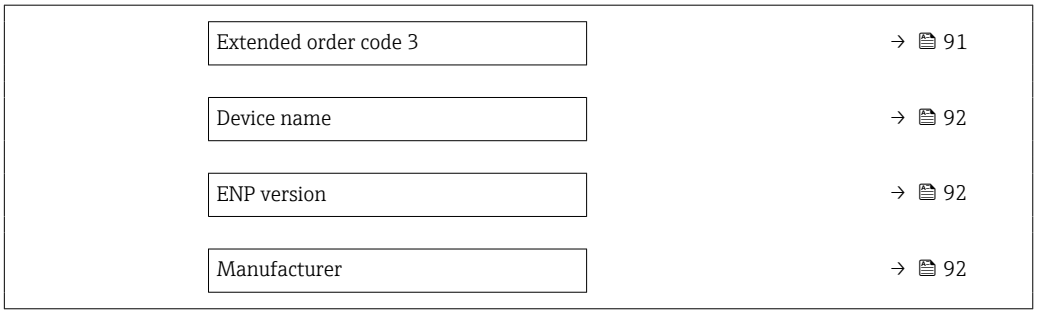
Navigation System → Information



6.7.1 "Device" submenu

Navigation System → Information → Device





Serial number

Navigation System → Information → Device → Serial number

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

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

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

Order code

Navigation System → Information → Device → Order code

Description Displays the device order code.

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

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

Firmware version

Navigation System → Information → Device → Firmware version

Description Displays the device firmware version installed.

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

Extended order code 1

Navigation System → Information → Device → Ext. order cd. 1

Description 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)

Extended order code 2

Navigation System → Information → Device → 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.

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

Navigation 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 → Information → Device → Device name

Description Displays the name of the transmitter.

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

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

ENP version

Navigation System → Information → Device → ENP version

Description Displays the version of the electronic nameplate (ENP).

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

Manufacturer

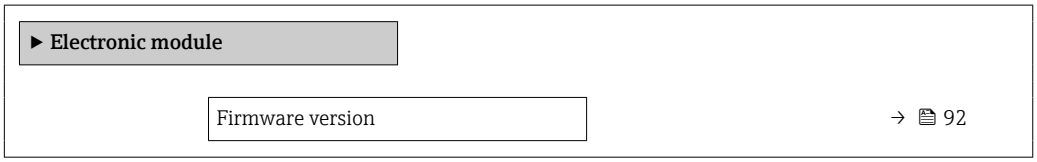
Navigation System → Information → Device → Manufacturer

Description Displays the manufacturer.

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

6.7.2 "Electronic module" submenu

Navigation System → Information → Electr. module



Firmware version

Navigation System → Information → Electr. module → Firmware version

Description Displays the firmware version of the module.

User interface Positive integer

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

Bootloader revision

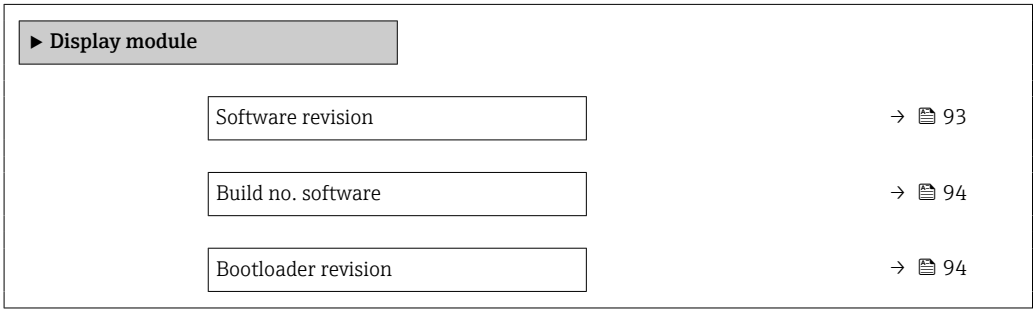
Navigation System → Information → Electr. module → Bootloader rev.

Description Displays the bootloader revision of the module firmware.

User interface Positive integer

6.7.3 "Display module" submenu

Navigation System → Information → Display module



Firmware version

Navigation System → Information → Display module → Firmware version

Description Displays the firmware version of the module.

User interface Positive integer

Build no. software

Navigation System → Information → Display module → Build no. softw.

Description Displays the build number of the module firmware.

User interface 0 to 65 535

Bootloader revision

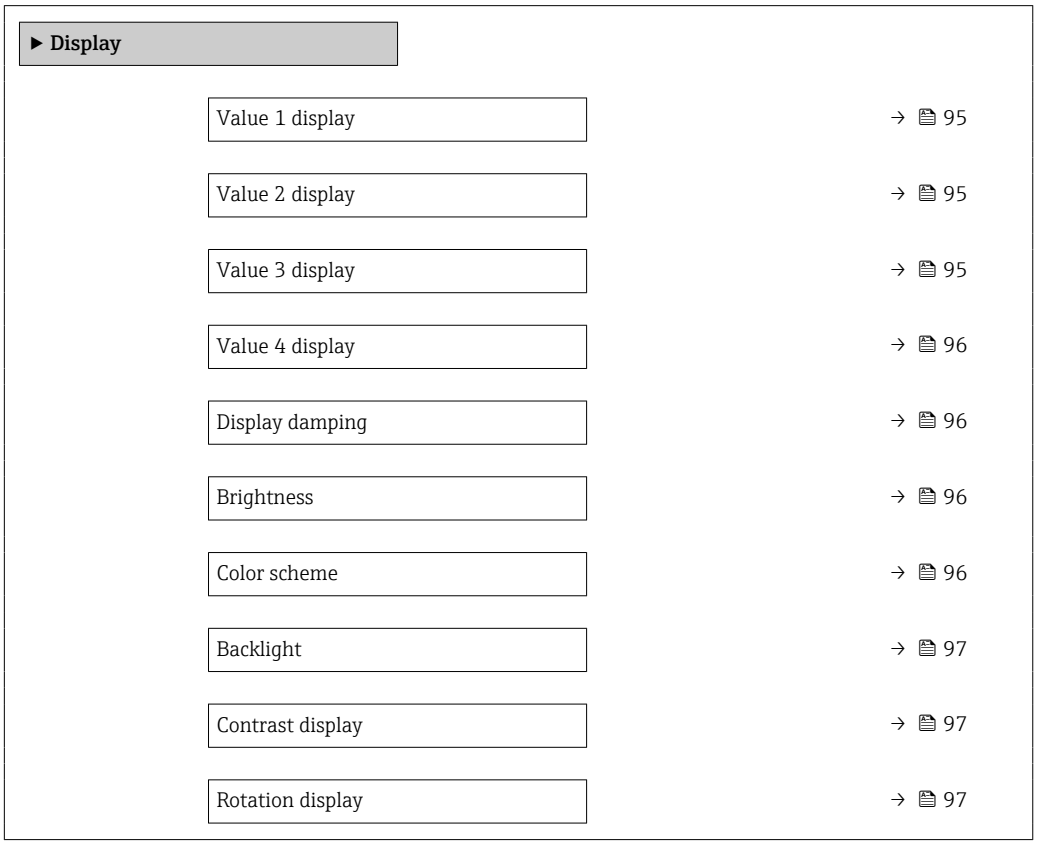
Navigation System → Information → Display module → Bootloader rev.

Description Displays the bootloader revision of the module firmware.

User interface Positive integer

6.8 "Display" submenu

Navigation System → Display



Value 1 display

Navigation System → Display → Value 1 display

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

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

Selection
- Volume flow
- Conductivity *
- Pressure *
- Totalizer 1
- Totalizer 2
- Totalizer 3

Value 2 display

Navigation System → Display → Value 2 display

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

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

Selection
- None
- Volume flow
- Conductivity *
- Pressure *
- Totalizer 1
- Totalizer 2
- Totalizer 3

Value 3 display

Navigation System → Display → Value 3 display

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

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

Selection
- None
- Volume flow
- Conductivity *
- Pressure *
- Totalizer 1
- Totalizer 2
- Totalizer 3

* Visibility depends on order options or device settings

Value 4 display

Navigation System → Display → Value 4 display

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

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

Selection
- None
- Volume flow
- Conductivity *
- Pressure *
- Totalizer 1
- Totalizer 2
- Totalizer 3

Display damping

Navigation System → Display → Display damping

Description Enter time constant (PT1 element) to set reaction time of the display to fluctuations in the measured value.

Additional information:
- The smaller the time constant the faster the display reacts to fluctuations in the measured value.
- If the time constant is set to 0, damping is deactivated.

User entry 0.0 to 999.9 s

Brightness

Navigation System → Display → Brightness

Description Adjust brightness.

User entry 0 to 100 %

Color scheme

Navigation System → Display → Color scheme

Description Select preferred color scheme.

* Visibility depends on order options or device settings

Selection
- Light
- Dark

Backlight

Navigation System → Display → Backlight

Description Switch the local display backlight on / off.

Selection
- Disable
- Enable

Contrast display

Navigation System → Display → Contrast display

Description Adjust local display contrast setting to ambient conditions (e.g. lighting or reading angle).

User entry 20 to 80 %

Rotation display

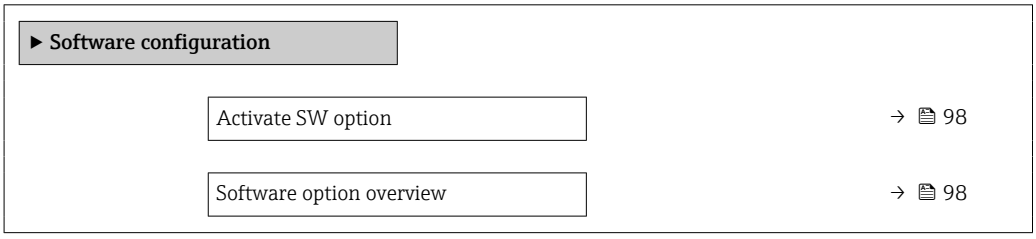
Navigation System → Display → Rotation display

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

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

6.9 "Software configuration" submenu

Navigation System → Software config.



Activate SW option

Navigation System → Software config. → Activate SW opt.

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

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

NOTE
If an an invalid code is entered the software options that have already been activated are invalidated!
Before entering a new activation code: Create a record of the existing activation code.

User entry Positive integer

Software option overview

Navigation System → Software config. → SW option overv.

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

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

User interface
- Extended data logger
- Heartbeat Verification
- Custody transfer
- Heartbeat Monitoring

7 Modbus RS485 Register Information

7.1 Notes

7.1.1 Structure of the register information

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

Navigation: navigation path to the parameter					
Parameter	**Register**	**Data type**	**Access type**	**Selection/input**	**→**
Name of parameter	Indicated in decimal numerical format	▪ Float length = 4 byte ▪ Integer length = 2 byte ▪ String length, depending on parameter	Possible type of access to parameter: ▪ Read access via function codes 03, 04 or 23 ▪ Write access via function codes 06, 16 or 23	**Options** List of the individual options for the parameter ▪ Option 1 ▪ **Option 2** ▪ **Option 3** (+) ▪ Factory setting highlighted in bold ▪ (+) = Factory setting depends on country, order options or device settings **User entry** Input range for the parameter	Page number information and cross-reference to the standard parameter description

NOTICE

If non-volatile device parameters are modified via the MODBUS RS485 function codes 06, 16 or 23, the change is saved in the EEPROM of the measuring device.

The number of writes to the EEPROM is technically restricted to a maximum of 1 million.

- ▶ Make sure to comply with this limit since, if it is exceeded, data loss and measuring device failure will result.
- ▶ Avoid constantly writing non-volatile device parameters via the MODBUS RS485.

7.1.2 Address model

The Modbus RS485 register addresses of the measuring device are implemented in accordance with the "Modbus Applications Protocol Specification V1.1".

In addition, systems are used that work with the register address model "Modicon Modbus Protocol Reference Guide (PI-MBUS-300 Rev. J)".

Depending on the function code used, a number is added at the start of the register address with this specification:

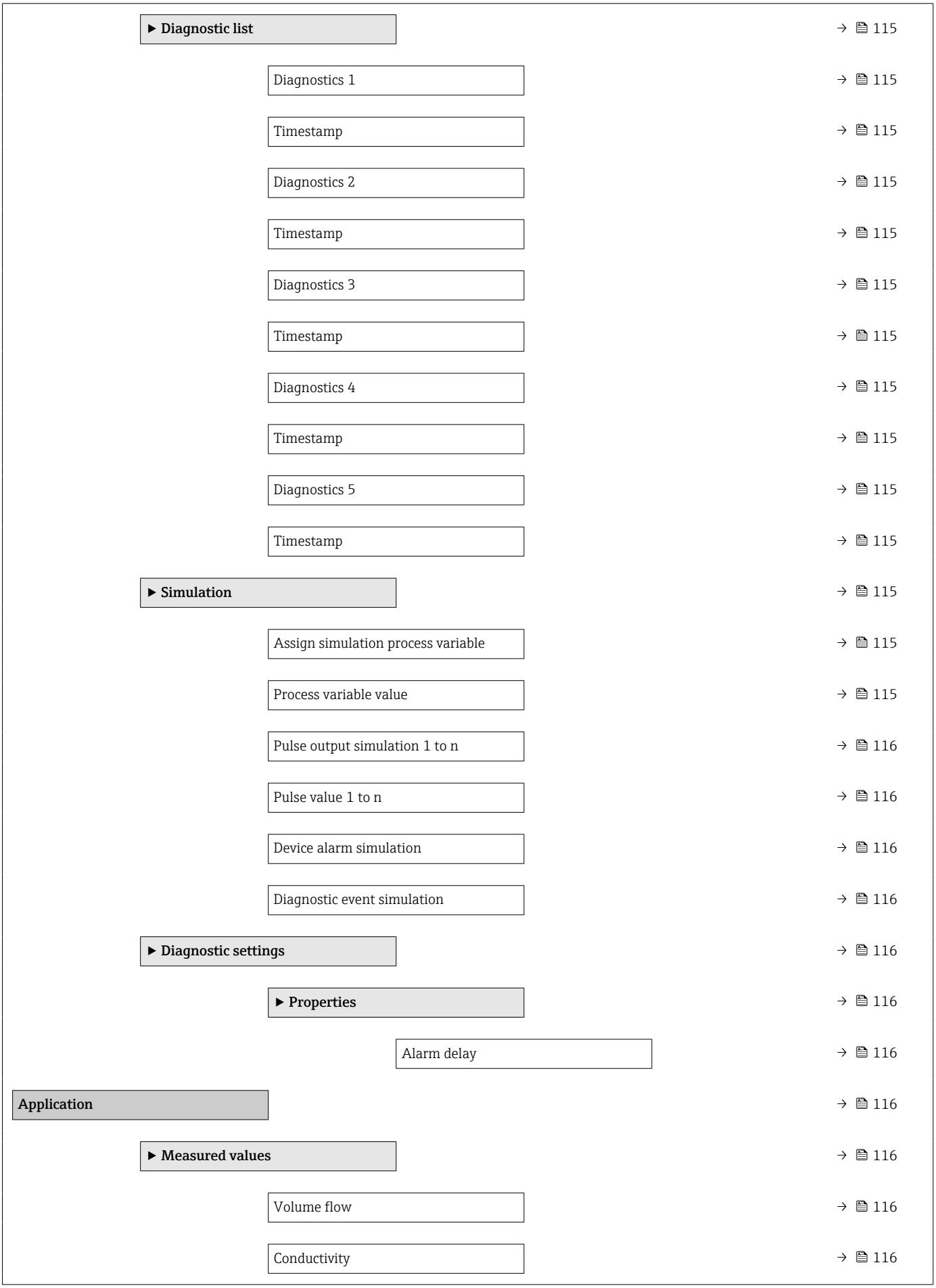
- "3" → "Read" access
- "4" → "Write" access

Function code	Access type	Register in accordance with "Modbus Applications Protocol Specification"	Register in accordance with "Modicon Modbus Protocol Reference Guide"
03 04 23	Read	XXXX Example: mass flow = 2007	3XXXX Example: mass flow = 32007
06 16 23	Write	XXXX Example: reset totalizer = 6401	4XXXX Example: reset totalizer = 46401

7.2 Overview of the operating menu

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

	Operating mode	→ 113
	Assign pulse output 1 to n	→ 113
	Pulse width	→ 113
	Value per pulse	→ 113
	Switch output function	→ 113
	Assign diagnostic behavior	→ 113
	Assign limit	→ 114
	Switch-on value	→ 114
	Switch-off value	→ 114
	Assign status	→ 114
	Failure mode	→ 114
	Value 1 display	→ 114
	Value 2 display	→ 114
	Value 3 display	→ 114
	Value 4 display	→ 114
	Display damping	→ 114
▶ **Import / Export**		→ 115
Diagnostics		→ 115
▶ **Active diagnostics**		→ 115
	Actual diagnostics	→ 115
	Timestamp	→ 115
	Previous diagnostics	→ 115
	Timestamp	→ 115
	Operating time from restart	→ 115
	Operating time	→ 115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Assign simulation process variable → 115
Process variable value → 115
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▶ Measured values → 116
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- Flow velocity → 116
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- ▶ **Totalizer** → 116
  - Totalizer value 1 to n → 116
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- ▶ **System units** → 117
  - Volume flow unit → 117
  - Volume unit → 118
  - Conductivity unit → 118
  - Temperature unit → 119
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- ▶ **Totalizers** → 119
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    - Reset all totalizers → 119
  - ▶ **Totalizer 1 to n** → 119
    - Assign process variable → 119
    - Unit totalizer 1 to n → 119
    - Totalizer operation mode → 119
    - Control Totalizer 1 to n → 120
    - Preset value 1 to n → 120
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- ▶ **Sensor** → 120
  - ▶ **Process parameters** → 120
    - Flow damping → 120
    - Flow damping time → 120

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Conductivity measurement	→ 120
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▶ **Low flow cut off**	→ 120
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Factor pressure measuring interval	→ 121
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Assign status input	→ 121
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Assign diagnostic behavior	→ 122
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- ▶ **Communication** → 123
  - ▶ **Modbus configuration** → 123
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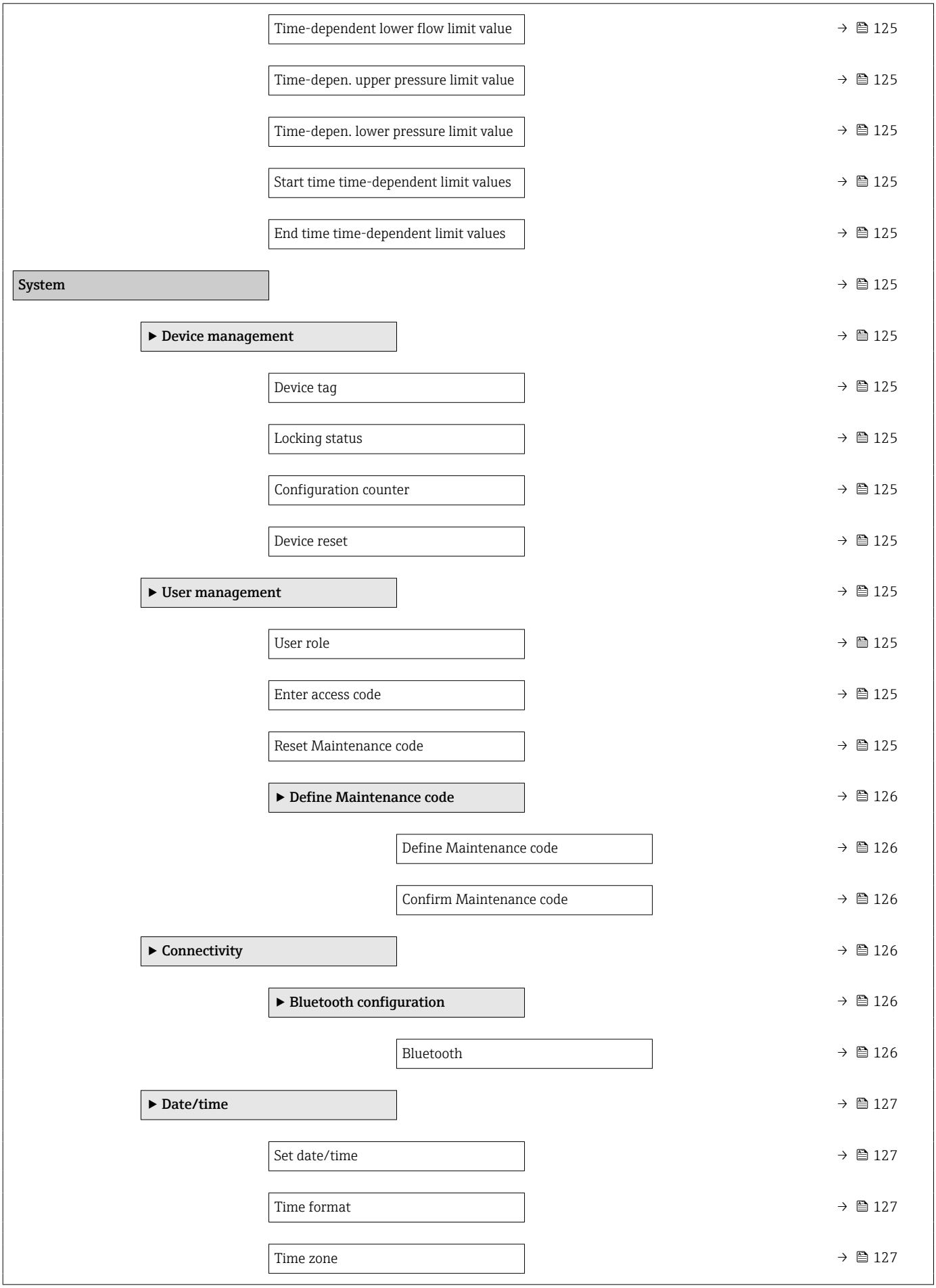
    - Baudrate → 123
    - Parity → 123
    - Byte order → 123
    - Telegram delay → 123
    - Failure mode → 123
    - Fieldbus writing access → 123
  - ▶ **Modbus data map** → 124
    - Scan list register 0 to 15 → 124
  - ▶ **Modbus information** → 124
    - Device ID → 124
    - Device revision → 124
- ▶ **Data logging** → 124
  - Log interval → 124
  - Reference time log interval → 124
- ▶ **Measured value supervision** → 124
  - Upper flow limit value → 124
  - Lower flow limit value → 124
  - Upper pressure limit value → 124
  - Lower pressure limit value → 124
  - Time-dependent upper flow limit value → 125


Time-dependent lower flow limit value → 125
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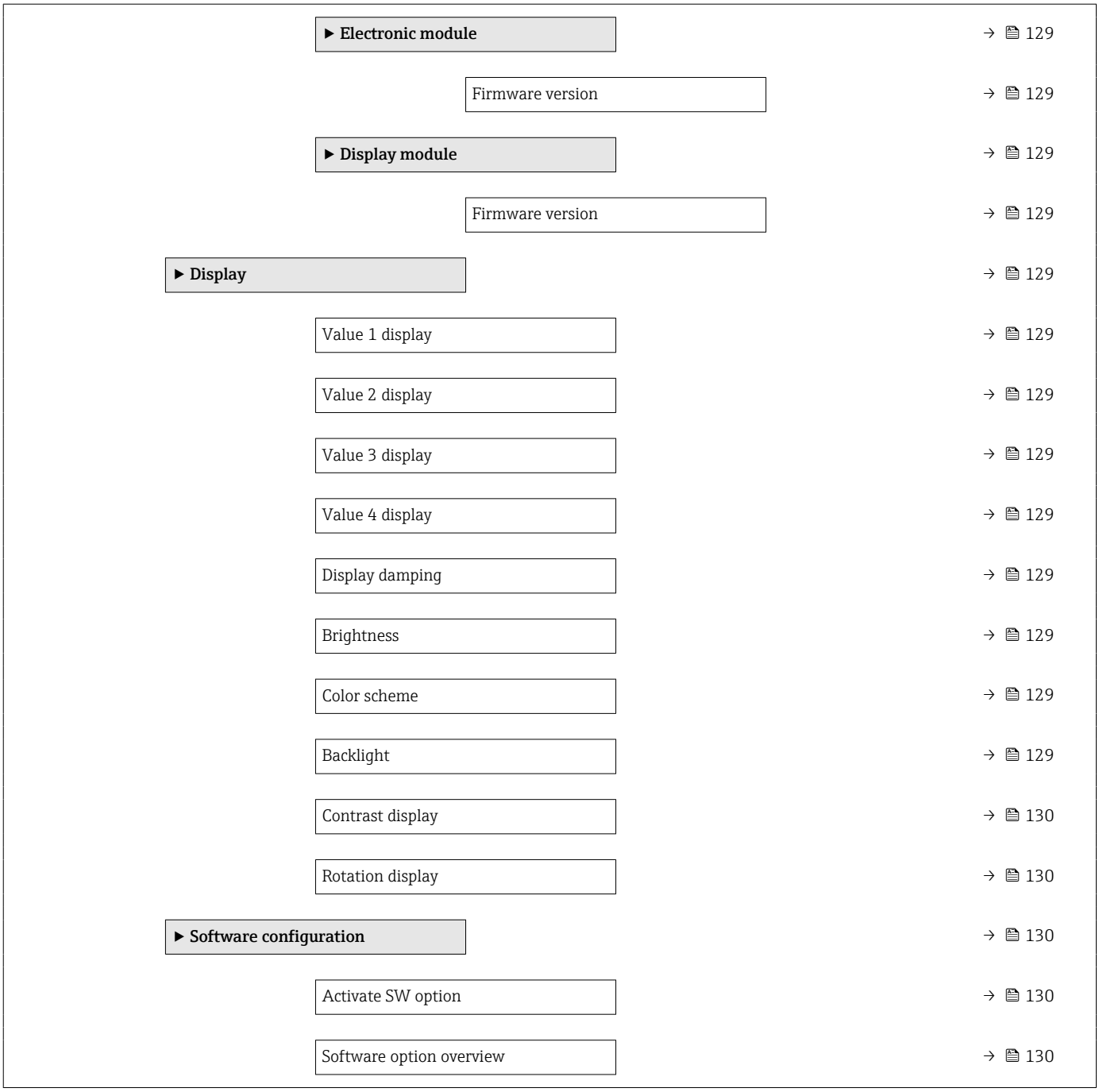

7.3 Register information

7.3.1 "Guidance" menu

"Commissioning" wizard

Navigation: Guidance → Commissioning					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Device tag	2026 to 2041	String	Read / Write	Character string comprising numbers, letters and special characters (#32)	7
Serial number	7003 to 7008	String	Read	Character string comprising numbers, letters and special characters (#11)	8

Navigation: Guidance → Commissioning					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Firmware version	7277 to 7280	String	Read	Character string comprising numbers, letters and special characters (#8)	8
Device name	7263 to 7270	String	Read	Character string comprising numbers, letters and special characters (#16)	8

Navigation: Guidance → Commissioning					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Volume flow unit	2103	Integer	Read / Write	0 = cm^3/s 1 = cm^3/min 2 = cm^3/h 3 = cm^3/d 4 = dm^3/s 5 = dm^3/min 6 = dm^3/h 7 = dm^3/d 8 = m^3/s 9 = m^3/min 10 = m^3/h 11 = m^3/d 12 = ml/s 13 = ml/min 14 = ml/h 15 = ml/d 16 = l/s 17 = l/min 18 = l/h 19 = l/d 20 = hl/s 21 = hl/min 22 = hl/h 23 = hl/d 24 = Ml/s 25 = Ml/min 26 = Ml/h 27 = Ml/d 32 = af/s 33 = af/min 34 = af/h 35 = af/d 36 = ft^3/s 37 = ft^3/min 38 = ft^3/h 39 = ft^3/d 40 = fl oz/s (us) 41 = fl oz/min (us) 42 = fl oz/h (us) 43 = fl oz/d (us) 44 = gal/s (us) 45 = gal/min (us) 46 = gal/h (us) 47 = gal/d (us) 48 = Mgal/s (us) 49 = Mgal/min (us) 50 = Mgal/h (us) 51 = Mgal/d (us) 52 = bbl/s (us;liq.) 53 = bbl/min (us;liq.) 54 = bbl/h (us;liq.) 55 = bbl/d (us;liq.) 56 = bbl/s (us;beer) 57 = bbl/min (us;beer) 58 = bbl/h (us;beer) 59 = bbl/d (us;beer) 60 = bbl/s (us;oil) 61 = bbl/min (us;oil) 62 = bbl/h (us;oil) 63 = bbl/d (us;oil) 64 = bbl/s (us;tank) 65 = bbl/min (us;tank) 66 = bbl/h (us;tank) 67 = bbl/d (us;tank) 68 = gal/s (imp) 69 = gal/min (imp) 70 = gal/h (imp)	8

Navigation: Guidance → Commissioning					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
				71 = gal/d (imp) 72 = Mgal/s (imp) 73 = Mgal/min (imp) 74 = Mgal/h (imp) 75 = Mgal/d (imp) 76 = bbl/s (imp;beer) 77 = bbl/min (imp;beer) 78 = bbl/h (imp;beer) 79 = bbl/d (imp;beer) 80 = bbl/s (imp;oil) 81 = bbl/min (imp;oil) 82 = bbl/h (imp;oil) 83 = bbl/d (imp;oil) 88 = kgal/s (us) 89 = kgal/min (us) 90 = kgal/h (us) 91 = kgal/d (us) 92 = MMft³/s 93 = MMft³/min 94 = MMft³/h 96 = Mft³/d	
Volume unit	2104	Integer	Read / Write	0 = cm³ 1 = dm³ 2 = m³ 3 = ml 4 = l 5 = hl 6 = Ml Mega 8 = af 9 = ft³ 10 = fl oz (us) 11 = gal (us) 12 = Mgal (us) 13 = bbl (us;liq.) 14 = bbl (us;beer) 15 = bbl (us;oil) 16 = bbl (us;tank) 17 = gal (imp) 18 = Mgal (imp) 19 = bbl (imp;beer) 20 = bbl (imp;oil) 22 = kgal (us) 23 = Mft³	9
Temperature unit	2109	Integer	Read / Write	0 = °C 1 = K 2 = °F 3 = °R	10
Pressure unit	2130	Integer	Read / Write	0 = bar 1 = psi a 2 = bar g 3 = psi g 4 = Pa a 5 = kPa a 6 = MPa a 7 = Pa g 8 = kPa g 9 = MPa g	10
Assign process variable	2601	Integer	Read / Write	0 = Off 1 = Volume flow	10

Navigation: Guidance → Commissioning					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Unit totalizer 1 to n	1: 4604 2: 4605 3: 4606	Integer	Read / Write	0 = cm^3 * 1 = dm^3 * 2 = m^3 * 3 = ml * 4 = l * 5 = hl * 6 = Ml Mega * 8 = af * 9 = ft^3 * 10 = fl oz (us) * 11 = gal (us) * 12 = Mgal (us) * 13 = bbl (us;liq.) * 14 = bbl (us;beer) * 15 = bbl (us;oil) * 16 = bbl (us;tank) * 17 = gal (imp) * 18 = Mgal (imp) * 19 = bbl (imp;beer) * 20 = bbl (imp;oil) * 22 = kgal (us) * 23 = Mft^3 * 251 = None *	11
Totalizer operation mode	2605	Integer	Read / Write	0 = Net flow total 1 = Forward flow total 2 = Reverse flow total	11
Failure mode	2606	Integer	Read / Write	0 = Stop 1 = Actual value 2 = Last valid value	12
Low flow cut off	5101	Integer	Read / Write	0 = Off 1 = Volume flow	12
On value low flow cutoff	5138 to 5139	Float	Read / Write	Positive floating-point number	13
Off value low flow cutoff	5104 to 5105	Float	Read / Write	0 to 100.0 %	13
Empty pipe detection	5106	Integer	Read / Write	0 = Off 1 = On	13
Operating mode	4479	Integer	Read / Write	0 = Pulse 1 = Switch	13
Assign pulse output 1 to n	1: 2461 2: 2462 3: 4685	Integer	Read / Write	0 = Off 1 = Volume flow	14
Pulse width	2836 to 2837	Float	Read / Write	0.1 to 500 ms	14
Value per pulse	3034 to 3035	Float	Read / Write	Signed floating-point number	15
Switch output function	3022	Integer	Read / Write	0 = Off 1 = On 2 = Diagnostic behavior 3 = Flow direction check 4 = Limit 5 = Status	15
Assign diagnostic behavior	3096	Integer	Read / Write	0 = Alarm 1 = Warning 2 = Alarm or warning	16

Navigation: Guidance → Commissioning					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Assign limit	3184	Integer	Read / Write	0 = Off 1 = Volume flow 4 = Conductivity * 7 = Temperature * 10 = Battery state of charge 16 = Totalizer 1 17 = Totalizer 2 18 = Totalizer 3 37 = Flow velocity 66 = Pressure *	16
Switch-on value	3242 to 3243	Float	Read / Write	Signed floating-point number	16
Switch-off value	3234 to 3235	Float	Read / Write	Signed floating-point number	17
Assign status	3374	Integer	Read / Write	0 = Low flow cut off 1 = Empty pipe detection	17
Failure mode	3384	Integer	Read / Write	0 = Actual status 1 = Open 6 = Closed	17
Value 1 display	34918	Integer	Read / Write	1 = Volume flow 4 = Conductivity * 7 = Temperature 16 = Totalizer 1 17 = Totalizer 2 18 = Totalizer 3 66 = Pressure *	18
Value 2 display	34919	Integer	Read / Write	1 = Volume flow 4 = Conductivity * 7 = Temperature 16 = Totalizer 1 17 = Totalizer 2 18 = Totalizer 3 66 = Pressure * 251 = None	18
Value 3 display	34922	Integer	Read / Write	1 = Volume flow 4 = Conductivity * 7 = Temperature 16 = Totalizer 1 17 = Totalizer 2 18 = Totalizer 3 66 = Pressure * 251 = None	18
Value 4 display	34923	Integer	Read / Write	1 = Volume flow 4 = Conductivity * 7 = Temperature 16 = Totalizer 1 17 = Totalizer 2 18 = Totalizer 3 66 = Pressure * 251 = None	19
Display damping	27602 to 27603	Float	Read / Write	0.0 to 999.9 s	12

* Visibility depends on order options or device settings

"Import / Export" submenu

7.3.2 "Diagnostics" menu

"Active diagnostics" submenu

Navigation: Diagnostics → Active diagnostics					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Actual diagnostics	2732	Integer	Read	Positive integer	21
Timestamp	29726	Integer	Read	Days (d), hours (h), minutes (m), seconds (s)	22
Previous diagnostics	2734	Integer	Read	Positive integer	22
Timestamp	29715	Integer	Read	Days (d), hours (h), minutes (m), seconds (s)	22
Operating time from restart	2624	Integer	Read	Days (d), hours (h), minutes (m), seconds (s)	22
Operating time	2631	Integer	Read	Days (d), hours (h), minutes (m), seconds (s)	22

"Diagnostic list" submenu

Navigation: Diagnostics → Diagnostic list					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Diagnostics 1	2736	Integer	Read	Positive integer	23
Timestamp	29704	Integer	Read	Days (d), hours (h), minutes (m), seconds (s)	23
Diagnostics 2	2738	Integer	Read	Positive integer	24
Timestamp	29693	Integer	Read	Days (d), hours (h), minutes (m), seconds (s)	24
Diagnostics 3	2740	Integer	Read	Positive integer	24
Timestamp	29682	Integer	Read	Days (d), hours (h), minutes (m), seconds (s)	24
Diagnostics 4	2742	Integer	Read	Positive integer	24
Timestamp	29671	Integer	Read	Days (d), hours (h), minutes (m), seconds (s)	25
Diagnostics 5	2744	Integer	Read	Positive integer	25
Timestamp	29489	Integer	Read	Days (d), hours (h), minutes (m), seconds (s)	25

"Simulation" submenu

Navigation: Diagnostics → Simulation					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Assign simulation process variable	6813	Integer	Read / Write	0 = Off 1 = Volume flow 4 = Conductivity * 7 = Temperature * 37 = Flow velocity 66 = Pressure	26
Process variable value	6814 to 6815	Float	Read / Write	Signed floating-point number	26

Navigation: Diagnostics → Simulation					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Pulse output simulation 1 to n	1: 6215 2: 6216 3: 6217	Integer	Read / Write	0 = Off 1 = Down-counting value 2 = Fixed value	26
Pulse value 1 to n	1: 6219 2: 6220 3: 6221	Integer	Read / Write	0 to 65 535	27
Device alarm simulation	6812	Integer	Read / Write	0 = Off 1 = On	27
Diagnostic event simulation	4259	Integer	Read / Write	0 = Off	28

* Visibility depends on order options or device settings

"Diagnostic settings" submenu

"Properties" submenu

Navigation: Diagnostics → Diagnostic settings → Properties					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Alarm delay	6808 to 6809	Float	Read / Write	0 to 60 s	28

7.3.3 "Application" menu

"Measured values" submenu

Navigation: Application → Measured values					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Volume flow	2009 to 2010	Float	Read	Signed floating-point number	41
Conductivity	2099 to 2100	Float	Read	Positive floating-point number	41
Flow velocity	5085 to 5086	Float	Read	Signed floating-point number	41
Pressure	5087 to 5088	Float	Read	Signed floating-point number	41

"Totalizer" submenu

Navigation: Application → Measured values → Totalizer					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Totalizer value 1 to n	1: 2610 to 2611 2: 2810 to 2811 3: 3010 to 3011	Float	Read	Signed floating-point number	42
Totalizer overflow 1 to n	1: 2612 to 2613 2: 2812 to 2813 3: 3012 to 3013	Float	Read	−32 000.0 to 32 000.0	42

"System units" submenu

Navigation: Application → System units					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Volume flow unit	2103	Integer	Read / Write	0 = cm^3/s 1 = cm^3/min 2 = cm^3/h 3 = cm^3/d 4 = dm^3/s 5 = dm^3/min 6 = dm^3/h 7 = dm^3/d 8 = m^3/s 9 = m^3/min 10 = m^3/h 11 = m^3/d 12 = ml/s 13 = ml/min 14 = ml/h 15 = ml/d 16 = l/s 17 = l/min 18 = l/h 19 = l/d 20 = hl/s 21 = hl/min 22 = hl/h 23 = hl/d 24 = Ml/s 25 = Ml/min 26 = Ml/h 27 = Ml/d 32 = af/s 33 = af/min 34 = af/h 35 = af/d 36 = ft^3/s 37 = ft^3/min 38 = ft^3/h 39 = ft^3/d 40 = fl oz/s (us) 41 = fl oz/min (us) 42 = fl oz/h (us) 43 = fl oz/d (us) 44 = gal/s (us) 45 = gal/min (us) 46 = gal/h (us) 47 = gal/d (us) 48 = Mgal/s (us) 49 = Mgal/min (us) 50 = Mgal/h (us) 51 = Mgal/d (us) 52 = bbl/s (us;liq.) 53 = bbl/min (us;liq.) 54 = bbl/h (us;liq.) 55 = bbl/d (us;liq.) 56 = bbl/s (us;beer) 57 = bbl/min (us;beer) 58 = bbl/h (us;beer) 59 = bbl/d (us;beer) 60 = bbl/s (us;oil) 61 = bbl/min (us;oil) 62 = bbl/h (us;oil) 63 = bbl/d (us;oil) 64 = bbl/s (us;tank) 65 = bbl/min (us;tank) 66 = bbl/h (us;tank) 67 = bbl/d (us;tank) 68 = gal/s (imp)	43

Navigation: Application → System units					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
				69 = gal/min (imp) 70 = gal/h (imp) 71 = gal/d (imp) 72 = Mgal/s (imp) 73 = Mgal/min (imp) 74 = Mgal/h (imp) 75 = Mgal/d (imp) 76 = bbl/s (imp;beer) 77 = bbl/min (imp;beer) 78 = bbl/h (imp;beer) 79 = bbl/d (imp;beer) 80 = bbl/s (imp;oil) 81 = bbl/min (imp;oil) 82 = bbl/h (imp;oil) 83 = bbl/d (imp;oil) 88 = kgal/s (us) 89 = kgal/min (us) 90 = kgal/h (us) 91 = kgal/d (us) 92 = MMft³/s 93 = MMft³/min 94 = MMft³/h 96 = Mft³/d	
Volume unit	2104	Integer	Read / Write	0 = cm³ 1 = dm³ 2 = m³ 3 = ml 4 = l 5 = hl 6 = Ml Mega 8 = af 9 = ft³ 10 = fl oz (us) 11 = gal (us) 12 = Mgal (us) 13 = bbl (us;liq.) 14 = bbl (us;beer) 15 = bbl (us;oil) 16 = bbl (us;tank) 17 = gal (imp) 18 = Mgal (imp) 19 = bbl (imp;beer) 20 = bbl (imp;oil) 22 = kgal (us) 23 = Mft³	44
Conductivity unit	2121	Integer	Read / Write	1 = MS/m 2 = kS/m 3 = S/m 4 = S/cm 5 = mS/m 6 = mS/cm 7 = µS/m 8 = µS/cm 9 = µS/mm 10 = nS/cm	45

Navigation: Application → System units					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Temperature unit	2109	Integer	Read / Write	0 = °C 1 = K 2 = °F 3 = °R	45
Pressure unit	2130	Integer	Read / Write	0 = bar 1 = psi a 2 = bar g 3 = psi g 4 = Pa a 5 = kPa a 6 = MPa a 7 = Pa g 8 = kPa g 9 = MPa g	45

"Totalizers" submenu

"Totalizer handling" submenu

Navigation: Application → Totalizers → Totalizer handling					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Reset all totalizers	2609	Integer	Read / Write	0 = Cancel 1 = Reset + totalize	46

"Totalizer 1 to n" submenu

Navigation: Application → Totalizers → Totalizer 1 to n					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Assign process variable	1: 2601 2: 2801 3: 3001	Integer	Read / Write	0 = Off 1 = Volume flow	47
Unit totalizer 1 to n	1: 4604 2: 4605 3: 4606	Integer	Read / Write	0 = cm³ * 1 = dm³ * 2 = m³ * 3 = ml * 4 = l * 5 = hl * 6 = Ml Mega * 8 = af * 9 = ft³ * 10 = fl oz (us) * 11 = gal (us) * 12 = Mgal (us) * 13 = bbl (us;liq.) * 14 = bbl (us;beer) * 15 = bbl (us;oil) * 16 = bbl (us;tank) * 17 = gal (imp) * 18 = Mgal (imp) * 19 = bbl (imp;beer) * 20 = bbl (imp;oil) * 22 = kgal (us) * 23 = Mft³ * 251 = None *	47
Totalizer operation mode	1: 2605 2: 2805 3: 3005	Integer	Read / Write	0 = Net flow total 1 = Forward flow total 2 = Reverse flow total	48

Navigation: Application → Totalizers → Totalizer 1 to n					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Control Totalizer 1 to n	1: 2608 2: 2808 3: 3008	Integer	Read / Write	0 = Totalize 1 = Reset + totalize 2 = Preset + hold 3 = Reset + hold 5 = Hold	48
Preset value 1 to n	1: 2590 to 2591 2: 2592 to 2593 3: 2594 to 2595	Float	Read / Write	Signed floating-point number	49
Failure mode	1: 2606 2: 2806 3: 3006	Integer	Read / Write	0 = Stop 1 = Actual value 2 = Last valid value	49

* Visibility depends on order options or device settings

"Sensor" submenu

"Process parameters" submenu

Navigation: Application → Sensor → Process parameters					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Flow damping	2274	Integer	Read / Write	0 to 15	51
Flow damping time	35954 to 35955	Float	Read / Write	0 to 99.9 s	51
Flow override	5503	Integer	Read / Write	0 = Off 1 = On	51
Conductivity measurement	2268	Integer	Read / Write	0 = Off 1 = On	52
Conductivity damping time	35969 to 35970	Float	Read / Write	0 to 999.9 s	52

"Low flow cut off" submenu

Navigation: Application → Sensor → Low flow cut off					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Low flow cut off	5101	Integer	Read / Write	0 = Off 1 = Volume flow	53
On value low flow cutoff	5138 to 5139	Float	Read / Write	Positive floating-point number	53
Off value low flow cutoff	5104 to 5105	Float	Read / Write	0 to 100.0 %	53

"Empty pipe detection" submenu

Navigation: Application → Sensor → Empty pipe detection					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Empty pipe detection	5106	Integer	Read / Write	0 = Off 1 = On	54
Switch point empty pipe detection	2890 to 2891	Float	Read / Write	0 to 100 %	54
New adjustment	2335	Integer	Read / Write	0 = Cancel 1 = Empty pipe adjust 2 = Full pipe adjust	54
Progress	2336	Integer	Read	0 = Not ok 6 = Ok 8 = Busy	55

Navigation: Application → Sensor → Empty pipe detection					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Empty pipe adjust value	2181 to 2182	Float	Read	Positive floating-point number	55
Full pipe adjust value	2832 to 2833	Float	Read	Positive floating-point number	55
Measured value EPD	2298 to 2299	Float	Read	Positive floating-point number	55

"Sensor adjustment" submenu

Navigation: Application → Sensor → Sensor adjustment					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Installation direction	5501	Integer	Read / Write	0 = Forward flow 1 = Reverse flow	56
Integration time	2260 to 2261	Float	Read	1 to 65 ms	56
Measuring period	2852 to 2853	Float	Read	0 to 1000 ms	57
Measuring interval mode	9674	Integer	Read / Write	1 = Intelligent adaptation 11 = Fixed value	57
Current measuring interval	26573 to 26574	Float	Read	Positive floating-point number	57
Measuring interval value	26274 to 26275	Float	Read / Write	0 to 60 s	58
Energy budget intelligent adaption	27173	Integer	Read / Write	1 to 100 %	58
Factor pressure measuring interval	32005	Integer	Read / Write	0 to 65 535	58

"Calibration" submenu

Navigation: Application → Sensor → Calibration					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Nominal diameter	2048 to 2057	String	Read	Character string comprising numbers, letters and special characters (#20)	59
Calibration factor	2313 to 2314	Float	Read	Positive floating-point number	59
Zero point	2870 to 2871	Float	Read	Signed floating-point number	59
Conductivity calibration factor	19806 to 19807	Float	Read	0.01 to 10 000	60

"Status input" submenu

Navigation: Application → Status input					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Assign status input	2506	Integer	Read / Write	0 = Off 2 = Reset all totalizers 3 = Reset totalizer 1 4 = Reset totalizer 2 5 = Reset totalizer 3 7 = Generate logbook entry	61
Value status input	2746	Integer	Read	9 = Low 10 = High	62
Response time status input	3404 to 3405	Float	Read / Write	50 to 200 ms	62

"Pulse/switch output 1 to n" submenu

Navigation: Application → Pulse/switch output 1 to n					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Operating mode	1: 4479 2: 4480 3: 9907	Integer	Read / Write	0 = Pulse 1 = Switch	63
Assign pulse output 1 to n	1: 2461 2: 2462 3: 4685	Integer	Read / Write	0 = Off 1 = Volume flow	64
Measuring mode	1: 2394 2: 2395 3: 4683	Integer	Read / Write	0 = Forward flow 1 = Reverse flow 13 = Forward/Reverse flow	64
Switch output function	1: 3022 2: 3023 3: 9914	Integer	Read / Write	0 = Off 1 = On 2 = Diagnostic behavior 3 = Flow direction check 4 = Limit 5 = Status	65
Assign diagnostic behavior	1: 3096 2: 3097 3: 9913	Integer	Read / Write	0 = Alarm 1 = Warning 2 = Alarm or warning	65
Assign limit	1: 3184 2: 3185 3: 4722	Integer	Read / Write	0 = Off 1 = Volume flow 4 = Conductivity * 7 = Temperature * 10 = Battery state of charge 16 = Totalizer 1 17 = Totalizer 2 18 = Totalizer 3 37 = Flow velocity 66 = Pressure *	66
Assign status	1: 3374 2: 3375 3: 4734	Integer	Read / Write	0 = Low flow cut off 1 = Empty pipe detection	66
Value per pulse	1: 3034 to 3035 2: 3036 to 3037 3: 4714 to 4715	Float	Read / Write	Signed floating-point number	66
Pulse width	1: 2836 to 2837 2: 2838 to 2839 3: 4702 to 4703	Float	Read / Write	0.1 to 500 ms	67
Failure mode	1: 2948 2: 2949 3: 4708	Integer	Read / Write	0 = Actual value 1 = No pulses	67
Switch-on value	1: 3242 to 3243 2: 3244 to 3245 3: 4728 to 4729	Float	Read / Write	Signed floating-point number	68
Switch-off value	1: 3234 to 3235 2: 3236 to 3237 3: 4724 to 4725	Float	Read / Write	Signed floating-point number	68
Failure mode	1: 3384 2: 3385 3: 9912	Integer	Read / Write	0 = Actual status 1 = Open 6 = Closed	68

Navigation: Application → Pulse/switch output 1 to n					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Assign flow direction check	1: 3363 2: 3364 3: 4732	Integer	Read / Write	0 = Off 1 = Volume flow	69
Switch state 1 to n	1: 2485 2: 2486 3: 9917	Integer	Read	1 = Open 6 = Closed	69

* Visibility depends on order options or device settings

"Communication" submenu

"Modbus configuration" submenu

Navigation: Application → Communication → Modbus configuration					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Bus address	4910	Integer	Read / Write	1 to 247	70
Baudrate	4912	Integer	Read / Write	0 = 1200 BAUD 1 = 2400 BAUD 2 = 4800 BAUD 3 = 9600 BAUD 4 = 19200 BAUD 5 = 38400 BAUD 6 = 57600 BAUD 7 = 115200 BAUD	70
Parity	4914	Integer	Read / Write	0 = Even 1 = Odd 2 = None / 2 stop bits 3 = None / 1 stop bit	71
Byte order	4915	Integer	Read / Write	0 = 0-1-2-3 1 = 3-2-1-0 2 = 2-3-0-1 3 = 1-0-3-2	71
Telegram delay	4916 to 4917	Float	Read / Write	0 to 100 ms	71
Failure mode	4920	Integer	Read / Write	1 = Last valid value 255 = NaN value	72
Fieldbus writing access	6807	Integer	Read / Write	0 = Read + write 1 = Read only	72

"Modbus data map" submenu

Navigation: Application → Communication → Modbus data map					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Scan list register 0 to 15	0: 5001 1: 5002 2: 5003 3: 5004 4: 5005 5: 5006 6: 5007 7: 5008 8: 5009 9: 5010 10: 5011 11: 5012 12: 5013 13: 5014 14: 5015 15: 5016	Integer	Read / Write	0 to 65 535	73

"Modbus information" submenu

Navigation: Application → Communication → Modbus information					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Device ID	2547	Integer	Read	0 to 65 535	73
Device revision	4481	Integer	Read	0 to 65 535	73

"Data logging" submenu

Navigation: Application → Data logging					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Log interval	35064	Integer	Read / Write	24 = 15 minutes 25 = 15 seconds 26 = 5 minutes 27 = 4 hours 30 = 1 hour 31 = 1 minute 37 = 6 hours 44 = 10 minutes 45 = 10 seconds 46 = 30 minutes 47 = 30 seconds 48 = 12 hours 49 = 24 hours 50 = 2 hours	74
Reference time log interval	27440	Integer	Read / Write	Positive integer	74

"Measured value supervision" submenu

Navigation: Application → Measured value supervision					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Upper flow limit value	31264 to 31265	Float	Read / Write	Signed floating-point number	75
Lower flow limit value	31266 to 31267	Float	Read / Write	Signed floating-point number	75
Upper pressure limit value	31272 to 31273	Float	Read / Write	Positive floating-point number	76
Lower pressure limit value	31274 to 31275	Float	Read / Write	Positive floating-point number	76

Navigation: Application → Measured value supervision					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Time-dependent upper flow limit value	31268 to 31269	Float	Read / Write	Signed floating-point number	76
Time-dependent lower flow limit value	31270 to 31271	Float	Read / Write	Signed floating-point number	76
Time-depen. upper pressure limit value	31276 to 31277	Float	Read / Write	Positive floating-point number	77
Time-depen. lower pressure limit value	31278 to 31279	Float	Read / Write	Positive floating-point number	77
Start time time-dependent limit values	27429	Integer	Read / Write	Positive integer	77
End time time-dependent limit values	27434	Integer	Read / Write	Positive integer	77

7.3.4 "System" menu

"Device management" submenu

Navigation: System → Device management					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Device tag	2026 to 2041	String	Read / Write	Character string comprising numbers, letters and special characters (#32)	79
Locking status	4918	Integer	Read	256 = Hardware locked 512 = Temporarily locked 2048 = CT active - defined parameters 32768 = CT active - all parameters	79
Configuration counter	4818	Integer	Read	0 to 65 535	79
Device reset	6817	Integer	Read / Write	0 = Cancel 1 = Restart device 2 = To delivery settings 5 = Delete powerfail data 21 = Delete T-DAT 22 = Reset faulty parameters 23 = Delete delivery settings 24 = Delete flash file system 25 = Restore S-DAT backup * 30 = Shut down device 35 = Restore T-DAT backup * 36 = Create T-DAT backup	80

* Visibility depends on order options or device settings

"User management" submenu

Navigation: System → User management					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
User role	2178	Integer	Read	0 = Operator 1 = Maintenance 2 = Service 3 = Production 4 = Development	81
Enter access code	2177	Integer	Read / Write	0 to 9 999	82
Reset Maintenance code	8880 to 8895	String	Read / Write	Character string comprising numbers, letters and special characters (#32)	82

"Define Maintenance code" wizard

Navigation: System → User management → Define Maintenance code					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Define Maintenance code	29482	Integer	Read / Write	0 to 9 999	83
Confirm Maintenance code	29481	Integer	Read / Write	0 to 9 999	83

"Connectivity" submenu

"Bluetooth configuration" submenu

Navigation: System → Connectivity → Bluetooth configuration					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Bluetooth	27662	Integer	Read / Write	1 = Enable 2 = On touch 4 = Not available *	83

* Visibility depends on order options or device settings

"Date/time" submenu

Navigation: System → Date/time					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Set date/time	29652	Integer	Read / Write	Positive integer	84
Time format	2150	Integer	Read / Write	12 = 12 h AM/PM 24 = 24 h	84
Time zone	27339	Integer	Read / Write	0 = UTC 00:00 1 = UTC+01:00 2 = UTC+02:00 3 = UTC+03:00 4 = UTC+04:00 5 = UTC+05:00 6 = UTC+06:00 7 = UTC+07:00 8 = UTC+08:00 9 = UTC+09:00 10 = UTC+10:00 11 = UTC+11:00 12 = UTC+12:00 13 = UTC+13:00 14 = UTC+14:00 35 = UTC+03:30 45 = UTC+04:30 55 = UTC+05:30 57 = UTC+05:45 65 = UTC+06:30 87 = UTC+08:45 95 = UTC+09:30 105 = UTC+10:30 127 = UTC+12:45 135 = UTC-03:30 195 = UTC-09:30 201 = UTC-01:00 202 = UTC-02:00 203 = UTC-03:00 204 = UTC-04:00 205 = UTC-05:00 206 = UTC-06:00 207 = UTC-07:00 208 = UTC-08:00 209 = UTC-09:00 210 = UTC-10:00 211 = UTC-11:00 212 = UTC-12:00	85

"Geolocation" submenu

Navigation: System → Geolocation					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Location description	36061 to 36076	String	Read / Write	Character string comprising numbers, letters and special characters (#32)	86
Longitude	26743 to 26744	Float	Read / Write	−180 to 180 °	86
Latitude	26745 to 26746	Float	Read / Write	−90 to 90 °	86

Navigation: System → Geolocation					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Altitude	26748 to 26749	Float	Read / Write	Signed floating-point number	87
Location method	26747	Integer	Read / Write	0 = No fix 1 = GPS or Standard Positioning Service fix 2 = Differential GPS fix 3 = Precise positioning service (PPS) fix 4 = Real Time Kinetic (RTK) fixed solution 5 = Real Time Kinetic (RTK) float solution 6 = Estimated dead reckoning 7 = Manual input mode 8 = Simulation Mode	87

"Power management" submenu

Navigation: System → Power management					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Estimated battery lifetime	9772 to 9773	Float	Read	Positive floating-point number	88
Battery charge state	9872 to 9873	Float	Read	0 to 100 %	88
Confirm battery replacement	31975	Integer	Read / Write	0 = Cancel 71 = Battery 1 72 = Battery 2 *	88
Low battery diagnostic message	9663 to 9664	Float	Read / Write	Positive floating-point number	88
Capacity battery 1	32880 to 32881	Float	Read / Write	Positive floating-point number	89
Capacity battery 2	32882 to 32883	Float	Read / Write	Positive floating-point number	89

* Visibility depends on order options or device settings

"Information" submenu

"Device" submenu

Navigation: System → Information → Device					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Serial number	7003 to 7008	String	Read	Character string comprising numbers, letters and special characters (#11)	90
Order code	2058 to 2067	String	Read	Character string comprising numbers, letters and special characters (#20)	90
Firmware version	7277 to 7280	String	Read	Character string comprising numbers, letters and special characters (#8)	90
Extended order code 1	2212 to 2221	String	Read	Character string comprising numbers, letters and special characters (#20)	91
Extended order code 2	2222 to 2231	String	Read	Character string comprising numbers, letters and special characters (#20)	91
Extended order code 3	2232 to 2241	String	Read	Character string comprising numbers, letters and special characters (#20)	91
Device name	7263 to 7270	String	Read	Character string comprising numbers, letters and special characters (#16)	92
ENP version	4003 to 4010	String	Read	Character string comprising numbers, letters and special characters (#16)	92
Manufacturer	8001 to 8016	String	Read	Character string comprising numbers, letters and special characters (#32)	92

"Electronic module" submenu

Navigation: System → Information → Electronic module					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Firmware version	7039	Integer	Read	Positive integer	92

"Display module" submenu

Navigation: System → Information → Display module					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Firmware version	7039	Integer	Read	Positive integer	93

"Display" submenu

Navigation: System → Display					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Value 1 display	34918	Integer	Read / Write	1 = Volume flow 4 = Conductivity * 7 = Temperature 16 = Totalizer 1 17 = Totalizer 2 18 = Totalizer 3 66 = Pressure *	95
Value 2 display	34919	Integer	Read / Write	1 = Volume flow 4 = Conductivity * 7 = Temperature 16 = Totalizer 1 17 = Totalizer 2 18 = Totalizer 3 66 = Pressure * 251 = None	95
Value 3 display	34922	Integer	Read / Write	1 = Volume flow 4 = Conductivity * 7 = Temperature 16 = Totalizer 1 17 = Totalizer 2 18 = Totalizer 3 66 = Pressure * 251 = None	95
Value 4 display	34923	Integer	Read / Write	1 = Volume flow 4 = Conductivity * 7 = Temperature 16 = Totalizer 1 17 = Totalizer 2 18 = Totalizer 3 66 = Pressure * 251 = None	96
Display damping	27602 to 27603	Float	Read / Write	0.0 to 999.9 s	96
Brightness	36768 to 36769	Float	Read / Write	0 to 100 %	96
Color scheme	30228	Integer	Read / Write	1 = Light 2 = Dark	96
Backlight	6447	Integer	Read / Write	0 = Disable 1 = Enable	97

Navigation: System → Display					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Contrast display	30226 to 30227	Float	Read / Write	20 to 80 %	97
Rotation display	36770	Integer	Read / Write	0 = 0 degree 8 = Auto 9 = 90 degree 18 = 180 degree 27 = 270 degree	97

* Visibility depends on order options or device settings

"Software configuration" submenu

Navigation: System → Software configuration					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Activate SW option	2795	Integer	Read / Write	Positive integer	98
Software option overview	2902	Integer	Read	128 = Custody transfer 2048 = Extended data logger 16384 = Heartbeat Monitoring 32768 = Heartbeat Verification	98

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