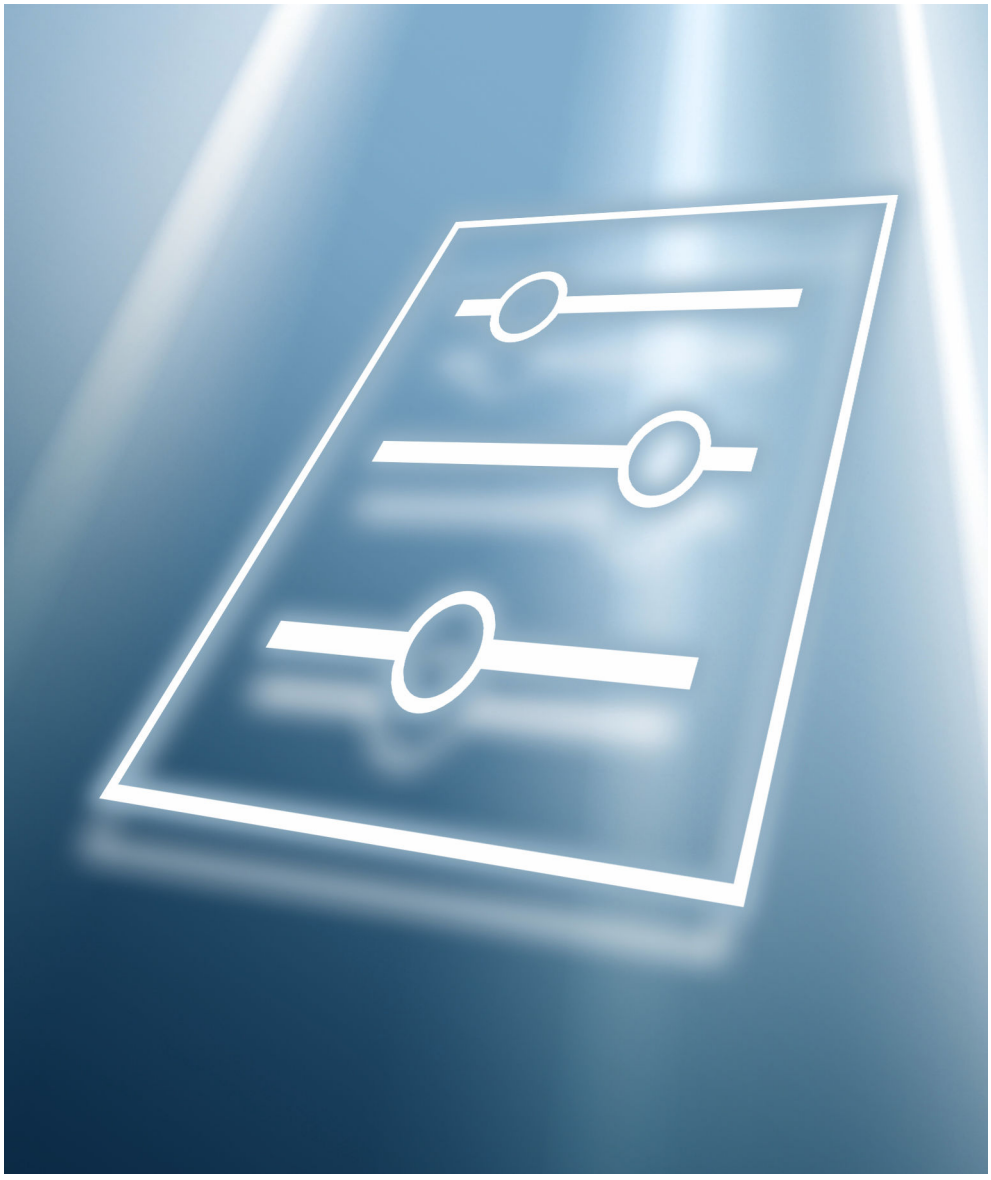
GP01220D/06/EN/01.24-00
71658070
2024-08-15

Valid as of version
04.00.zz (Device firmware)

Description of Device Parameters
Dosimass

Coriolis flowmeter
Modbus RS485



Endress+Hauser
People for Process Automation

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

Types of information

✓✓	Preferred procedures, processes or actions
✓	Permitted procedures, processes or actions
✗	Forbidden procedures, processes or actions
ℹ	Additional information
📖	Reference to documentation
📄	Reference to page
🖼	Reference to graphic

1.3.2 Information on the document structure

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

- **Guidance** menu with the **Commissioning** wizard (→ 📄 6), which guides the user automatically through all the device parameters that are required for commissioning
- **Application** menu (→ 📄 33)
- **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
Additional information	Additional explanations (e.g. in examples): ▪ On individual options ▪ On display values/data ▪ On the input range ▪ On the parameter function

1.4 Related documentation

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

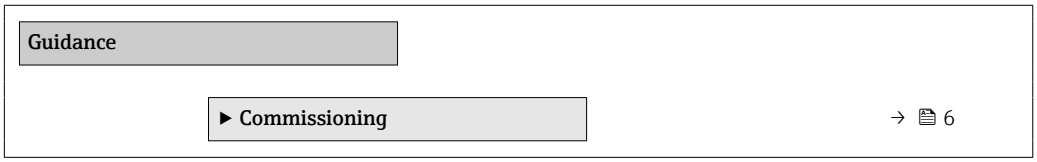
The related documentation is available online:

Device Viewer	On the www.endress.com/deviceviewer website, enter the serial number of the device: nameplate
Endress+Hauser Operations App	▶ Scan the Data Matrix code: nameplate ▶ Enter the serial number of the device: nameplate

2 "Guidance" menu

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

Navigation Guidance



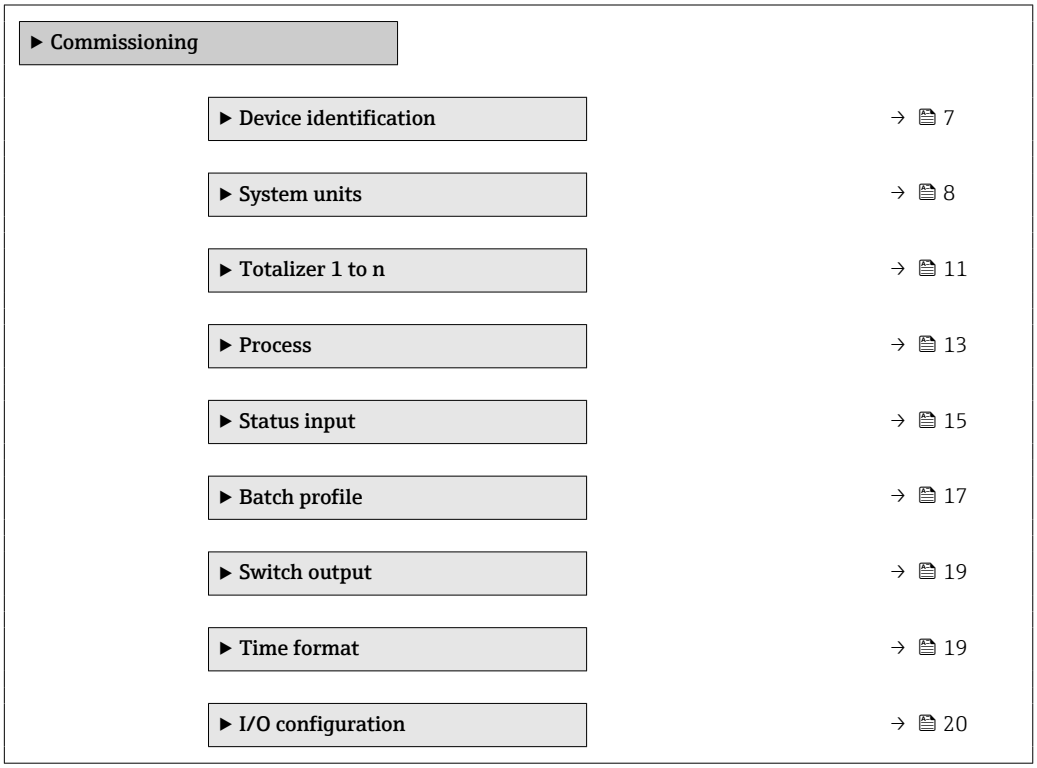
2.1 "Commissioning" wizard

Complete this wizard to commission the device.

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 have made will be saved. For this reason, the device may then be in an undefined state!
In this case, a reset to the default settings is recommended.

Navigation Guidance → Commissioning



2.1.1 Device identification

Navigation Guidance → Commissioning → Device ident.

Device tag

Navigation Guidance → Commissioning → Device ident. → Device tag

Description Enter a unique designation for the measuring point to be able to easily identify it within the plant.

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

Serial number

Navigation Guidance → Commissioning → Device ident. → Serial number

Description Displays the serial number of the measuring device. The serial number is also provided on the nameplate of the sensor and of the transmitter.

The serial number can also be used to retrieve further device-related information and documentation via the Operations app or the Device Viewer on the Endress+Hauser website.

User interface Character string comprising numbers, letters and special characters

Firmware version

Navigation Guidance → Commissioning → Device ident. → Firmware version

Description Displays the device firmware version installed.

User interface Character string comprising numbers, letters and special characters

Device name

Navigation Guidance → Commissioning → Device ident. → Device name

Description Displays the name of the transmitter. The transmitter name is also provided on the nameplate of the transmitter.

User interface Character string comprising numbers, letters and special characters

2.1.2 System units

Navigation Guidance → Commissioning → System units

Mass flow unit

Navigation Guidance → Commissioning → System units → Mass flow unit

Description Select the mass flow unit.

Selection

SI units	*US units*
▪ g/s	▪ oz/s
▪ g/min	▪ oz/min
▪ g/h	▪ oz/h
▪ g/d	▪ oz/d
▪ kg/s	▪ lb/s
▪ kg/min	▪ lb/min
▪ kg/h	▪ lb/h
▪ kg/d	▪ lb/d
▪ t/s	▪ STon/s
▪ t/min	▪ STon/min
▪ t/h	▪ STon/h
▪ t/d	▪ STon/d

Mass unit

Navigation Guidance → Commissioning → System units → Mass unit

Description Select the mass unit.

Selection

SI units	*US units*
▪ g	▪ oz
▪ kg	▪ lb
▪ t	▪ STon

Volume flow unit

Navigation Guidance → Commissioning → System units → Volume flow unit

Description Select the 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
- 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)

Additional information

Options

For an explanation of the abbreviated units: → 89

Volume unit

Navigation Guidance → Commissioning → System units → Volume unit

Description Select the volume unit.

Selection

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

US units
- af
- ft^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)

Additional information

Selection

For an explanation of the abbreviated units: → 89

Density unit

Navigation

Guidance → Commissioning → System units → Density unit

Description

Select the density unit.

Selection

SI units
- g/cm^3
- g/m^3
- g/ml
- kg/l
- kg/dm^3
- kg/m^3
- SD4°C
- SD15°C
- SD20°C
- SG4°C
- SG15°C
- SG20°C

US units
- lb/ft^3
- lb/gal (us)
- lb/bbl (us;liq.)
- lb/bbl (us;beer)
- lb/bbl (us;oil)
- lb/bbl (us;tank)

Imperial units
- lb/gal (imp)
- lb/bbl (imp;beer)
- lb/bbl (imp;oil)

Additional information

Options

For an explanation of the abbreviated units: → 89

Temperature unit

Navigation

Guidance → Commissioning → System units → Temperature unit

Description

Select the temperature unit.

Selection

SI units
- °C
- K

US units
- °F
- °R

Additional information *Selection*

For an explanation of the abbreviated units: → 89

2.1.3 Totalizer 1 to n

Navigation Guidance → Commissioning → Totalizer 1 to n

Assign process variable

Navigation Guidance → Commissioning → Totalizer 1 to n → AssignVariab. 1 to n

Description Select a process variable to activate the totalizer.

If the process variable is changed or the totalizer deactivated, the totalizer is reset to "0".

Selection
- Off
- Volume flow
- Mass flow

Process variable unit

Navigation Guidance → Commissioning → Totalizer 1 to n → VariableUnit 1 to n

Description Select the unit for the process variable of the totalizer.

Selection

SI units
- g *
- kg *
- t *

US units
- oz *
- lb *
- STon *

* Visibility depends on order options or device settings

or

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

US units
- af *
- ft^3 *
- Mft^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 → Totalizer 1 to n → Operat. mode 1 to n

Description Select the totalizer operation mode, e.g. only totalize forward flow or only totalize reverse flow.

Selection
- Net
- Forward
- Reverse

Additional information *Selection*
- **Net** 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** option
  Only the flow in the forward flow direction is totalized.
- **Reverse** option
  Only the flow in the reverse flow direction is totalized (= reverse flow quantity).

Totalizer failure behavior

Navigation Guidance → Commissioning → Totalizer 1 to n → FailureBehav. 1 to n

Description Specify how the totalizer should behave in the event of a device alarm.

Selection
- Hold
- Continue
- Last valid value + continue

Additional information *Selection*
- **Hold** option
  The totalizer is stopped in the event of a device alarm.
- **Continue** option
  The totalizer continues to totalize based on the current value measured; the device alarm is ignored.
- **Last valid value + continue** option
  The totalizer continues to totalize based on the last valid value measured before the device alarm occurred.

2.1.4 Process

Navigation Guidance → Commissioning → Process

Flow damping

Navigation Guidance → Commissioning → Process → Flow damping

Description Enter a time constant for flow damping.
Value = 0: No damping
Value > 0: Damping increases

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

User entry 0 to 99.9 s

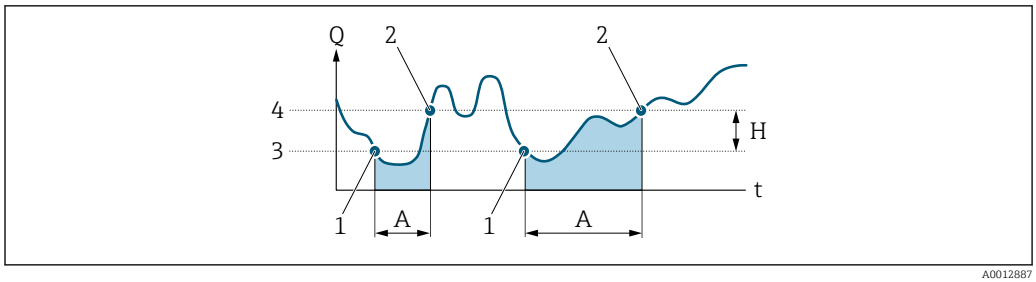
Low flow cutoff

Navigation Guidance → Commissioning → Process → Low flow cutoff

Description Select a process variable for low flow cutoff to activate low flow cutoff.

Selection
- Off
- Mass flow
- Volume flow

Additional information Description



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

On value low flow cutoff

Navigation Guidance → Commissioning → Process → On value

Description Enter on value to switch on low flow cutoff.

Value = 0: No low flow cutoff
Value > 0: Low flow cutoff is activated

User entry Positive floating-point number

Off value low flow cutoff

Navigation Guidance → Commissioning → Process → Off value

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

User entry 0 to 100.0 %

Partially filled pipe detection

Navigation Guidance → Commissioning → Process → Partial pipe det

Description Select a process variable to activate detection of an empty or partially filled pipe.

Due to low density, deactivate partially filled pipe detection for a gas.

Selection
- Off
- Density

Low value partial filled pipe detection

Navigation Guidance → Commissioning → Process → Low value

Prerequisite A process variable has been selected in the **Assign process variable** parameter in the **Empty pipe detection** submenu.

Description Enter the lower limit value for the selected process variable. If the measured value drops below the limit value, diagnostic message "862 Partly filled pipe" is generated.

The lower limit value must be lower than the upper limit value ("High value partial filled pipe detection" parameter).

User entry Signed floating-point number

High value partial filled pipe detection

Navigation Guidance → Commissioning → Process → High value

Prerequisite A process variable has been selected in the **Assign process variable** parameter in the **Empty pipe detection** submenu.

Description Enter the upper limit value for the selected process variable. If the measured value exceeds the limit value, diagnostic message "862 Partly filled pipe" is generated.

User entry Signed floating-point number

2.1.5 Status input

Navigation Guidance → Commissioning → Status input

Assign status input

Navigation Guidance → Commissioning → Status input → Assign stat.inp.

Description Assign a function to the status input. When the signal level switches from inactive to active ("Active level" parameter), the function assigned is triggered.

Selection
- Off
- Start batch
- Start & stop batch
- Reset totalizer 1
- Reset totalizer 2
- Reset totalizer 3
- Reset all totalizers
- Flow override

Additional information *Selection*

- **Start batch** option
  Starts a batch, provided a batch is not already in progress. Once started, the batch procedure continues until complete.
- **Start & stop batch** option
  Starts a batch, provided a batch is not already in progress. If a batch is in progress, the batch is stopped. In this case, drip is not measured and no new drip correction quantity is calculated for the next batch.
- **Reset totalizer 1** option
  Resets the totalizer 1.
- **Reset totalizer 2** option
  Resets the totalizer 2.
- **Reset totalizer 3** option
  Resets the totalizer 3.
- **Reset all totalizers** option
  Resets all totalizers.
- **Flow override** option
  Activates flow override. Flow override is active until the signal level switches back from active to inactive.

Active level

Navigation Guidance → Commissioning → Status input → Active level

Description Select the signal level that triggers the function assigned to the status input.

Selection

- High
- Low

Additional information *Selection*

- **High** option
  The function is triggered when a voltage is present.
- **Low** option
  The function is triggered when no voltage is present.

Response time status input

Navigation Guidance → Commissioning → 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 10 to 200 ms

2.1.6 Batch profile 1 to n

Navigation Guidance → Commissioning → Batch profile

Assign process variable

Navigation Guidance → Commissioning → Batch profile → AssignVariab.

Description Select a process variable.

Selection
- Off
- Mass flow
- Volume flow

Batch unit

Navigation Guidance → Commissioning → Batch profile → Batch unit

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

Description Select the unit.

Selection

SI units
- kg *
- g *

US units
- oz *
- lb *

* Visibility depends on order options or device settings

or

SI units
- l *
- dm^3 *
- cm^3 *
- ml *

US units
- ft^3 *
- fl oz (us) *
- gal (us) *

* Visibility depends on order options or device settings

Fill quantity

Navigation Guidance → Commissioning → Batch profile → Fill quantity

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

Description Enter the fill quantity.

User entry Signed floating-point number

Drip measurement mode

Navigation Guidance → Commissioning → Batch profile → Drip measurement

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

The **Off** option is not selected in the **Drip measurement mode** parameter (→ 18).

Description Select the drip measurement mode.

Drip is measured at the end of each batch and applied to calculate the drip corrrection quantity for the next following batch. Depending on the setting for the "Drip correction mode" parameter, the drip correction quantity is used to determine the shut-off time of the valve.

Selection
- Off
- Fixed time
- Fixed time or low flow cut off

Additional information *Selection*

- **Off** option
  Drip measurement is deactivated. Instead, if a fixed drip correction quantity is specified ("Fixed correction quantity" parameter), this amount is deducted from the fill quantity specified to determine the valve shut-off time.
- **Fixed time** option
  Drip is measured from the valve shut-off time until the time period specified ("Measuring time drip quantity" parameter) has elapsed.
  For the first batch after commissioning, the drip correction quantity is set to the quantity specified in the "Fixed correction quantity" parameter. If no fixed correction quantity is specified, the drip correction quantity is set to 10% of the total fill quantity ("Fill quantity" parameter).
- **Fixed time or low flow cut off** option
  Drip is measured from the valve shut-off time until the time period specified ("Measuring time drip quantity" parameter) has elapsed or until low flow cut off is reached, whichever is first.
  For the first batch after commissioning, the drip correction quantity is set to the quantity specified in the "Fixed correction quantity" parameter. If no fixed correction quantity is specified, the drip correction quantity is set to 10% of the total fill quantity ("Fill quantity" parameter).

2.1.7 Switch output

Navigation Guidance → Commissioning → Switch output

Switch output function

Navigation Guidance → Commissioning → Switch output → SwitchOutFunct 1

Description Assign a function to the switch output.

Selection
- Closed
- Open
- Batching

Additional information *Selection*
- **Closed** option
  The switch output is permanently switched on (closed, conductive).
- **Open** option
  The switch output is permanently switched off (open, non-conductive).
- **Batching** option
  The switch output is controlled by the batching function. For a two-stage process or a one-stage process with blowout, the first switch output controls the first valve, and the second switch output controls the second valve.

2.1.8 Time format

Navigation Guidance → Commissioning → Time format

Time format

Navigation Guidance → Commissioning → Time format → Time format

Description Select the time format.

Selection
- 24 h
- 12 h AM/PM

Additional information *Selection*

For an explanation of the abbreviated units: → 89

2.1.9 I/O configuration

Navigation Guidance → Commissioning → I/O config.

Input/output

Navigation Guidance → Commissioning → I/O config. → Input/output

Description Set the universal input/output to the input/output type required.

Selection
- Off
- Status input
- Batch status
- Switch output 1
- Switch output 2

Additional information *Selection*
- **Off** option
  The universal input/output is not used.
- **Status input** option
  Performs the function assigned to the status input.
- **Batch status** option
  Indicates whether a batch is in progress.
- **Switch output 1** option
  Indicates the state of switch output 1.
- **Switch output 2** option
  Indicates the state of switch output 2.

Apply I/O configuration

Navigation Guidance → Commissioning → I/O config. → Apply I/O config

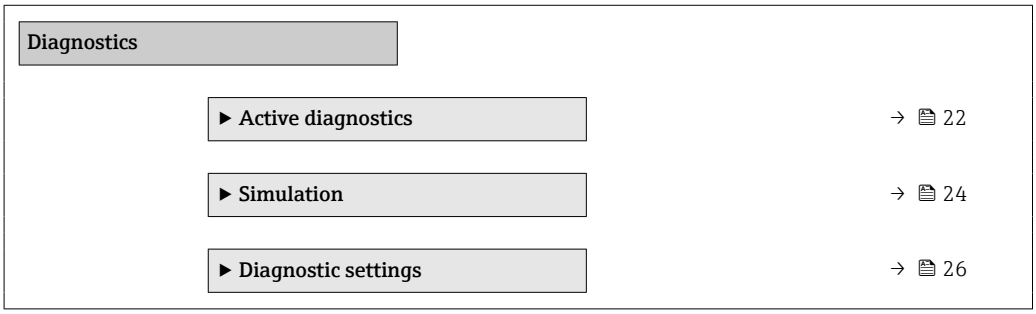
Description Indicate whether to apply the configuration to the universal input/output.

Selection
- No
- Yes

3 "Diagnostics" menu

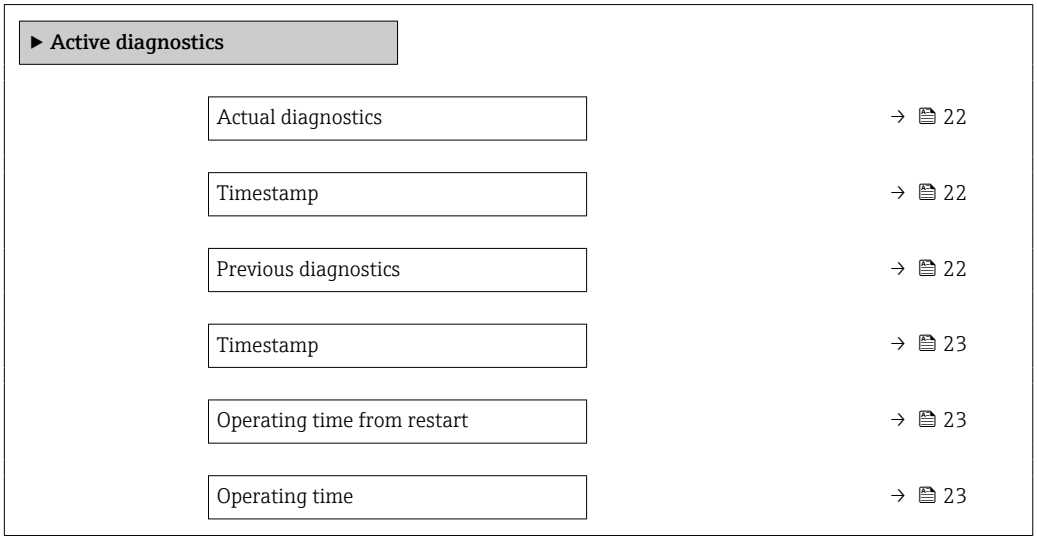
Troubleshooting and preventive maintenance – settings for device behavior during process and device events as well as assistance and measures for diagnostic purposes.

Navigation Diagnostics



3.1 Active diagnostics

Navigation Diagnostics → Active diagnos.



Actual diagnostics

Navigation Diagnostics → Active diagnos. → Actual diagnos.

Prerequisite A diagnostic event has occurred.

Description Displays the currently active diagnostic message.

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

User interface Positive integer

Timestamp

Navigation Diagnostics → Active diagnos. → Timestamp

Description Displays the timestamp for the currently active diagnostic message.

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

Previous diagnostics

Navigation Diagnostics → Active diagnos. → Prev.diagnostics

Prerequisite At least two diagnostic events have already occurred.

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

User interface Positive integer

Timestamp

Navigation Diagnostics → Active diagnos. → Timestamp

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

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

Operating time from restart

Navigation Diagnostics → Active diagnos. → Time fr. restart

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

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

Operating time

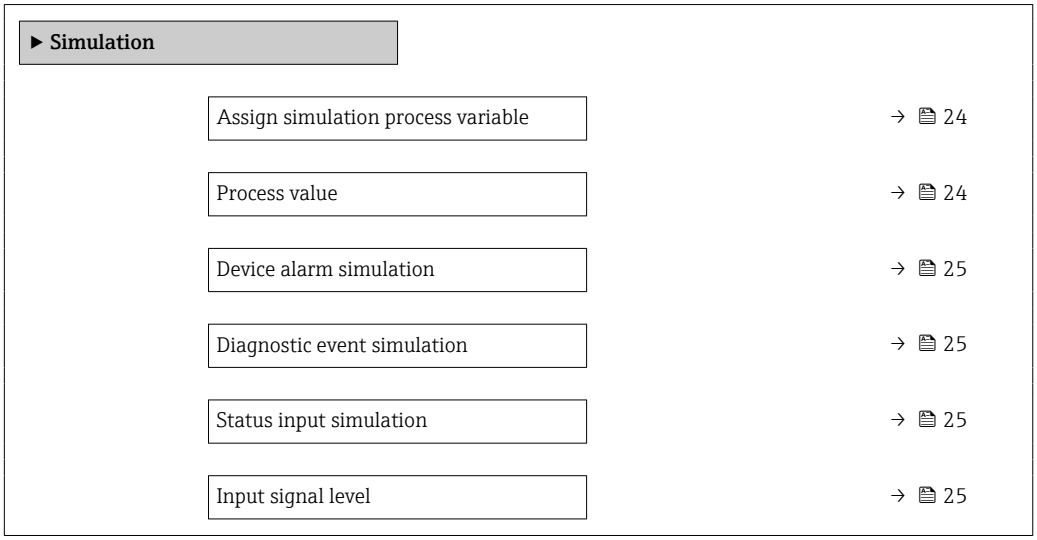
Navigation Diagnostics → Active diagnos. → Operating time

Description Indicates how long the device has been in operation.

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

3.2 Simulation

Navigation Diagnostics → Simulation



Assign simulation process variable

Navigation Diagnostics → Simulation → Assign proc.var.

Description Select a process variable to activate the simulation.

Selection
- Off
- Mass flow
- Volume flow
- Density
- Temperature

Additional information *Description*

The display alternates between the measured value and a diagnostics message of the "function check" category (C) when simulation is active.

Process value

Navigation Diagnostics → Simulation → Process value

Description Enter the process value to simulate.

The unit is set in the "System units" menu.

User entry Signed floating-point number

Device alarm simulation

Navigation Diagnostics → Simulation → Dev. alarm sim.

Description Switch the device alarm simulation on or off.

While simulation is in progress, a diagnostic message of the Function Check (C) category is displayed.

Selection
- Off
- On

Diagnostic event simulation

Navigation Diagnostics → Simulation → Diagnostic event

Description Select the diagnostic event to simulate.

Selection Off

Status input simulation

Navigation Diagnostics → Simulation → StatusInp.sim.

Description Switch simulation of the status input on or off.

Selection
- Off
- On

Input signal level

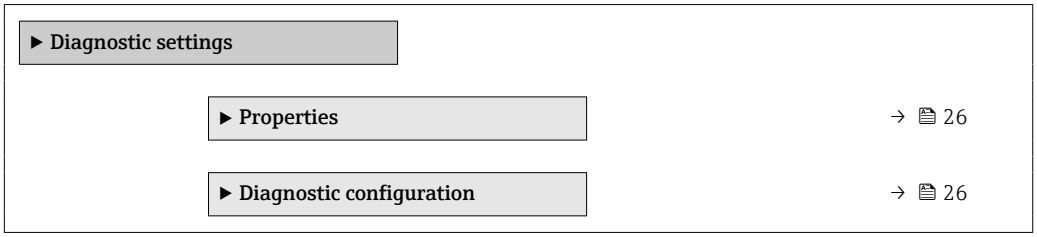
Navigation Diagnostics → Simulation → InputSignLevel

Description Select the signal level to simulate.

Selection
- High
- Low

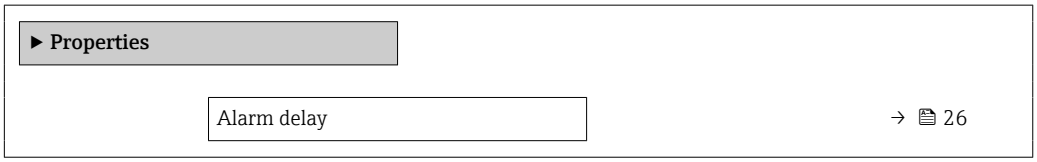
3.3 Diagnostic settings

Navigation Diagnostics → Diag. settings



3.3.1 Properties

Navigation Diagnostics → Diag. settings → Properties



Alarm delay

Navigation Diagnostics → Diag. settings → Properties → Alarm delay

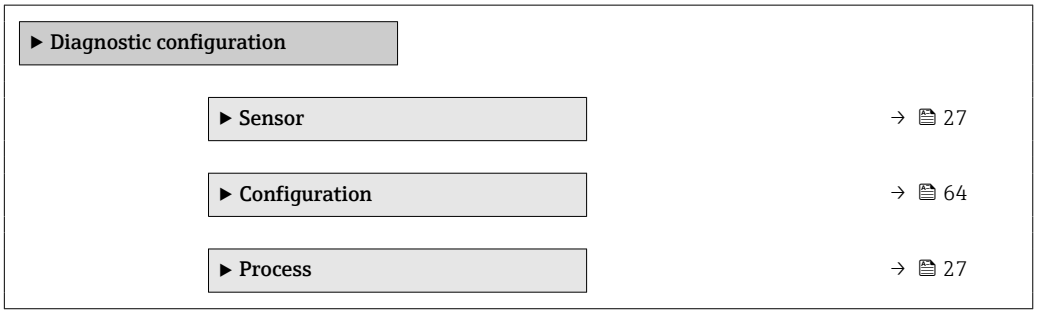
Description Enter a delay to suppress momentarily pending diagnostic messages.

Only applies to diagnostic events that allow for a delay before the diagnostic message is generated.

User entry 0 to 60 s

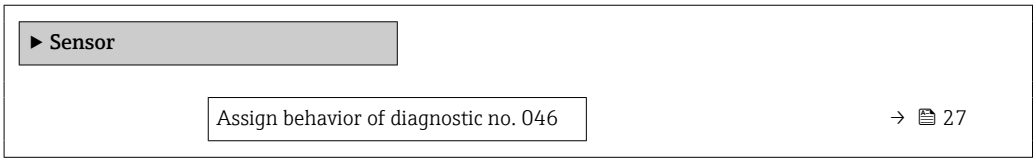
3.3.2 Diagnostic configuration

Navigation Diagnostics → Diag. settings → Diag. config.



Sensor

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



Assign behavior of diagnostic no. 046

Navigation Diagnostics → Diag. settings → Diag. config. → Sensor → Diagnostic no. 046

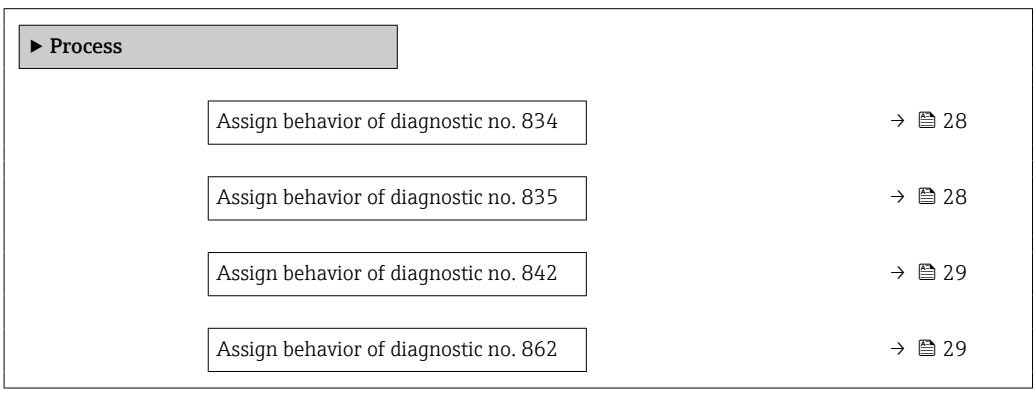
Description Select behavior for diagnostic event "046 Sensor limit exceeded".

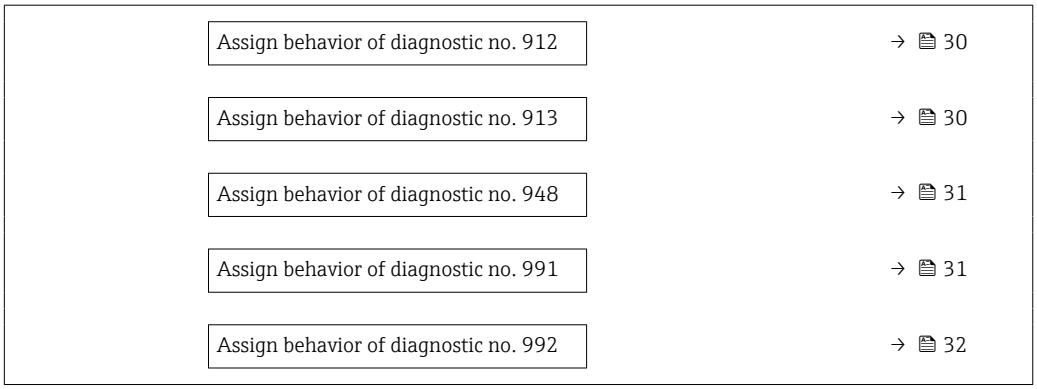
Selection
- Off
- Alarm
- Warning
- Logbook entry only

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.

Process

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





Assign behavior of diagnostic no. 834

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

Description Select behavior for diagnostic event "834 Process temperature too high".

Selection
- Off
- Alarm
- Warning
- Logbook entry only

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

Assign behavior of diagnostic no. 835

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 835

Description Select behavior for diagnostic event "835 Process temperature too low".

Selection
- 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 below 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. 862

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 862

Description Select behavior for diagnostic event "862 Partly filled pipe".

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. 912

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 912

Description Select behavior for diagnostic event "912 Medium inhomogeneous".

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. 913

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 913

Description Select behavior for diagnostic event "913 Medium unsuitable".

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. 948

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 948

Description Select behavior for diagnostic event "948 Oscillation damping 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. 991

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 991

Description Select behavior for diagnostic event "991 Batch process aborted".

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. 992

Navigation Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 992

Description Select behavior for diagnostic event "992 Batch start failed".

Selection

- Off
- Alarm
- Warning
- Logbook entry only

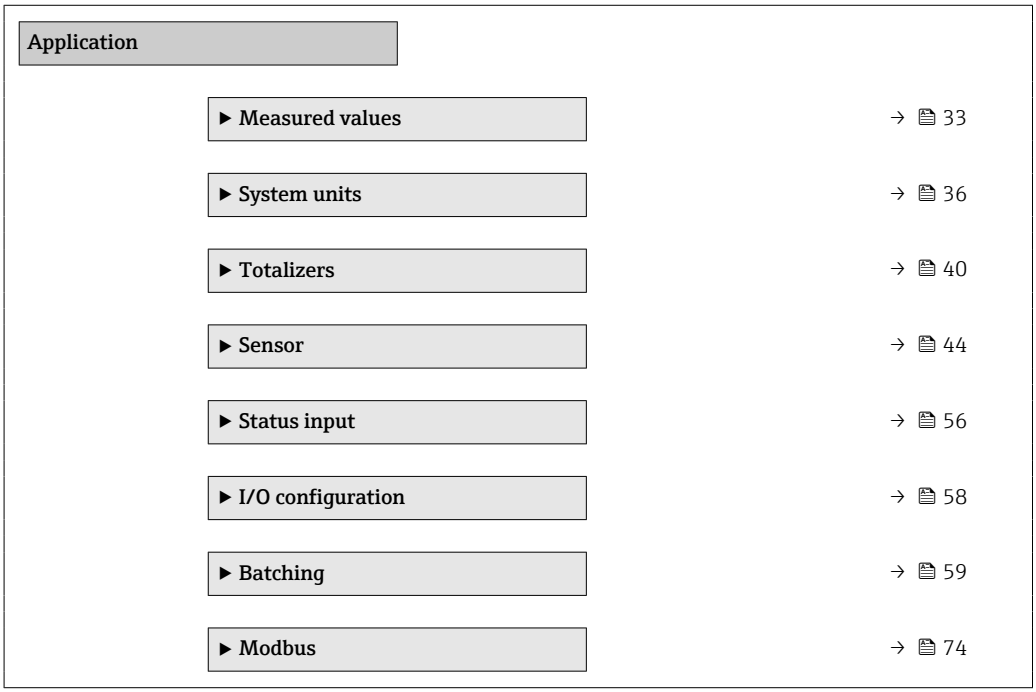
Additional information *Selection*

- **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 "Application" menu

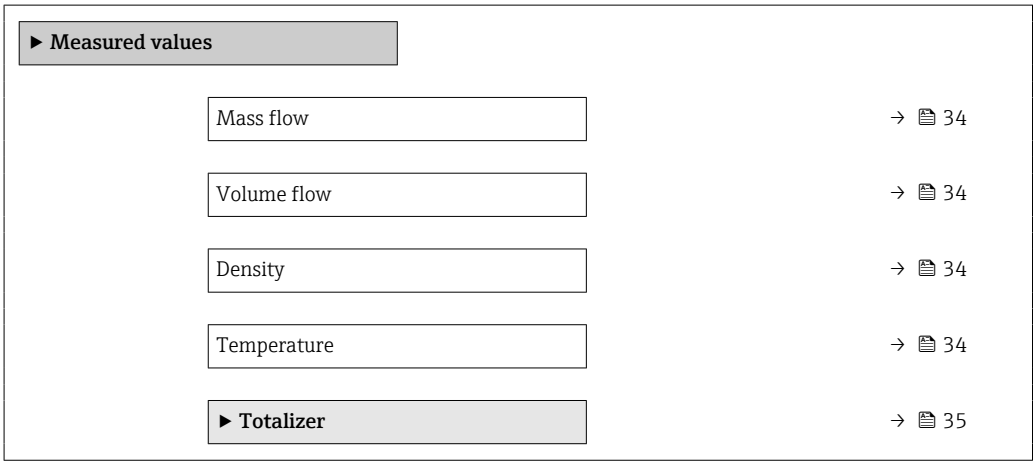
Targeted optimization to the application – comprehensive device settings from sensor technology to system integration for optimum application adaptation.

Navigation Application



4.1 Measured values

Navigation Application → Measured values



Mass flow

Navigation Application → Measured values → Mass flow

Description Displays the mass flow measured.
The unit is set in the "System units" menu.

User interface Signed floating-point number

Volume flow

Navigation Application → Measured values → Volume flow

Description Displays the volume flow measured.
The unit is set in the "System units" menu.

User interface Signed floating-point number

Density

Navigation Application → Measured values → Density

Description Displays the density measured.
The unit is set in the "System units" menu.

User interface Positive floating-point number

Temperature

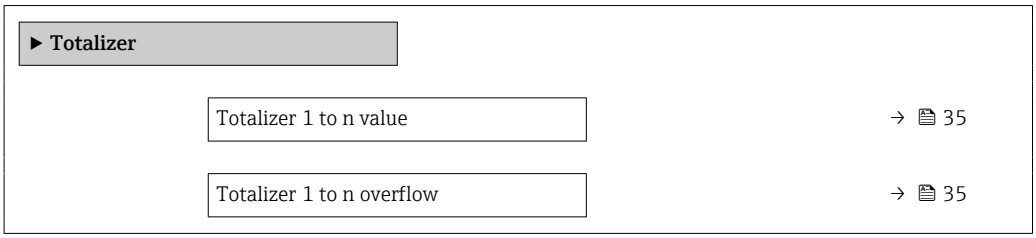
Navigation Application → Measured values → Temperature

Description Displays the medium temperature measured.
The unit is set in the "System units" menu.

User interface Positive floating-point number

4.1.1 Totalizer

Navigation Application → Measured values → Totalizer



Totalizer value

Navigation Application → Measured values → Totalizer → Tot. 1 to n value

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

Description Displays the totalizer counter since the last reset.

This parameter can only display figures up to 7 digits. If the counter exceeds this range, the overflow is displayed in the "Totalizer overflow " parameter.

Example:

Value of "Totalizer value" parameter: 1,968,457 m^3
Value of "Totalizer overflow " parameter: 1 × 10^7 (1 overflow) = 10,000,000 m^3
Counter (total): 11,968,457 m^3

In the event of a fault condition, the totalizer behaves as specified in the "Totalizer failure behavior" parameter.

User interface Signed floating-point number

Totalizer overflow

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

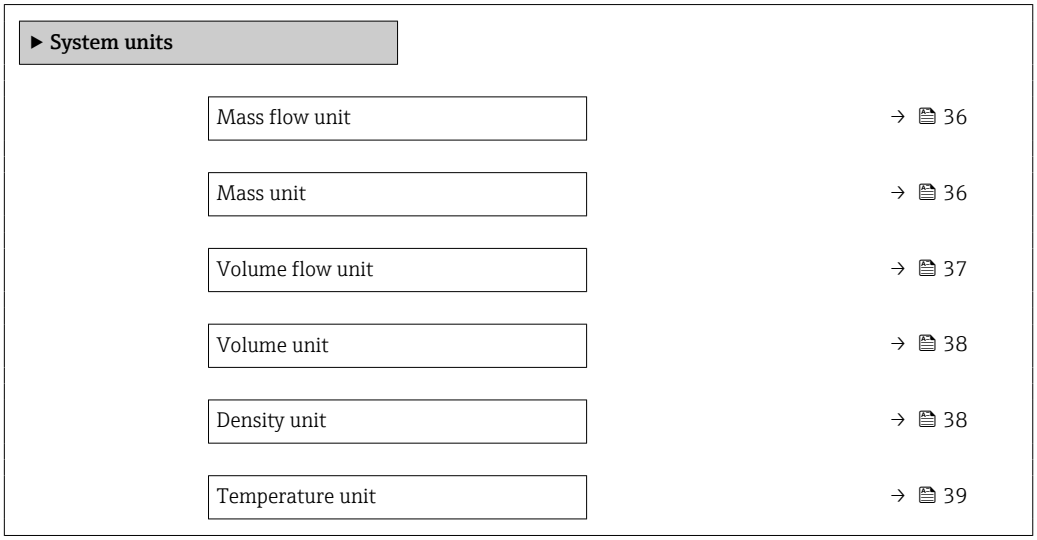
Prerequisite A process variable has been selected in the **Assign process variable** parameter in the **Totalizer 1 to n** submenu.

Description Displays the number of overflows for the totalizer counter ("Totalizer value" parameter).

User interface −32 000.0 to 32 000.0

4.2 System units

Navigation Application → System units



Mass flow unit

Navigation Application → System units → Mass flow unit

Description Select the mass flow unit.

Selection

SI units
- g/s
- g/min
- g/h
- g/d
- kg/s
- kg/min
- kg/h
- kg/d
- t/s
- t/min
- t/h
- t/d

US units
- oz/s
- oz/min
- oz/h
- oz/d
- lb/s
- lb/min
- lb/h
- lb/d
- STon/s
- STon/min
- STon/h
- STon/d

Mass unit

Navigation Application → System units → Mass unit

Description Select the mass unit.

Selection

SI units
- g
- kg
- t

US units
- oz
- lb
- STon

Volume flow unit

Navigation Application → System units → Volume flow unit

Description Select the 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
- 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)

Additional information *Options*

For an explanation of the abbreviated units: → 89

Volume unit

Navigation Application → System units → Volume unit

Description Select the volume unit.

Selection

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

US units
- af
- ft^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)

Additional information *Selection*

For an explanation of the abbreviated units: → 89

Density unit

Navigation Application → System units → Density unit

Description Select the density unit.

Selection

SI units
- g/cm^3
- g/m^3
- g/ml
- kg/l
- kg/dm^3
- kg/m^3
- SD4°C
- SD15°C
- SD20°C
- SG4°C
- SG15°C
- SG20°C

US units
- lb/ft^3
- lb/gal (us)
- lb/bbl (us;liq.)
- lb/bbl (us;beer)
- lb/bbl (us;oil)
- lb/bbl (us;tank)

Imperial units
- lb/gal (imp)
- lb/bbl (imp;beer)
- lb/bbl (imp;oil)

Additional information *Options*

For an explanation of the abbreviated units: → 89

Temperature unit

Navigation Application → System units → Temperature unit

Description Select the temperature unit.

Selection

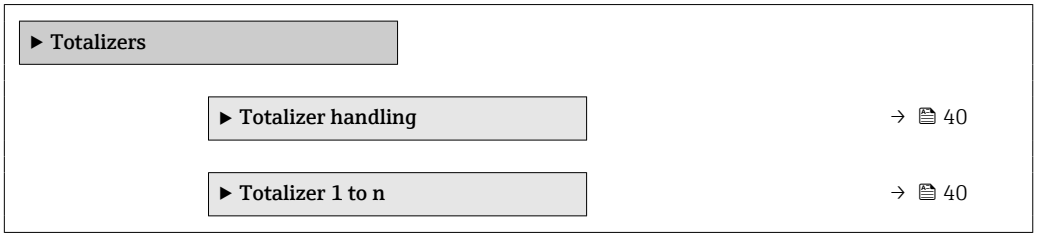
SI units	*US units*
▪ ℃	▪ ℉
▪ K	▪ ℉R

Additional information *Selection*

For an explanation of the abbreviated units: → 89

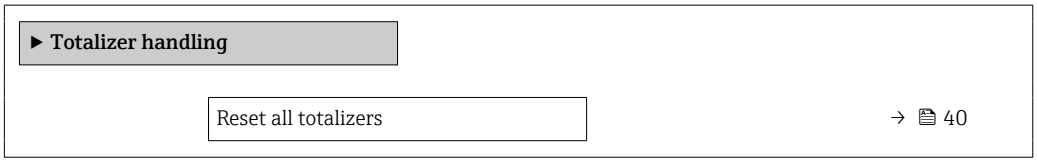
4.3 Totalizers

Navigation Application → Totalizers



4.3.1 Totalizer handling

Navigation Application → Totalizers → Totalizer



Reset all totalizers

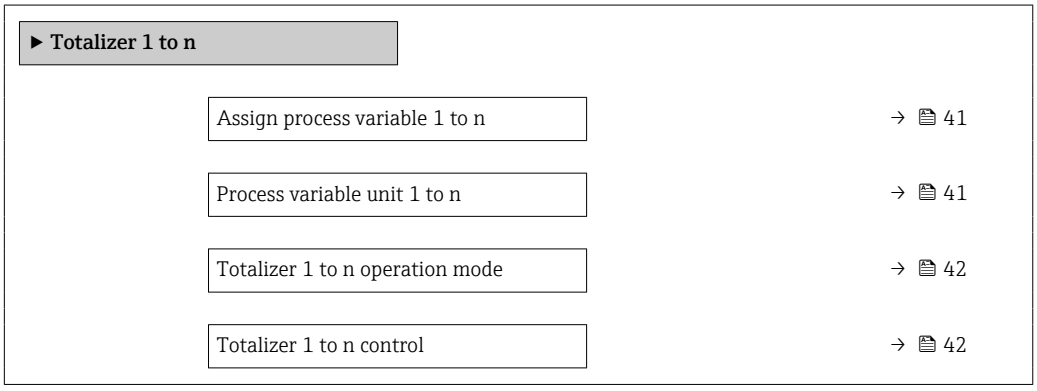
Navigation Application → Totalizers → Totalizer → Reset all tot.

Description Reset all totalizers to "0" and restart the totalizers. The counter readings are not logged prior to the reset.

Selection
- Cancel
- Reset + totalize

4.3.2 Totalizer 1 to n

Navigation Application → Totalizers → Totalizer 1 to n



Preset value 1 to n	→ 43
Totalizer 1 to n failure behavior	→ 43

Assign process variable

Navigation Application → Totalizers → Totalizer 1 to n → AssignVariab. 1 to n

Description Select a process variable to activate the totalizer.

If the process variable is changed or the totalizer deactivated, the totalizer is reset to "0".

Selection
- Off
- Volume flow
- Mass flow

Process variable unit

Navigation Application → Totalizers → Totalizer 1 to n → VariableUnit 1 to n

Description Select the unit for the process variable of the totalizer.

Selection

SI units
- g *
- kg *
- t *

US units
- oz *
- lb *
- STon *

* Visibility depends on order options or device settings

or

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

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

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

* Visibility depends on order options or device settings

or

Other units
None *

*	Visibility depends on order options or device settings

Totalizer operation mode

Navigation Application → Totalizers → Totalizer 1 to n → Operat. mode 1 to n

Description Select the totalizer operation mode, e.g. only totalize forward flow or only totalize reverse flow.

Selection
- Net
- Forward
- Reverse

Additional information *Selection*
- **Net** 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** option
  Only the flow in the forward flow direction is totalized.
- **Reverse** option
  Only the flow in the reverse flow direction is totalized (= reverse flow quantity).

Totalizer control

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

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

Description Operate the totalizer.

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

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

- **Reset + totalize** option
  The totalizer is reset to "0" and restarted.
- **Preset + totalize** option
  The totalizer is stopped and set to the start value specified in the "Preset value " parameter.
- **Hold** option
  The totalizer is stopped.

Preset value

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

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

Description Specify a start value for the totalizer.

User entry Signed floating-point number

Additional information

Description

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 11).

Example

This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.

Totalizer failure behavior

Navigation Application → Totalizers → Totalizer 1 to n → FailureBehav. 1 to n

Description Specify how the totalizer should behave in the event of a device alarm.

Selection

- Hold
- Continue
- Last valid value + continue

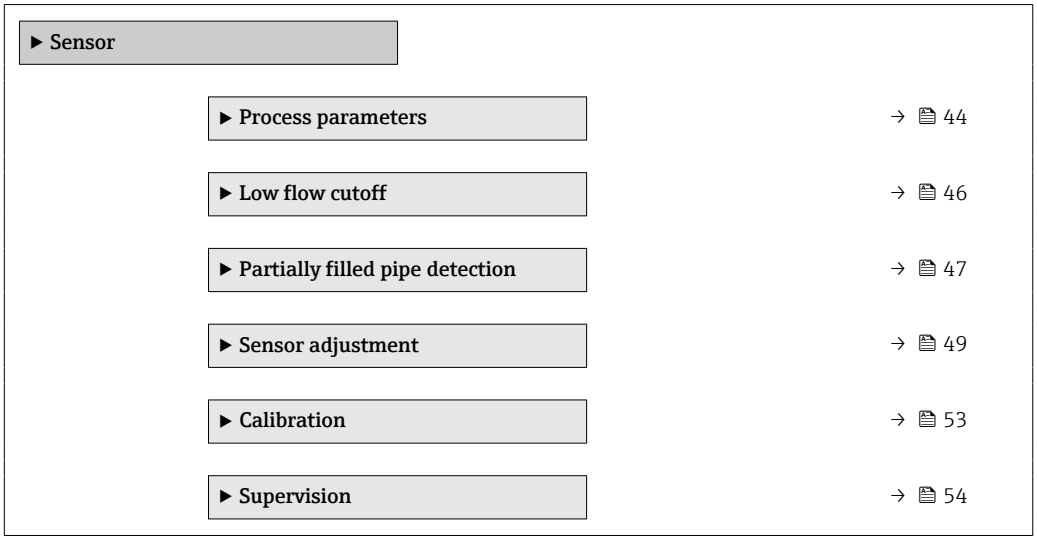
Additional information

Selection

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

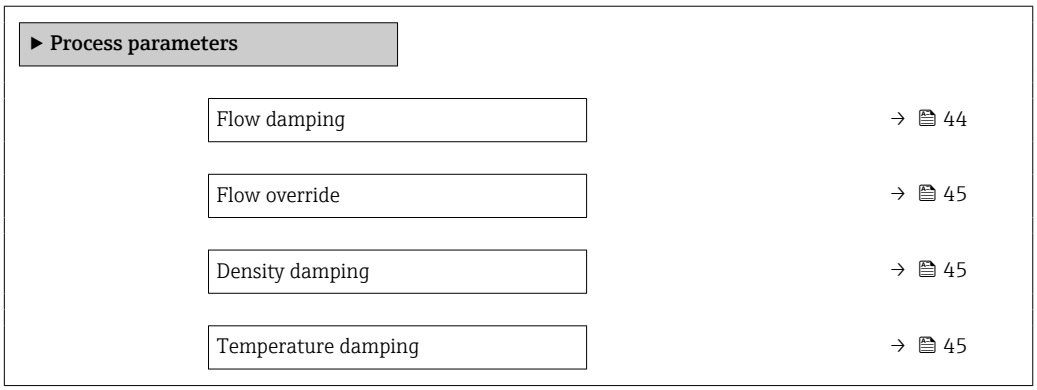
4.4 Sensor

Navigation Application → Sensor



4.4.1 Process parameters

Navigation Application → Sensor → Process param.



Flow damping

Navigation Application → Sensor → Process param. → Flow damping

Description Enter a time constant for flow damping.
Value = 0: No damping
Value > 0: Damping increases

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 Reports the flow rate as zero until flow override is deactivated. Can be used for example when cleaning the pipeline.

Selection
- Off
- On

Additional information

Selection

"On" option
Activates flow override and the diagnostic message "453 Flow override active" is generated.

Values reported:
Flow variables: Zero
Other process variables: As measured
Totalizers: Stop totalizing

Effect

This setting affects all the functions of the measuring device.

Positive zero return is not relevant for most applications.

Density damping

Navigation Application → Sensor → Process param. → Density damping

Description Enter a time constant for the damping applied to the value measured for density.
Value = 0: No damping
Value > 0: Damping increases

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

User entry 0 to 999.9 s

Temperature damping

Navigation Application → Sensor → Process param. → Temp. damping

Description Enter a time constant for the damping applied to the value measured for temperature.
Value = 0: No damping
Value > 0: Damping increases

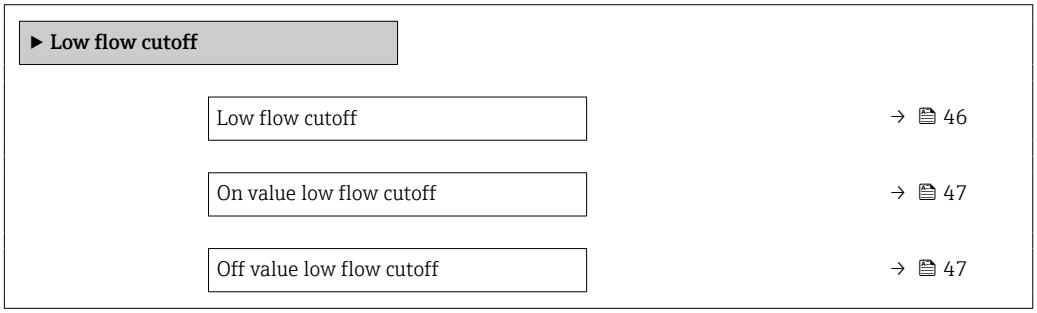
Damping is implemented by means of a proportional transmission behavior with first order delay (PT1 element).

User entry 0 to 999.9 s

4.4.2 Low flow cutoff

Low flow cut off is an important function for many applications to shut out inherent noise from the measuring device and the application in the lower measuring range. If the flow drops below a certain minimum value, the value is set to **0** so that the flow signal can be kept at the zero point between two batches.

Navigation Application → Sensor → Low flow cutoff



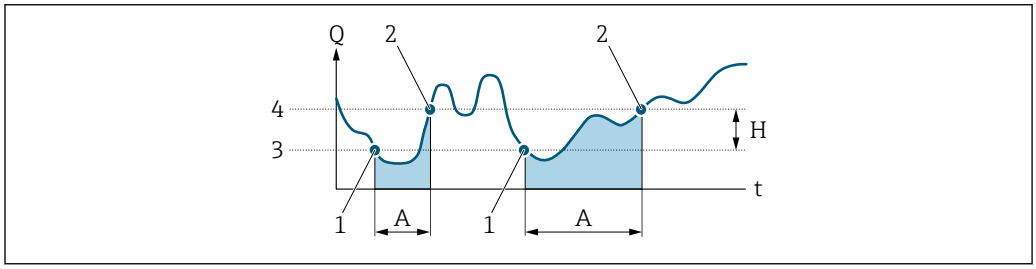
Low flow cutoff

Navigation Application → Sensor → Low flow cutoff → Low flow cutoff

Description Select a process variable for low flow cutoff to activate low flow cutoff.

Selection
- Off
- Mass flow
- Volume flow

Additional information Description



A0012887

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

On value low flow cutoff

Navigation Application → Sensor → Low flow cutoff → On value

Description Enter on value to switch on low flow cutoff.

Value = 0: No low flow cutoff
Value > 0: Low flow cutoff is activated

User entry Positive floating-point number

Off value low flow cutoff

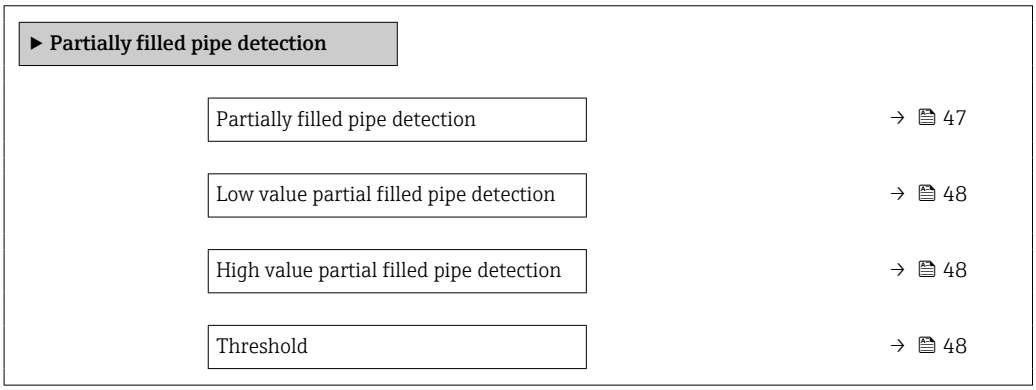
Navigation Application → Sensor → Low flow cutoff → Off value

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

User entry 0 to 100.0 %

4.4.3 Partially filled pipe detection

Navigation Application → Sensor → Partial pipe det



Partially filled pipe detection

Navigation Application → Sensor → Partial pipe det → Partial pipe det

Description Select a process variable to activate detection of an empty or partially filled pipe.

Due to low density, deactivate partially filled pipe detection for a gas.

Selection
- Off
- Density

Low value partial filled pipe detection

Navigation Application → Sensor → Partial pipe det → Low value

Prerequisite A process variable has been selected in the **Assign process variable** parameter in the **Empty pipe detection** submenu.

Description Enter the lower limit value for the selected process variable. If the measured value drops below the limit value, diagnostic message "862 Partly filled pipe" is generated.

The lower limit value must be lower than the upper limit value ("High value partial filled pipe detection" parameter).

User entry Signed floating-point number

High value partial filled pipe detection

Navigation Application → Sensor → Partial pipe det → High value

Prerequisite A process variable has been selected in the **Assign process variable** parameter in the **Empty pipe detection** submenu.

Description Enter the upper limit value for the selected process variable. If the measured value exceeds the limit value, diagnostic message "862 Partly filled pipe" is generated.

User entry Signed floating-point number

Threshold

Navigation Application → Sensor → Partial pipe det → Threshold

Description Enter the threshold for oscillation damping. When oscillation damping exceeds the threshold, the pipe is detected as partially filled, the flow rate is reported as 0, and the diagnostic message "862 Partly filled pipe" is generated.

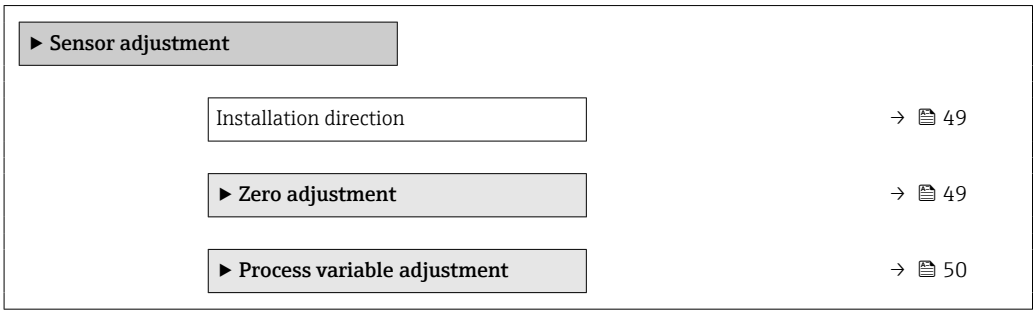
If the medium is inhomogeneous or contains air bubbles, oscillation damping of the measuring tubes increases. Oscillation damping also depends on application-specific variables, such as medium, nominal diameter, and sensor.

For a full tube, oscillation damping will typically be around 500. For a partially filled pipe, oscillation damping rises to > 5000. Therefore, a threshold of 2000 is recommended. If set to 0, partially filled pipe detection via oscillation damping is deactivated.

User entry Positive floating-point number

4.4.4 Sensor adjustment

Navigation Application → Sensor → Sensor adjustm.



Installation direction

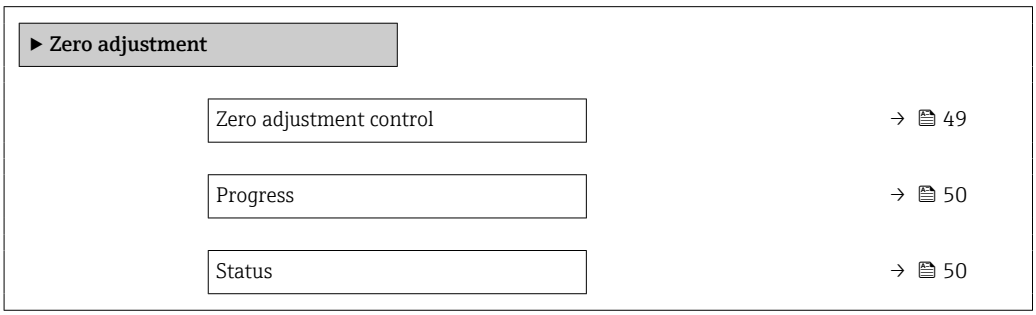
Navigation Application → Sensor → Sensor adjustm. → Install. direct.

Description Select the sign of the flow direction.

Selection
- Forward flow
- Reverse flow

Zero adjustment

Navigation Application → Sensor → Sensor adjustm. → Zero adjustment



Zero adjustment control

Navigation Application → Sensor → Sensor adjustm. → Zero adjustment → ZeroAdjustContr.

Description Start or cancel a zero point adjustment.

The following conditions must be met to perform a zero point adjustment successfully:

The actual flow rate must be 0.
The pressure must be at least 1.034 bar.

Selection
- Cancel
- Start

Progress

Navigation Application → Sensor → Sensor adjustm. → Zero adjustment → Progress

Description Shows the progress of the process.

User interface 0 to 100 %

Status

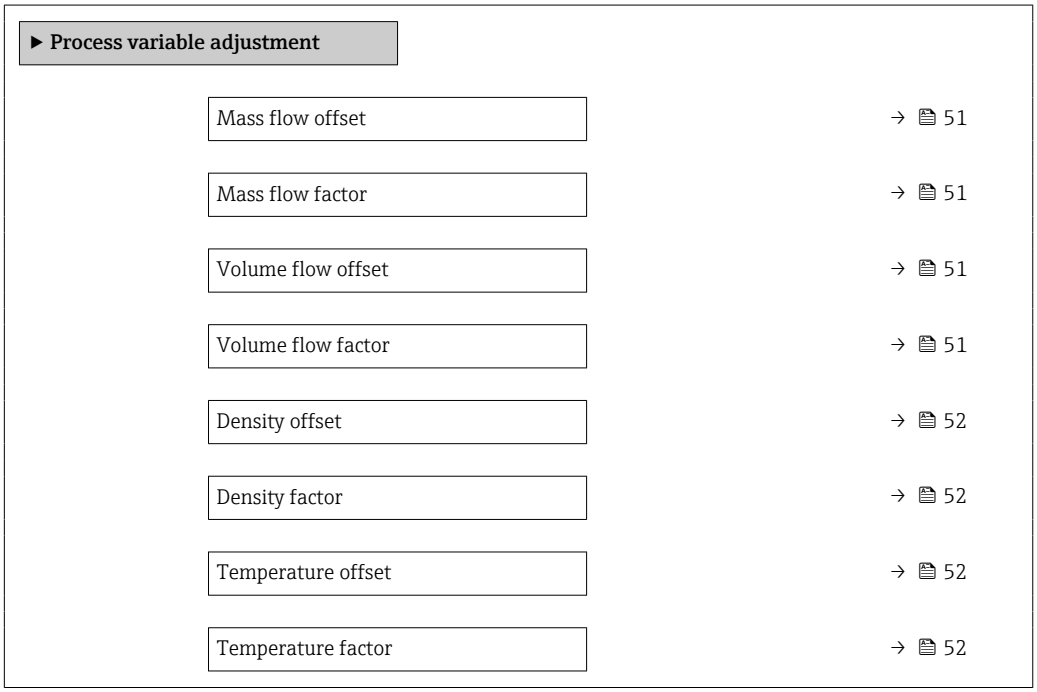
Navigation Application → Sensor → Sensor adjustm. → Zero adjustment → Status

Description Displays the status of the zero point adjustment.

User interface
- Busy
- Failed
- Done

Process variable adjustment

Navigation Application → Sensor → Sensor adjustm. → Variable adjust



Mass flow offset

Navigation Application → Sensor → Sensor adjustm. → Variable adjust → Mass flow offset

Description Enter the offset by which to shift the zero point for mass flow in kg/s.

User entry Signed floating-point number

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

Mass flow factor

Navigation Application → Sensor → Sensor adjustm. → Variable adjust → Mass flow factor

Description Enter the multiplication factor to apply to the mass flow value.

User entry Positive floating-point number

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

Volume flow offset

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

Description Enter the offset by which to shift the zero point for volume flow in m3/s.

User entry Signed floating-point number

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

Volume flow factor

Navigation Application → Sensor → Sensor adjustm. → Variable adjust → Vol. flow factor

Description Enter the multiplication factor to apply to the volume flow.

User entry Positive floating-point number

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

Density offset

Navigation Application → Sensor → Sensor adjustm. → Variable adjust → Density offset

Description Enter the offset by which to shift the zero point for density in kg/m3.

User entry Signed floating-point number

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

Density factor

Navigation Application → Sensor → Sensor adjustm. → Variable adjust → Density factor

Description Enter the multiplication factor to apply to the density value.

User entry Positive floating-point number

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

Temperature offset

Navigation Application → Sensor → Sensor adjustm. → Variable adjust → Temp. offset

Description Enter the offset by which to shift the zero point for temperature in K.

User entry Signed floating-point number

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

Temperature factor

Navigation Application → Sensor → Sensor adjustm. → Variable adjust → Temp. factor

Description Enter the multiplication factor to apply to the temperature value.

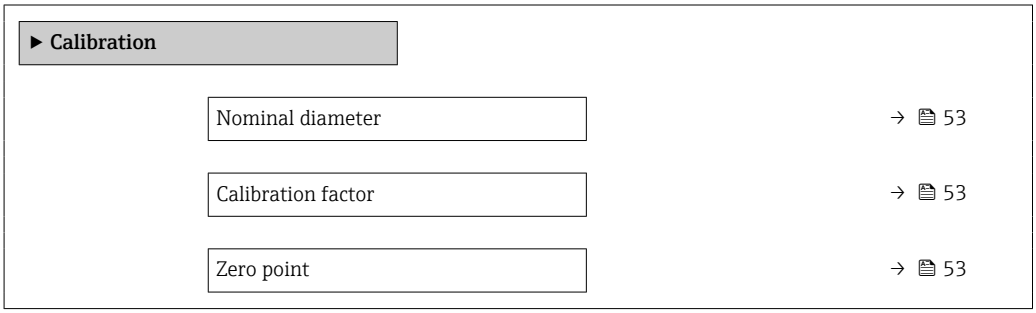
User entry Positive floating-point number

Additional information *Description*

Corrected value = (factor × value) + offset

4.4.5 Calibration

Navigation Application → Sensor → Calibration



Nominal diameter

Navigation Application → Sensor → Calibration → Nominal diameter

Description Displays the nominal diameter of the sensor.

User interface Character string comprising numbers, letters and special characters

Calibration factor

Navigation Application → Sensor → Calibration → Cal. factor

Description Displays the current calibration factor for the sensor. The factory setting for the calibration factor can be found on the sensor's nameplate.

User interface Signed floating-point number

Zero point

Navigation Application → Sensor → Calibration → Zero point

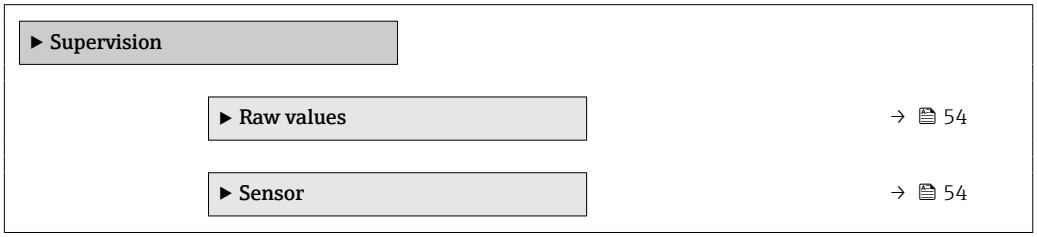
Description Displays the zero point correction value for the sensor.

Users logged on in the Service role have write access.

User entry Signed floating-point number

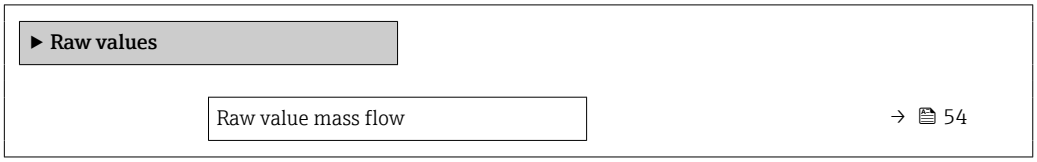
4.4.6 Supervision

Navigation Application → Sensor → Supervision



Raw values

Navigation Application → Sensor → Supervision → Raw values



Raw value mass flow

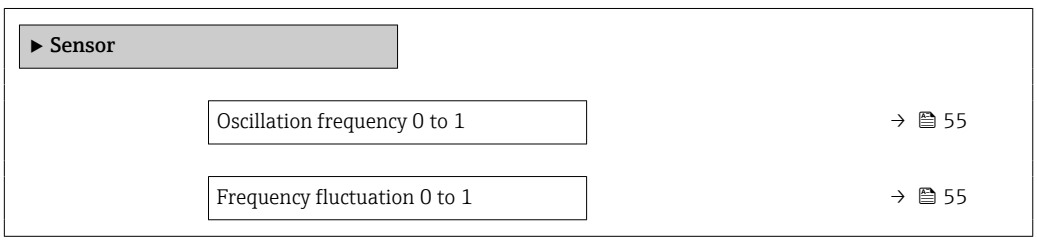
Navigation Application → Sensor → Supervision → Raw values → Raw mass flow

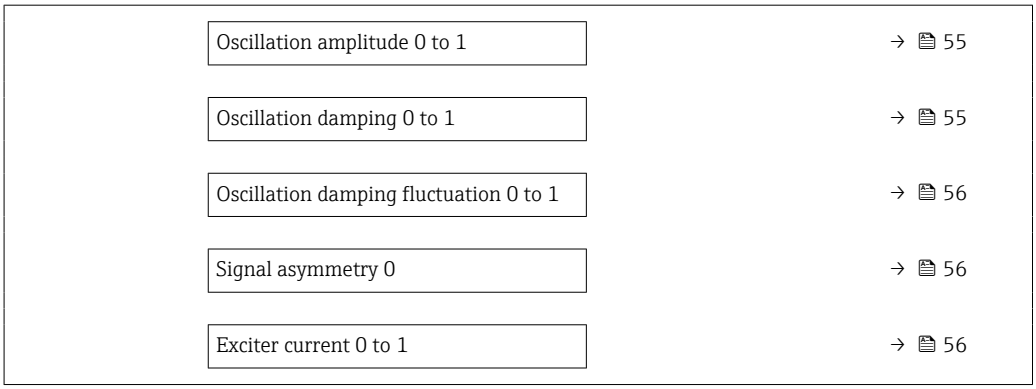
Description Displays the mass flow value before offset and factor correction, damping, low flow cut off and monitoring of a partially filled pipe. This value can be used to verify that the current zero point is within range.

User interface Signed floating-point number

Sensor

Navigation Application → Sensor → Supervision → Sensor





Oscillation frequency 0 to 1

Navigation Application → Sensor → Supervision → Sensor → Osc. freq. 0 to 1

Description Displays the current oscillation frequency.

User interface Signed floating-point number

Frequency fluctuation 0 to 1

Navigation Application → Sensor → Supervision → Sensor → Freq. fluct. 0 to 1

Description Displays the current frequency fluctuation.

User interface Signed floating-point number

Oscillation amplitude 0 to 1

Navigation Application → Sensor → Supervision → Sensor → Osc. ampl. 0 to 1

Description Displays the oscillation amplitude of the sensor relative to the value under ideal conditions.

User interface Signed floating-point number

Oscillation damping 0 to 1

Navigation Application → Sensor → Supervision → Sensor → Osc. damping 0 to 1

Description Displays the current oscillation damping. Oscillation damping is an indicator for the sensor's current demand for excitation power.

User interface Positive floating-point number

Oscillation damping fluctuation 0 to 1

Navigation Application → Sensor → Supervision → Sensor → Osc.damp.fluct0 to 1

Description Displays the current fluctuation in oscillation damping.

User interface Signed floating-point number

Signal asymmetry 0

Navigation Application → Sensor → Supervision → Sensor → Signal asymm. 0

Description Displays the relative difference between the signal amplitudes of the inlet sensor and the outlet sensor of the first oscillation mode.

User interface Signed floating-point number

Exciter current 0 to 1

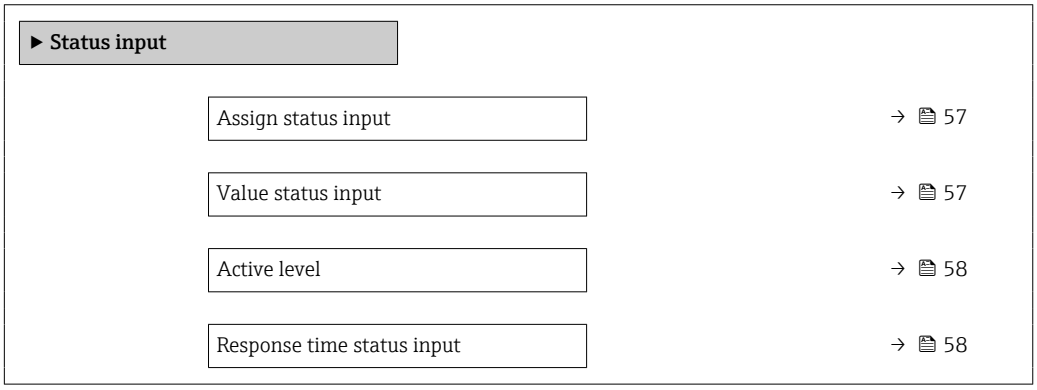
Navigation Application → Sensor → Supervision → Sensor → Exc. current 0 to 1

Description Displays the actual excitation current.

User interface Signed floating-point number

4.5 Status input

Navigation Application → Status input



Assign status input

Navigation Application → Status input → Assign stat.inp.

Description Assign a function to the status input. When the signal level switches from inactive to active ("Active level" parameter), the function assigned is triggered.

Selection
- Off
- Start batch
- Start & stop batch
- Reset totalizer 1
- Reset totalizer 2
- Reset totalizer 3
- Reset all totalizers
- Flow override

Additional information *Selection*
- **Start batch** option
  Starts a batch, provided a batch is not already in progress. Once started, the batch procedure continues until complete.
- **Start & stop batch** option
  Starts a batch, provided a batch is not already in progress. If a batch is in progress, the batch is stopped. In this case, drip is not measured and no new drip correction quantity is calculated for the next batch.
- **Reset totalizer 1** option
  Resets the totalizer 1.
- **Reset totalizer 2** option
  Resets the totalizer 2.
- **Reset totalizer 3** option
  Resets the totalizer 3.
- **Reset all totalizers** option
  Resets all totalizers.
- **Flow override** option
  Activates flow override. Flow override is active until the signal level switches back from active to inactive.

Value status input

Navigation Application → Status input → Val.stat.inp.

Description Shows the current input signal level.

User interface
- High
- Low

Active level

Navigation Application → Status input → Active level

Description Select the signal level that triggers the function assigned to the status input.

Selection
- High
- Low

Additional information *Selection*
- **High** option
  The function is triggered when a voltage is present.
- **Low** option
  The function is triggered when no voltage is present.

Response time status input

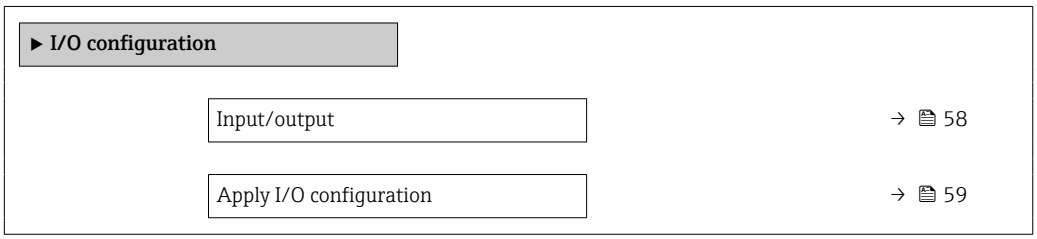
Navigation Application → Status input → Response time

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

User entry 10 to 200 ms

4.6 I/O configuration

Navigation Application → I/O config.



Input/output

Navigation Application → I/O config. → Input/output

Description Set the universal input/output to the input/output type required.

Selection
- Off
- Status input
- Batch status
- Switch output 1
- Switch output 2

Additional information *Selection*
- **Off** option
  The universal input/output is not used.
- **Status input** option
  Performs the function assigned to the status input.
- **Batch status** option
  Indicates whether a batch is in progress.
- **Switch output 1** option
  Indicates the state of switch output 1.
- **Switch output 2** option
  Indicates the state of switch output 2.

Apply I/O configuration

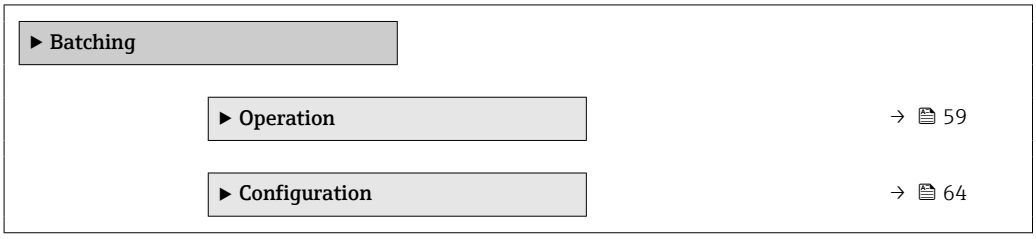
Navigation Application → I/O config. → Apply I/O config

Description Indicate whether to apply the configuration to the universal input/output.

Selection
- No
- Yes

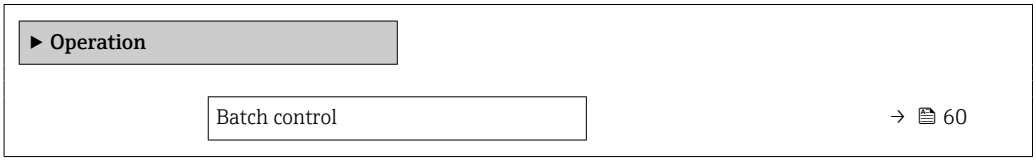
4.7 Batching

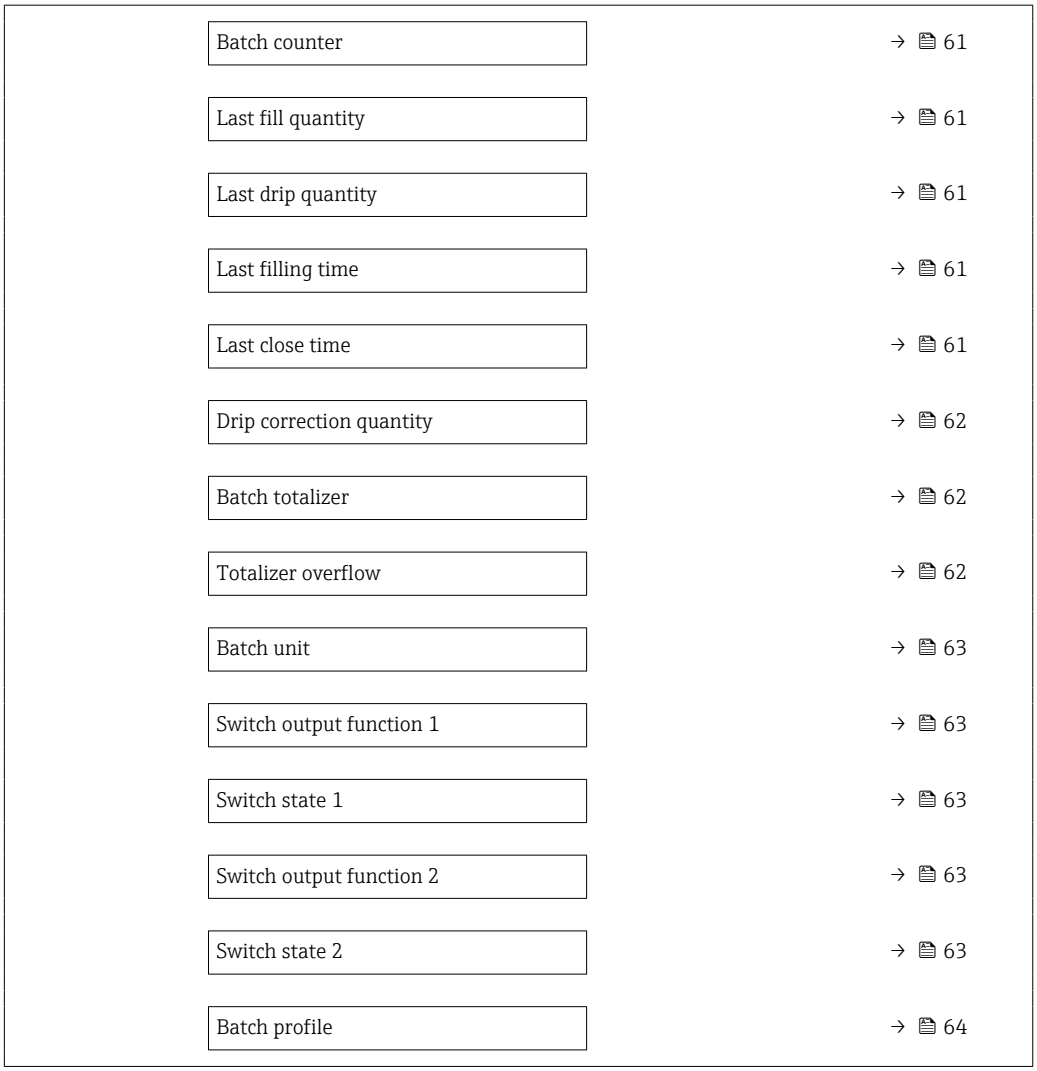
Navigation Application → Batching



4.7.1 Operation

Navigation Application → Batching → Operation





Batch control

Navigation Application → Batching → Operation → Batch control

Description Start or stop the batch process. Use to control the batch process via a fieldbus or manually via a device interface.

Selection
- Start
- Stop

Additional information *Selection*
- **Start** option
  Starts a batch, provided a batch is not already in progress.
- **Stop** option
  Stops the batch, provided a batch is in progress. Drip is not measured and no new drip correction quantity is calculated for the next batch. The batch counter increments by 1.

Batch counter

Navigation Application → Batching → Operation → Batch counter

Description Displays the number of batches completed since the last reset.

The counter is automatically reset whenever the profile ("Batch profile" parameter) or the process variable assigned to the profile is changed.

User interface Positive integer

Last fill quantity

Navigation Application → Batching → Operation → Last fill qty

Description Displays the total quantity of the last batch, including drip.

User interface Signed floating-point number

Last drip quantity

Navigation Application → Batching → Operation → Last drip qty

Description Displays the drip quantity of the last batch.

User interface Signed floating-point number

Last filling time

Navigation Application → Batching → Operation → Last fill. time

Description Displays the filling time for the last batch from the opening of the valve until the end of drip measurement. This parameter is reset to 0 at the start of each new batch.

User interface Positive floating-point number

Last close time

Navigation Application → Batching → Operation → Last close time

Description Displays the valve close time for the last batch from the valve shut-off time until the end of drip measurement. This parameter is reset to 0 at the start of each new batch.

User interface Positive floating-point number

Drip correction quantity

Navigation Application → Batching → Operation → Drip corr. qty

Description Displays the drip correction quantity for the next batch. Depending on the setting for the "Drip correction mode" parameter, the drip correction quantity is used to determine the valve shut-off time.

The drip correction quantity is derived from the mean of the filtered drip quantities ("Drip median filter" parameter) for the number of batches specified in the "Average drip correction quantity" parameter.

User interface Signed floating-point number

Batch totalizer

Navigation Application → Batching → Operation → Batch totalizer

Description Displays the total fill quantity of all batches for the selected profile since the last reset.

The counter (includes the overflow) is automatically reset whenever the profile ("Batch profile" parameter) or the process variable assigned to the profile is changed.

This parameter can only display figures up to 7 digits. If the counter exceeds this range, the overflow is displayed in the "Totalizer overflow " parameter.

Example:

Value of "Batch totalizer" parameter: 196 845,7 ml
Value of "Totalizer overflow " parameter: 2 · 10^7 (2 overflows) = 20 000 000 ml
Counter (total): 20 196 845,7 ml

User interface Signed floating-point number

Totalizer overflow

Navigation Application → Batching → Operation → Tot. overflow

Description Displays the number of overflows for the batch totalizer ("Batch totalizer" parameter).

User interface −32 000.0 to 32 000.0

Batch unit

Navigation Application → Batching → Operation → Batch unit

Description Displays the unit set for the profile.

User interface

SI units	*US units*
▪ kg	▪ oz
▪ l	▪ lb
▪ g	▪ ft^3
▪ dm^3	▪ fl oz (us)
▪ cm^3	▪ gal (us)
▪ ml	

Switch output function

Navigation Application → Batching → Operation → SwitchOutFunct 1
Application → Batching → Operation → SwitchOutFunct 2

Description Assign a function to the switch output.

Selection
- Closed
- Open
- Batching

Additional information *Selection*
- **Closed** option
  The switch output is permanently switched on (closed, conductive).
- **Open** option
  The switch output is permanently switched off (open, non-conductive).
- **Batching** option
  The switch output is controlled by the batching function. For a two-stage process or a one-stage process with blowout, the first switch output controls the first valve, and the second switch output controls the second valve.

Switch state

Navigation Application → Batching → Operation → Switch state 1
Application → Batching → Operation → Switch state 2

Description Indicates the current switch state of the switch output.

User interface
- Open
- Closed

Additional information *User interface*

- **Open** option
  The switch output is not conductive. If the "Switch output function " parameter is set to "Batching", switching to the non-conductive state causes the valve to close.
- **Closed** option
  The switch output is conductive. If the "Switch output function " parameter is set to "Batching", switching to the conductive state causes the valve to open.

Batch profile

Navigation Application → Batching → Operation → Batch profile

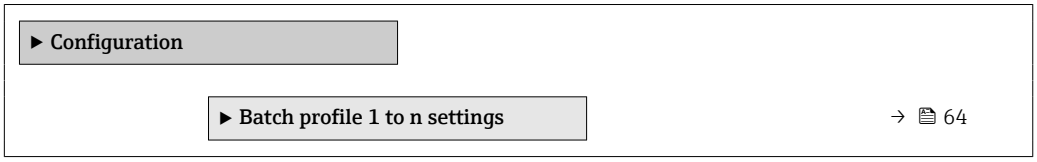
Description Displays the profile currently in operation. Select a different profile, as required. The profile settings can be modified in the "Batch profile settings" menu.

Selection

- Profile 1
- Profile 2
- Profile 3
- Profile 4
- Profile 5
- Profile 6

4.7.2 Configuration

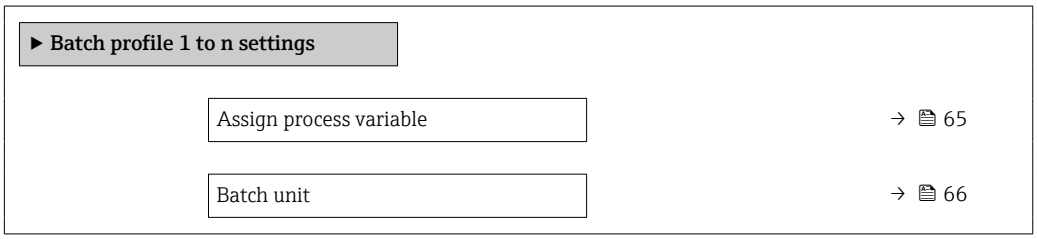
Navigation Application → Batching → Configuration

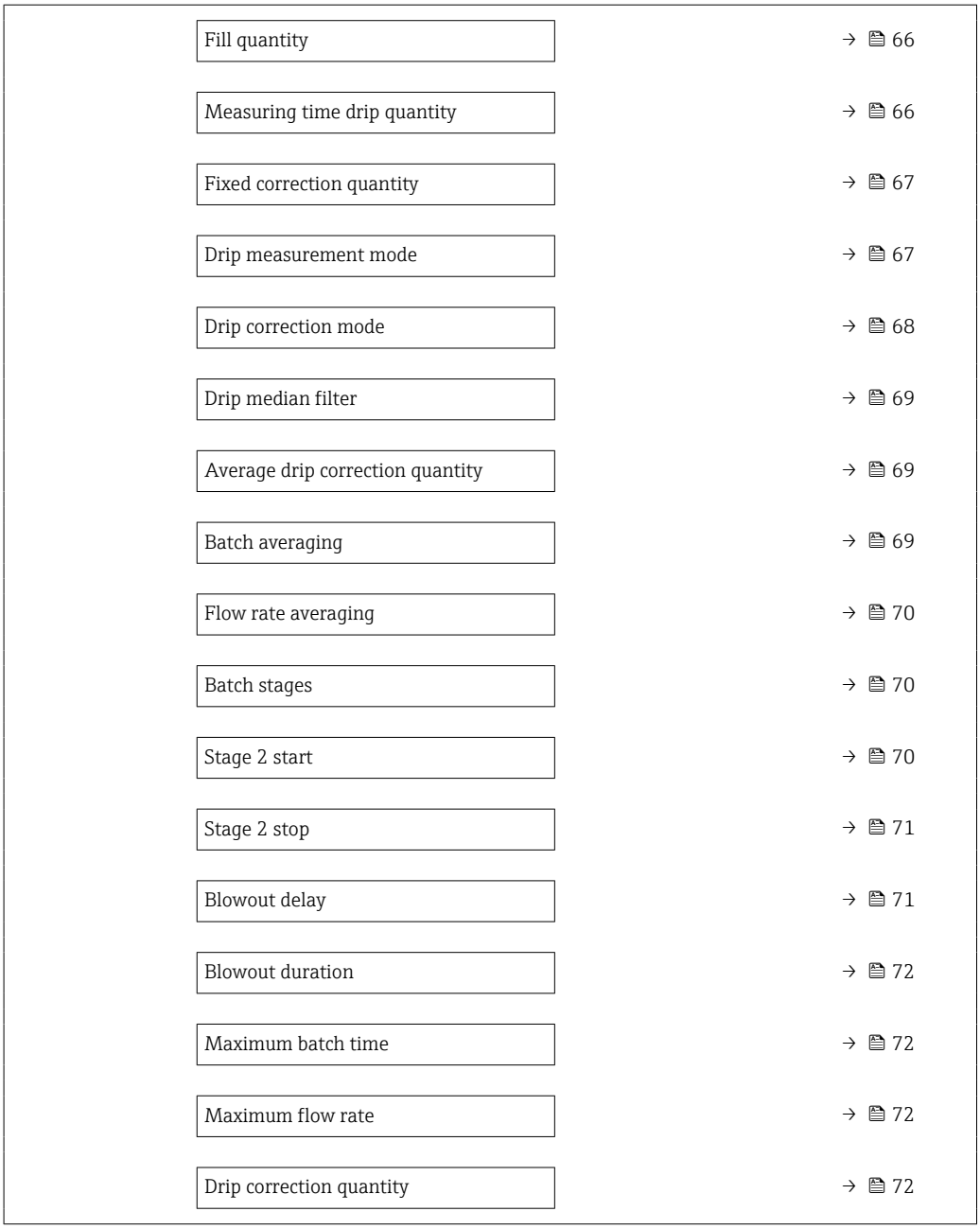


Batch profile 1 to n settings

The following conditions must be met to start a batching process.
- There is no diagnostic message from the **Alarm** category.
- The batch quantity must be > **0**.
- The last batching process has been completed (including possible blowout).
- The **Batching** option is selected in the **Switch output function** parameter (→ 19).

Navigation Application → Batching → Configuration → Batch profile 1 to n





Assign process variable

Navigation Application → Batching → Configuration → Batch profile 1 to n → AssignVariab.

Description Select a process variable.

Selection
- Off
- Mass flow
- Volume flow

Batch unit

Navigation Application → Batching → Configuration → Batch profile 1 to n → Batch unit

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

Description Select the unit.

Selection

SI units
- kg *
- g *

US units
- oz *
- lb *

* Visibility depends on order options or device settings

or

SI units
- l *
- dm^3 *
- cm^3 *
- ml *

US units
- ft^3 *
- fl oz (us) *
- gal (us) *

* Visibility depends on order options or device settings

Fill quantity

Navigation Application → Batching → Configuration → Batch profile 1 to n → Fill quantity

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

Description Enter the fill quantity.

User entry Signed floating-point number

Measuring time drip quantity

Navigation Application → Batching → Configuration → Batch profile 1 to n → Meas. time drip

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

Description Specify the time period over which to measure the drip quantity after the valve shut-off time is reached.

User entry 0.01 to 100 s

Fixed correction quantity

Navigation Application → Batching → Configuration → Batch profile 1 to n → Fixed corr. qty

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

Description Specify the drip correction quantity to deduct from the fill quantity to determine the valve shut-off time.

This setting only applies for the inital batch after comissioning the device or if the "Drip measurement mode" parameter is set to "Off".

For the initial batch after commissiong, if this parameter is set to "0", the drip correction quantity is set to 10% of the fill quantity ("Fill quantity" parameter).

User entry Signed floating-point number

Drip measurement mode

Navigation Application → Batching → Configuration → Batch profile 1 to n → Drip measurement

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

The **Off** option is not selected in the **Drip measurement mode** parameter (→ 18).

Description Select the drip measurement mode.

Drip is measured at the end of each batch and applied to calculate the drip corrrection quantity for the next following batch. Depending on the setting for the "Drip correction mode" parameter, the drip correction quantity is used to determine the shut-off time of the valve.

Selection
- Off
- Fixed time
- Fixed time or low flow cut off

Additional information *Selection*

- **Off** option
  Drip measurement is deactivated. Instead, if a fixed drip correction quantity is specified ("Fixed correction quantity" parameter), this amount is deducted from the fill quantity specified to determine the valve shut-off time.
- **Fixed time** option
  Drip is measured from the valve shut-off time until the time period specified ("Measuring time drip quantity" parameter) has elapsed.
  For the first batch after commissioning, the drip correction quantity is set to the quantity specified in the "Fixed correction quantity" parameter. If no fixed correction quantity is specified, the drip correction quantity is set to 10% of the total fill quantity ("Fill quantity" parameter).
- **Fixed time or low flow cut off** option
  Drip is measured from the valve shut-off time until the time period specified ("Measuring time drip quantity" parameter) has elapsed or until low flow cut off is reached, whichever is first.
  For the first batch after commissioning, the drip correction quantity is set to the quantity specified in the "Fixed correction quantity" parameter. If no fixed correction quantity is specified, the drip correction quantity is set to 10% of the total fill quantity ("Fill quantity" parameter).

Drip correction mode

Navigation Application → Batching → Configuration → Batch profile 1 to n → Drip correction

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

Description Select the drip correction mode. The drip correction mode determines how the valve shut-off time is determined.

Selection

- Standard
- Dynamic
- Time-controlled

Additional information *Selection*

- **Standard** option
  The valve shut-off time is determined by the drip correction quantity calculated for the batch ("Drip correction quantity" parameter).
- **Dynamic** option
  The valve shut-off time is adjusted dynamically based on the flow rate. The higher the flow rate measured, the earlier the valve is closed (and vice versa).
  The calculation takes into account the drip correction quantity ("Drip correction quantity" parameter) and the mean flow rate for the time period specified ("Flow rate averaging" parameter) to determine the overall flow-to-drip ratio.
  Use this setting if process conditions show significant variability.
- **Time-controlled** option
  The valve shut-off time is adjusted based on the actual fill quantity and filling time recorded for the number of batches specified ("Batch averaging" parameter).
  A calculation is performed to determine the mean value for the fill quantity-to-time ratio (PT1 element), which is used to calculate the expected filling time for the specified fill quantity ("Fill quantity" parameter).
  Use this setting if the signal is very noisy, but process conditions are stable.

Drip median filter

Navigation Application → Batching → Configuration → Batch profile 1 to n → Drip med. filt.

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

The **Off** option is not selected in the **Drip measurement mode** parameter (→ 18).

Description Select the drip median filter depth, e.g. "Median 5" to determine the median drip quantity for the last 5 batches. The resulting value is used to determine the mean drip quantity as specified in the "Average drip correction quantity" parameter.

Selection
- Off
- Median 3
- Median 5
- Median 7

Average drip correction quantity

Navigation Application → Batching → Configuration → Batch profile 1 to n → Avg drip correc

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

The **Off** option is not selected in the **Drip measurement mode** parameter (→ 18).

Description Enter the number of batches to use to determine the mean drip quantity (moving average). The result is the drip correction quantity for the next batch.

The averaging operation is performed by means of a proportional transmission behavior with first order delay (PT1 element). Before the calculation is performed, the drip quantities are processed by the drip median filter ("Drip median filter" parameter).

Until the data required is available after commissioning the device, the calculation is performed using the drip correction quantity set up for the initial batch.

User entry 1 to 100

Batch averaging

Navigation Application → Batching → Configuration → Batch profile 1 to n → Batch averaging

Prerequisite The **Time-controlled** option is selected in the **Drip correction mode** parameter (→ 68).

Description Enter the number of batches to use in the calculation to determine the mean fill quantity-to-time ratio.

User entry 1 to 1000

Flow rate averaging

Navigation Application → Batching → Configuration → Batch profile 1 to n → Flow averaging

Prerequisite The **Dynamic** option is selected in the **Drip correction mode** parameter (→ 68).

Description Enter the time period over which to calculate the mean flow rate.

User entry Positive floating-point number

Batch stages

Navigation Application → Batching → Configuration → Batch profile 1 to n → Batch stages

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

Description Select the number of process stages.

Selection
- One-stage
- Two-stage
- One-stage and blow out

Additional information *Selection*
- **One-stage** option
  Only one valve is used.
- **Two-stage** option
  Two valves are used. The first valve opens at the start of the batch process and closes when the fill quantity is reached. The second valve opens when the start quantity specified ("Stage 2 start" parameter) is reached and closes when the stop quantity specified ("Stage 2 stop" parameter) is reached.
- **One-stage and blow out** option
  Two valves are used. The second valve is the blowout valve.

Stage 2 start

Navigation Application → Batching → Configuration → Batch profile 1 to n → Stage 2 start

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

The **Two-stage** option is selected in the **Batch stages** parameter (→ 70).

Description Enter the start quantity for opening the second valve as a % of the total fill quantity ("Fill quantity" parameter).

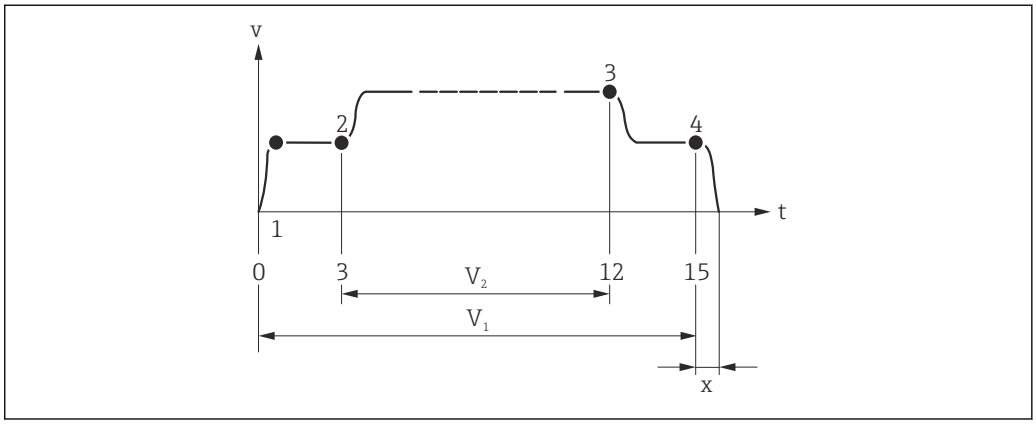
User entry 0 to 100 %

Additional information Example:

Total fill quantity: 15 kg

Start quantity, stage 2: 3kg = 20% of the total fill quantity

Stop quantity, stage 2: 12kg = 80% of the total fill quantity



v Flow velocity [m/s]
t Time
V_1 Valve 1 open
V_2 Valve 2 open
1 Valve 1 opens: start batching
2 Valve 2 opens: start rough batching
3 Valve 2 closes: rough batching quantity reached
4 Valve 1 closes: end of batching
x Drip quantity

Stage 2 stop

Navigation Application → Batching → Configuration → Batch profile 1 to n → Stage 2 stop

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).
The **Two-stage** option is selected in the **Batch stages** parameter (→ 70).

Description Enter the stop quantity for the closing of the second valve in % of total fill quantity ("Fill quantity" parameter).

User entry 0 to 100 %

Blowout delay

Navigation Application → Batching → Configuration → Batch profile 1 to n → Blowout delay

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).
The **One-stage and blow out** option is selected in the **Batch stages** parameter (→ 70).

Description If required, enter a delay before the blowout valve opens after the first valve has closed.

User entry 0 to 100 s

Blowout duration

Navigation Application → Batching → Configuration → Batch profile 1 to n → Blowout durat.

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).
The **One-stage and blow out** option is selected in the **Batch stages** parameter (→ 70).

Description Specify the blowout duration.

User entry 0 to 100 s

Maximum batch time

Navigation Application → Batching → Configuration → Batch profile 1 to n → Max. batch time

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

Description Enter the maximum filling time.
If the maximum filling time elapses before the valve shut-off point is reached, the filling procedure is terminated and a diagnostic message is generated. Drip is not measured and no new drip correction quantity is calculated. The diagnostic message remains active until the next batch is started.

User entry Positive floating-point number

Maximum flow rate

Navigation Application → Batching → Configuration → Batch profile 1 to n → Max. flow rate

Prerequisite A process variable is selected in the **Assign process variable** parameter (→ 17).

Description Enter the maximum flow rate. If the maximum flow rate is exceeded, a diagnostic message is generated.

User entry Signed floating-point number

Drip correction quantity

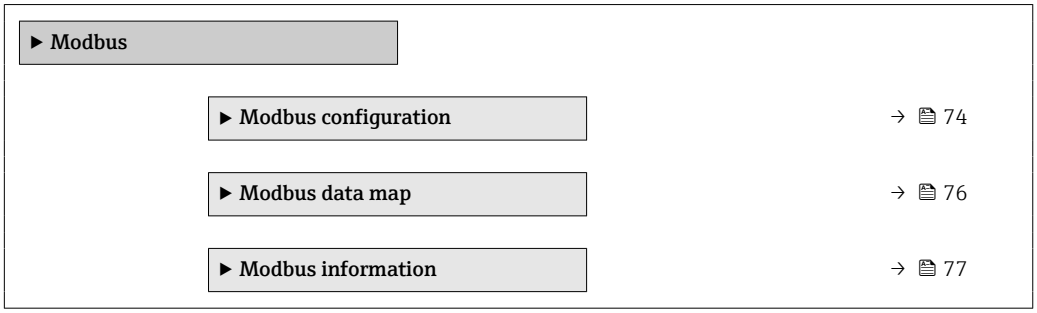
Navigation Application → Batching → Configuration → Batch profile 1 to n → Drip corr. qty

Description Displays the drip correction quantity that will apply for the next batch, provided this is the profile currently in operation ("Batch profile" parameter). When switching to a different profile, this parameter stores the last drip correction quantity calculated for the profile.

User interface	0 to 100 000 l

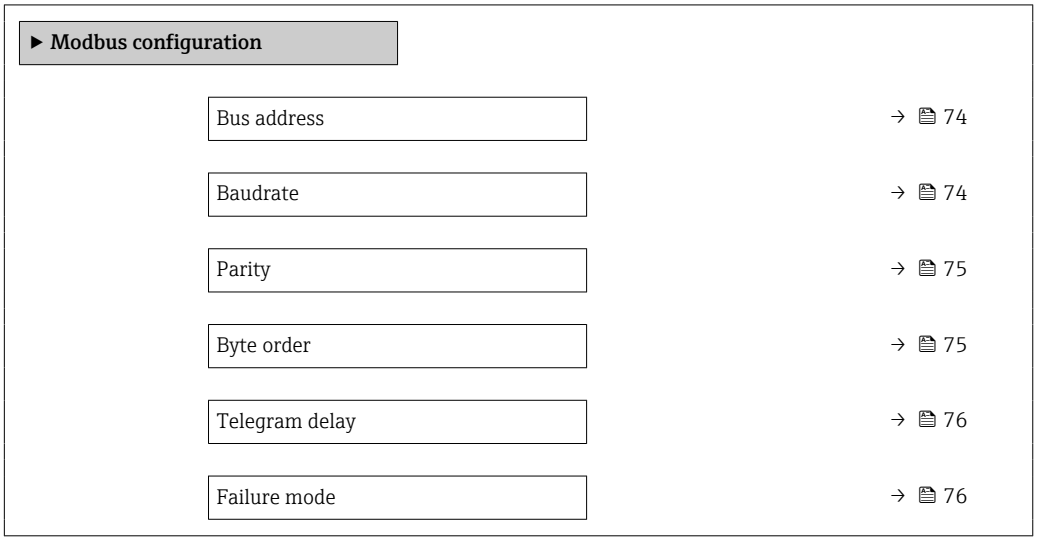
4.8 Modbus

Navigation Application → Modbus



4.8.1 Modbus configuration

Navigation Application → Modbus → Modbus config.



Bus address

Navigation Application → Modbus → Modbus config. → Bus address

Description Enter the device address.

User entry 1 to 247

Baudrate

Navigation Application → Modbus → Modbus config. → Baudrate

Description Specify the data transfer speed.

Selection
- 1200 BAUD
- 2400 BAUD
- 4800 BAUD
- 9600 BAUD
- 19200 BAUD
- 38400 BAUD
- 57600 BAUD
- 115200 BAUD
- 230400 BAUD

Parity

Navigation Application → Modbus → Modbus config. → Parity

Description

Specify the parity check method.

0 = "Even" option
1 = "Odd" option
2 = "None / 1 stop bit" option
3 = "None / 2 stop bits" option

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

Byte order

Navigation Application → Modbus → Modbus config. → Byte order

Description

Select the byte transmission sequence. The transmission sequence must match with the Modbus master.

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, data will not be exchanged correctly.

Changing the byte sequence in the host system often requires extensive knowledge and a significant amount of coding. Therefore, it is recommended in the event of inaccurate data transmission that the byte sequence specified for the measuring device be modified first to try to match it with the host system's. If it is not possible to facilitate the correct exchange of data in this manner, 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 → Modbus → Modbus config. → Telegram delay

Description Enter a delay before the measuring device responds to a request message from the Modbus master. Use this setting to regulate communication with slow Modbus RS485 masters.

User entry 0 to 100 ms

Failure mode

Navigation Application → Modbus → Modbus config. → Failure mode

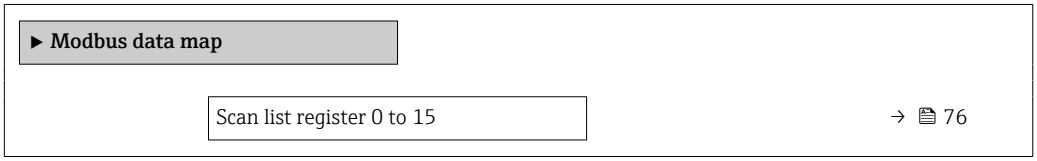
Description Specify the value reported via Modbus communication in the event of a device alarm.

Selection
- NaN value
- Last valid value

Additional information *Selection*
- **NaN value** option
  The NaN value is reported ("Not a number" value).
- **Last valid value** option
  The last valid value before the issue occurred is reported.

4.8.2 Modbus data map

Navigation Application → Modbus → Modbus data map



Scan list register 0 to 15

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

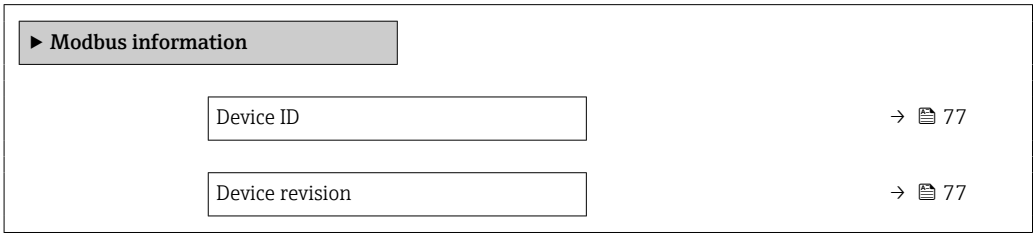
Description Enter the scan list register.

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 for the device parameters assigned is read out via the register addresses 5051 to 5081.

User entry 0 to 65 535

4.8.3 Modbus information

Navigation Application → Modbus → Modbus info



Device ID

Navigation Application → Modbus → Modbus info → Device ID

Description Displays the device ID to identify the measuring device.

User interface 0 to 65 535

Device revision

Navigation Application → Modbus → Modbus info → Device revision

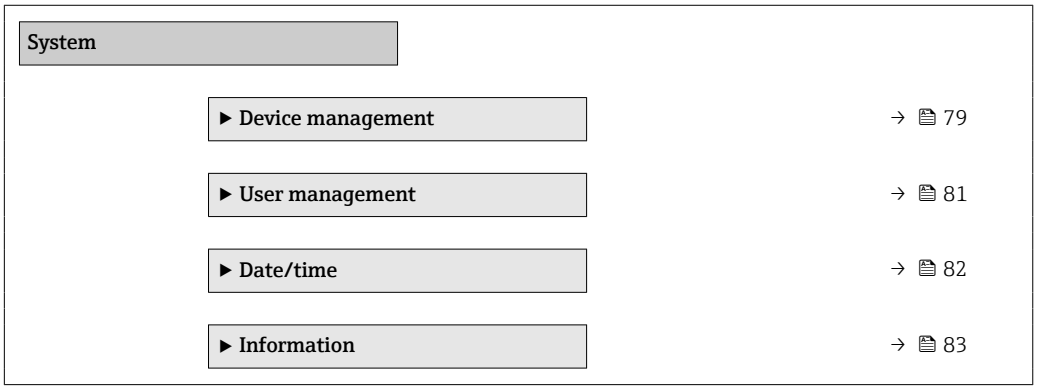
Description Displays device revision.

User interface 0 to 65 535

5 "System" menu

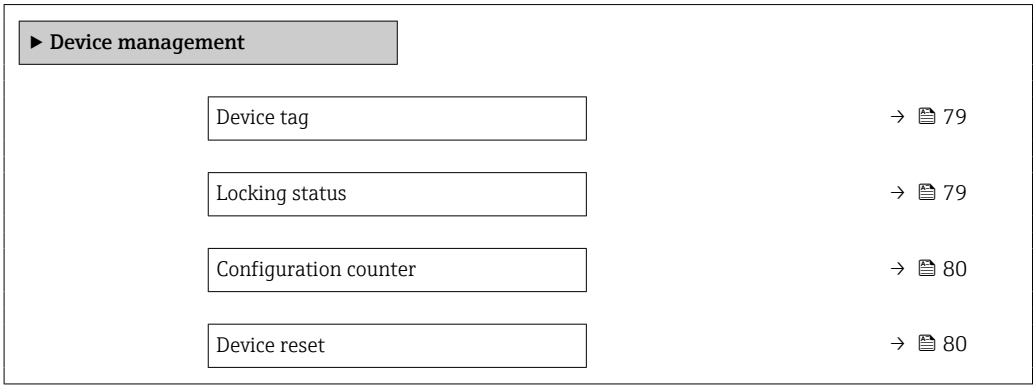
Overall device management and security settings – management of system settings and adaption to operational requirements.

Navigation System



5.1 Device management

Navigation System → Device manag.



Device tag

Navigation System → Device manag. → Device tag

Description Enter a unique designation for the measuring point to be able to easily identify it 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 Temporarily locked

Additional information *User interface*

"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 the number of times the device configuration has changed.

If the value for a static parameter changes, the counter increments by 1. This is to enable tracking different parameter versions.

When multiple parameters are changed simultaneously, e.g. when loading a configuration file into the device from an external source such as FieldCare, the counter may increment.

The counter cannot be reset. Nor is it reset to a default value on performing a device reset. Once the counter has incremented to 65535, it restarts at 1.

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 *
- Create T-DAT backup
- Restore T-DAT backup *

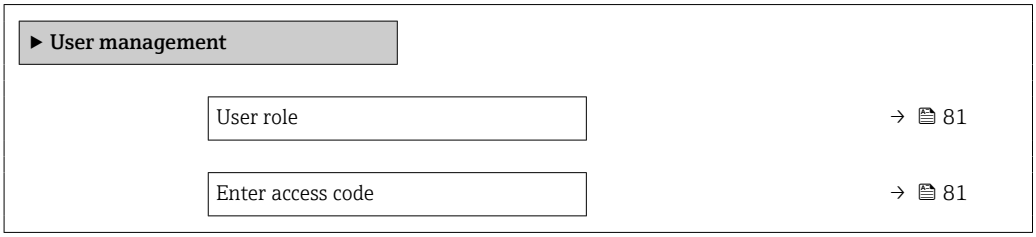
Additional information *Selection*

- **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.
- **Restore S-DAT backup** option
  Restores the data that is saved on the S-DAT.
  This function can be used to resolve the memory issue "083 Memory content inconsistent" or to restore the S-DAT data when a new S-DAT has been installed.
- **Create T-DAT backup** option
  Creates T-DAT backup.
- **Restore T-DAT backup** option
  Restores the data saved on the T-DAT.
  This function can be used to resolve the memory issue "283 Memory content inconsistent" or to restore the T-DAT data when a new T-DAT has been installed.

* Visibility depends on order options or device settings

5.2 User management

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. 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.
  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

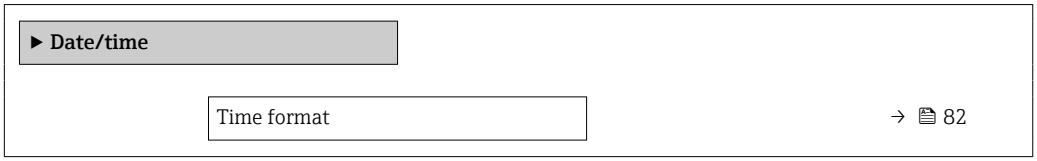
Navigation System → User manag. → Ent. access code

Description Use this function to enter the user-specific release code to remove parameter write protection.

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

5.3 Date/time

Navigation System → Date/time



Time format

Navigation System → Date/time → Time format

Description Select the time format.

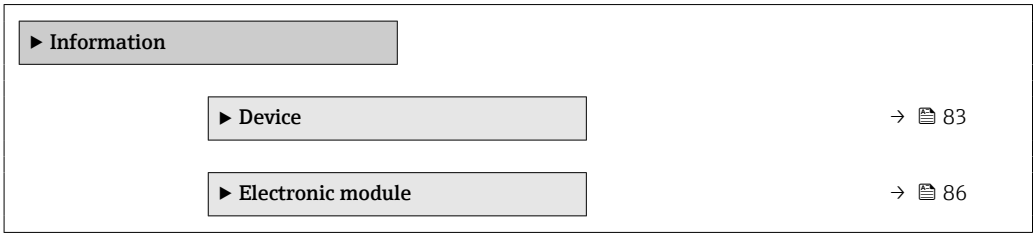
Selection
- 24 h
- 12 h AM/PM

Additional information *Selection*

For an explanation of the abbreviated units: → 89

5.4 Information

Navigation System → Information



5.4.1 Device

Navigation System → Information → Device

Device name

Navigation System → Information → Device → Device name

Description Displays the name of the transmitter. The transmitter name is also provided on the nameplate of the transmitter.

User interface Character string comprising numbers, letters and special characters

Device tag

Navigation System → Information → Device → Device tag

Description Enter a unique designation for the measuring point to be able to easily identify it within the plant.

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

Serial number

Navigation System → Information → Device → Serial number

Description Displays the serial number of the measuring device. The serial number is also provided on the nameplate of the sensor and of the transmitter.

The serial number can also be used to retrieve further device-related information and documentation via the Operations app or the Device Viewer on the Endress+Hauser website.

User interface Character string comprising numbers, letters and special characters

Order code

Navigation System → Information → Device → Order code

Description Displays the device order code.

The order code is 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

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

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.

The extended order code can also be found on the nameplate.

User interface Character string comprising numbers, letters and special characters

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.

The extended order code can also be found on the nameplate.

User interface Character string comprising numbers, letters and special characters

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.

The extended order code can also be found on the nameplate.

User interface Character string comprising numbers, letters and special characters

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

Manufacturer

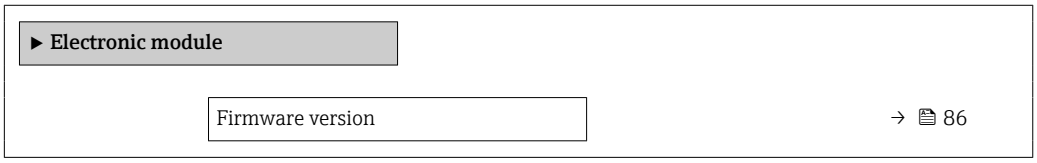
Navigation System → Information → Device → Manufacturer

Description Displays the manufacturer.

User interface Character string comprising numbers, letters and special characters

5.4.2 Electronic module

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

6 Country-specific factory settings

6.1 SI units

Not valid for USA and Canada.

6.1.1 System units

Mass	g
Mass flow	g/s
Volume	ml
Volume flow	ml/s
Density	kg/l
Temperature	°C

6.1.2 Switch-on point low flow cut off

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

Nominal diameter [mm]	On-value low flow cut off for liquid [g/s]
1	0.25
2	0.5
4	1
8	2
15	7
25	20
40	50

6.2 US units

Only valid for USA and Canada.

6.2.1 System units

Mass	oz
Mass flow	oz/s
Volume	fl oz (us)
Volume flow	fl oz/s (us)
Density	g/cm³
Temperature	°F

6.2.2 Switch-on point low flow cut off

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

Nominal diameter [in]	On-value for liquid [oz/s]
1/24	0.01
1/12	0.02
1/8	0.04
3/8	0.08
1/2	0.25
1	0.7
1 1/2	1.7

7 Explanation of abbreviated units

7.1 SI units

Process variable	Units	Explanation
	g/cm³, g/m³	Gram/volume unit
	kg/dm³, kg/l, kg/m³	Kilogram/volume unit
	SD4°C, SD15°C, SD20°C	Specific density: The specific density is the ratio of the density of the fluid to the density of water at a water temperature of 4 °C (39 °F), 15 °C (59 °F), 20 °C (68 °F).
	SG4°C, SG15°C, SG20°C	Specific gravity: The specific gravity is the ratio of the density of the fluid to the density of water at a water temperature of 4 °C (39 °F), 15 °C (59 °F), 20 °C (68 °F).
Pressure	Pa a, kPa a, MPa a	Pascal, kilopascal, megapascal (absolute)
	bar	Bar
	Pa g, kPa g, MPa g	Pascal, kilopascal, megapascal (relative/gauge)
	bar g	Bar (relative/gauge)
Mass	g, kg, t	Gram, kilogram, metric ton
	g/s, g/min, g/h, g/d	Gram/time unit
	kg/s, kg/min, kg/h, kg/d	Kilogram/time unit
	t/s, t/min, t/h, t/d	Metric ton/time unit
	kg/Nm³, kg/Nl, g/Scm³, kg/Sm³	Kilogram, gram/standard volume unit
Corrected volume	Nl, Nm³, Sm³	Normal liter, normal cubic meter, standard cubic meter
	Nl/s, Nl/min, Nl/h, Nl/d	Normal liter/time unit
	Nm³/s, Nm³/min, Nm³/h, Nm³/d	Normal cubic meter/time unit
	Sm³/s, Sm³/min, Sm³/h, Sm³/d	Standard cubic meter/time unit
	°C , K	Celsius, Kelvin
Time	s, m, h, d, y	Second, minute, hour, day, year

7.2 US units

Process variable	Units	Explanation
	lb/ft³, lb/gal (us)	Pound/cubic foot, pound/gallon
	lb/bbl (us;liq.), lb/bbl (us;beer), lb/bbl (us;oil), lb/bbl (us;tank)	Pound/volume unit
Pressure	psi a	Pounds per square inch (absolute)
	psi g	Pounds per square inch (gauge)
Mass	oz, lb, STon	Ounce, pound, standard ton
	oz/s, oz/min, oz/h, oz/d	Ounce/time unit
	lb/s, lb/min, lb/h, lb/d	Pound/time unit
	STon/s, STon/min, STon/h, STon/d	Standard ton/time unit
	lb/Sft³	Weight unit/standard volume unit
Corrected volume	Sft³, Sgal (us), Sbbl (us;liq.)	Standard cubic foot, standard gallon, standard barrel
	Sft³/s, Sft³/min, Sft³/h, Sft³/d	Standard cubic foot/time unit

Process variable	Units	Explanation
	Sgal/s (us), Sgal/min (us), Sgal/h (us), Sgal/d (us)	Standard gallon/time unit
	Sbbl/s (us;liq.), Sbbl/min (us;liq.), Sbbl/h (us;liq.), Sbbl/d (us;liq.)	Barrel/time unit (normal liquids)
	°F, °R	Fahrenheit, Rankine
Volume	af	Acre foot
	ft^3	Cubic foot
	fl oz (us), gal (us), kgal (us), Mgal (us)	Fluid ounce, gallon, kilogallon, million gallon
	bbl (us;liq.), bbl (us;beer), bbl (us;oil), bbl (us;tank)	Barrel (normal liquids), barrel (beer), barrel (petrochemicals), barrel (filling tanks)
	af/s, af/min, af/h, af/d	Acre foot/time unit
	ft^3/s, ft^3/min, ft^3/h, ft^3/d	Cubic foot/time unit
	fl oz/s (us), fl oz/min (us), fl oz/h (us), fl oz/d (us)	Fluid ounce/time unit
	gal/s (us), gal/min (us), gal/h (us), gal/d (us)	Gallon/time unit
	kgal/s (us), kgal/min (us), kgal/h (us), kgal/d (us)	Kilogallon/time unit
	Mgal/s (us), Mgal/min (us), Mgal/h (us), Mgal/d (us)	Million gallon/time unit
	bbl/s (us;liq.), bbl/min (us;liq.), bbl/h (us;liq.), bbl/d (us;liq.)	Barrel/time unit (normal liquids) Normal liquids: 31.5 gal/bbl
	bbl/s (us;beer), bbl/min (us;beer), bbl/h (us;beer), bbl/d (us;beer)	Barrel /time unit (beer) Beer: 31.0 gal/bbl
	bbl/s (us;oil), bbl/min (us;oil), bbl/h (us;oil), bbl/d (us;oil)	Barrel/time unit (petrochemicals) Petrochemicals: 42.0 gal/bbl
	bbl/s (us;tank), bbl/min (us;tank), bbl/h (us;tank), bbl/d (us;tank)	Barrel/time unit (filling tank) Filling tanks: 55.0 gal/bbl
Time	s, m, h, d, y	Second, minute, hour, day, year
	am, pm	Ante meridiem (before midday), post meridiem (after midday)

7.3 Imperial units

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

Process variable	Units	Explanation
	bbl/s (imp;beer), bbl/min (imp;beer), bbl/h (imp;beer), bbl/d (imp;beer)	Barrel /time unit (beer) Beer: 36.0 gal/bbl
	bbl/s (imp;oil), bbl/min (imp;oil), bbl/h (imp;oil), bbl/d (imp;oil)	Barrel/time unit (petrochemicals) Petrochemicals: 34.97 gal/bbl
Time	s, m, h, d, y	Second, minute, hour, day, year
	am, pm	Ante meridiem (before midday), post meridiem (after midday)

8 Modbus RS485 register information

8.1 Notes

8.1.1 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	**Selection** 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 **Input** 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.

8.1.2 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:

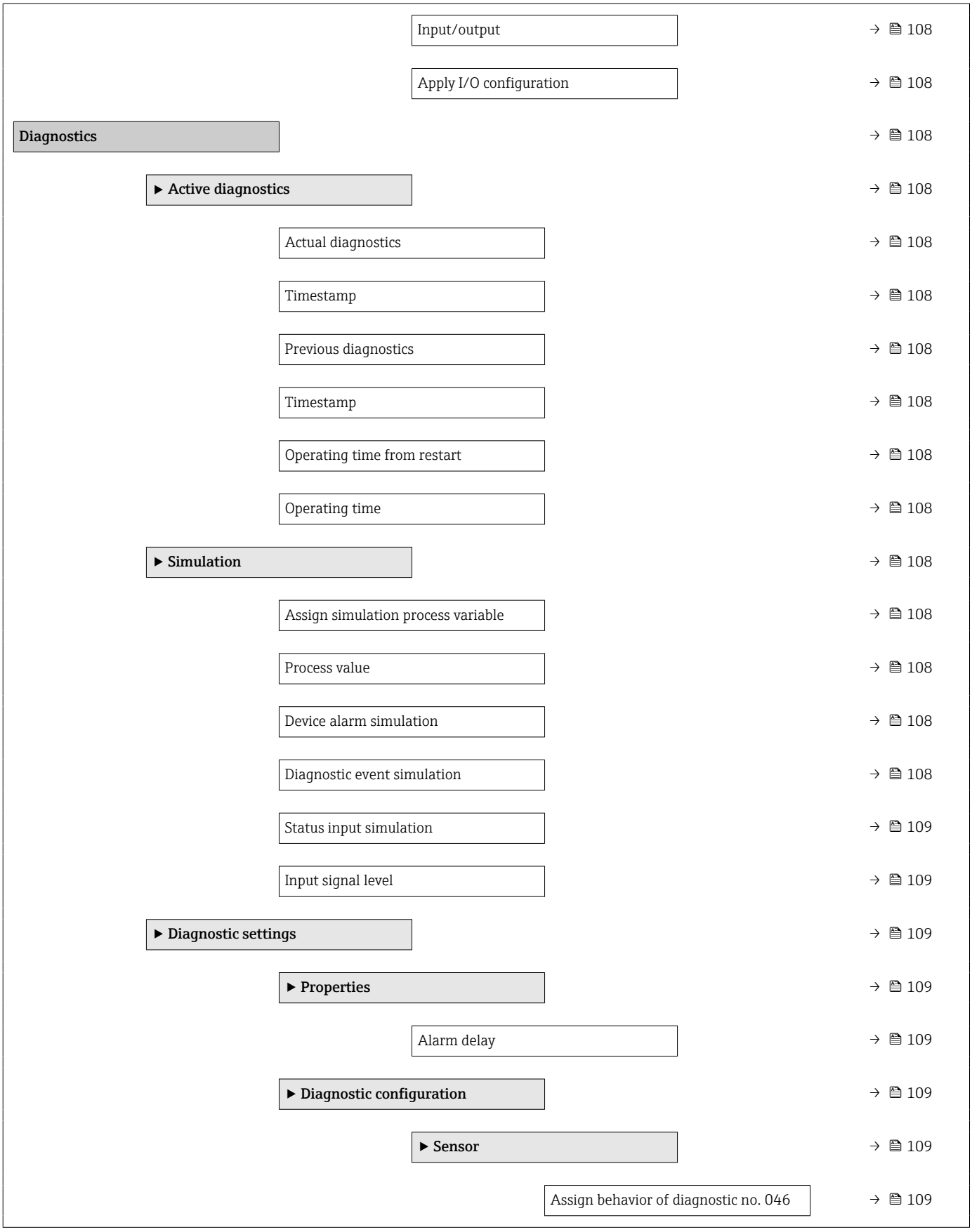
- "3" → "Read" access
- "4" → "Write" access

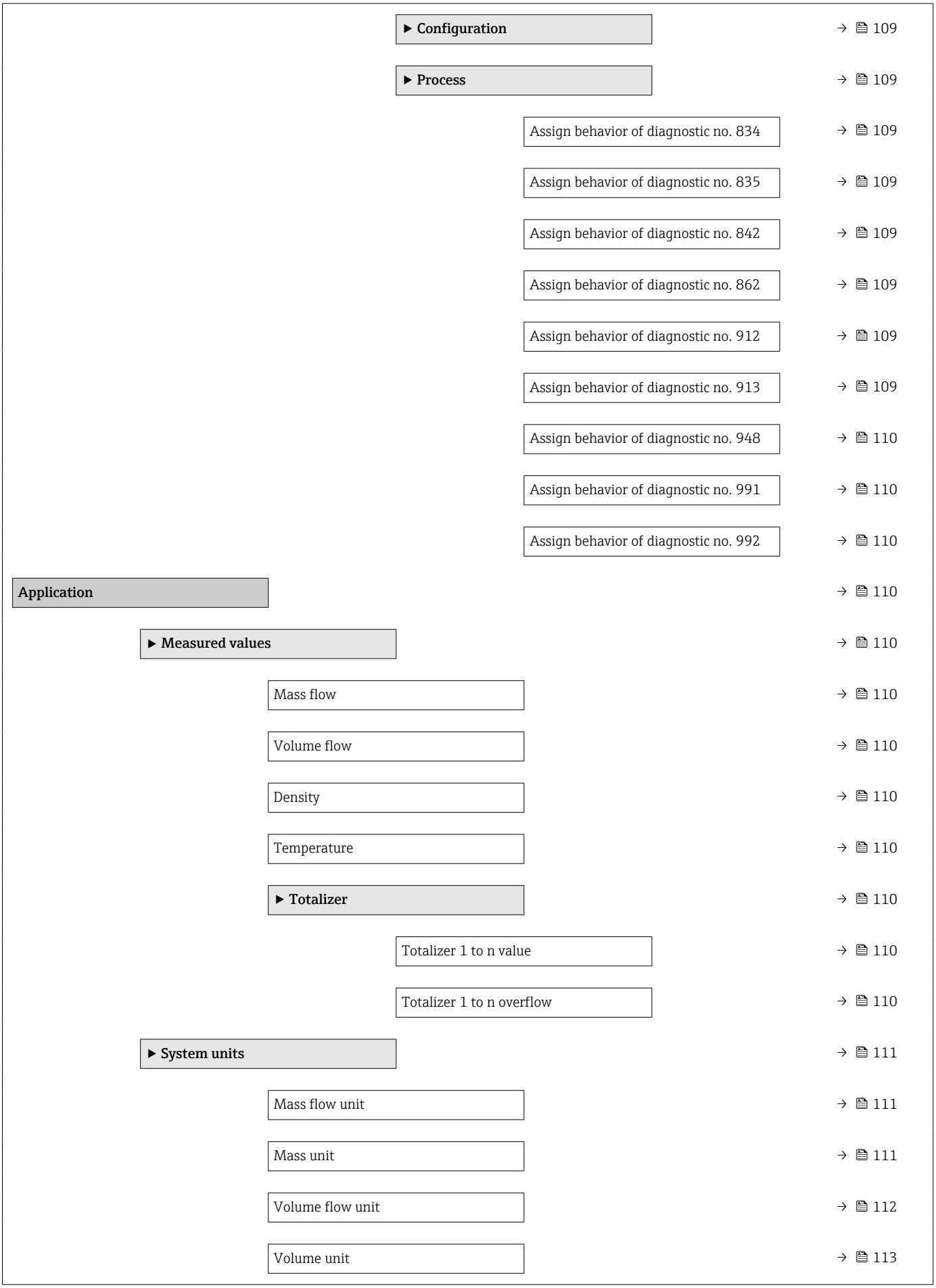
Function code	Access type	Register in accordance with "Modbus Applications Protocol Specification"	Register in accordance with "Modicon Modbus Protocol Reference Guide"
03 04 23	Read	XXXX Example: mass flow = 2007	3XXXX Example: mass flow = 32007
06 16 23	Write	XXXX Example: reset totalizer = 6401	4XXXX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

8.2 Overview of the operating menu

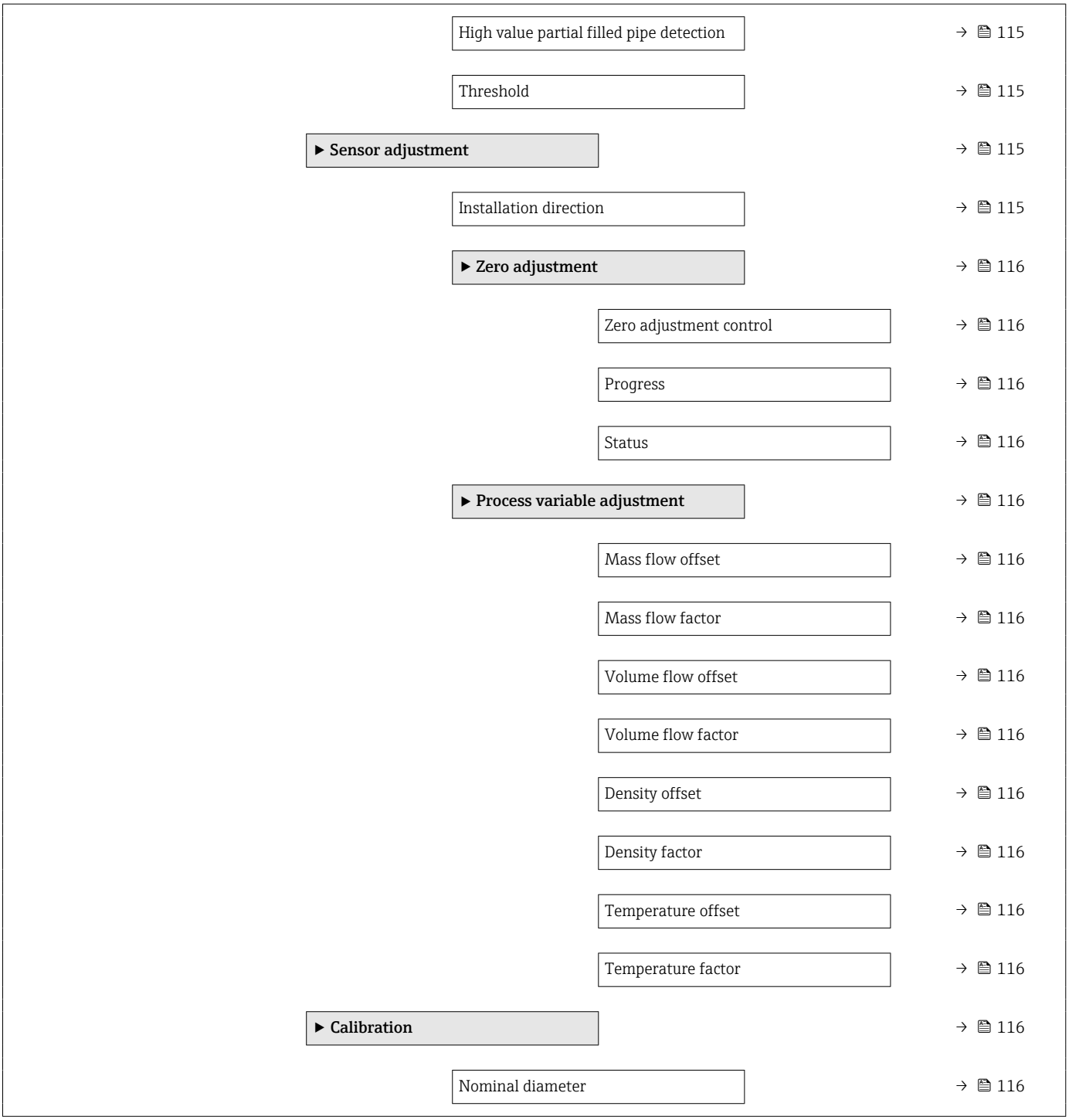
The following table provides an overview of the menu structure of the operating menu and its parameters. The page reference indicates where the associated description of the submenu or parameter can be found.

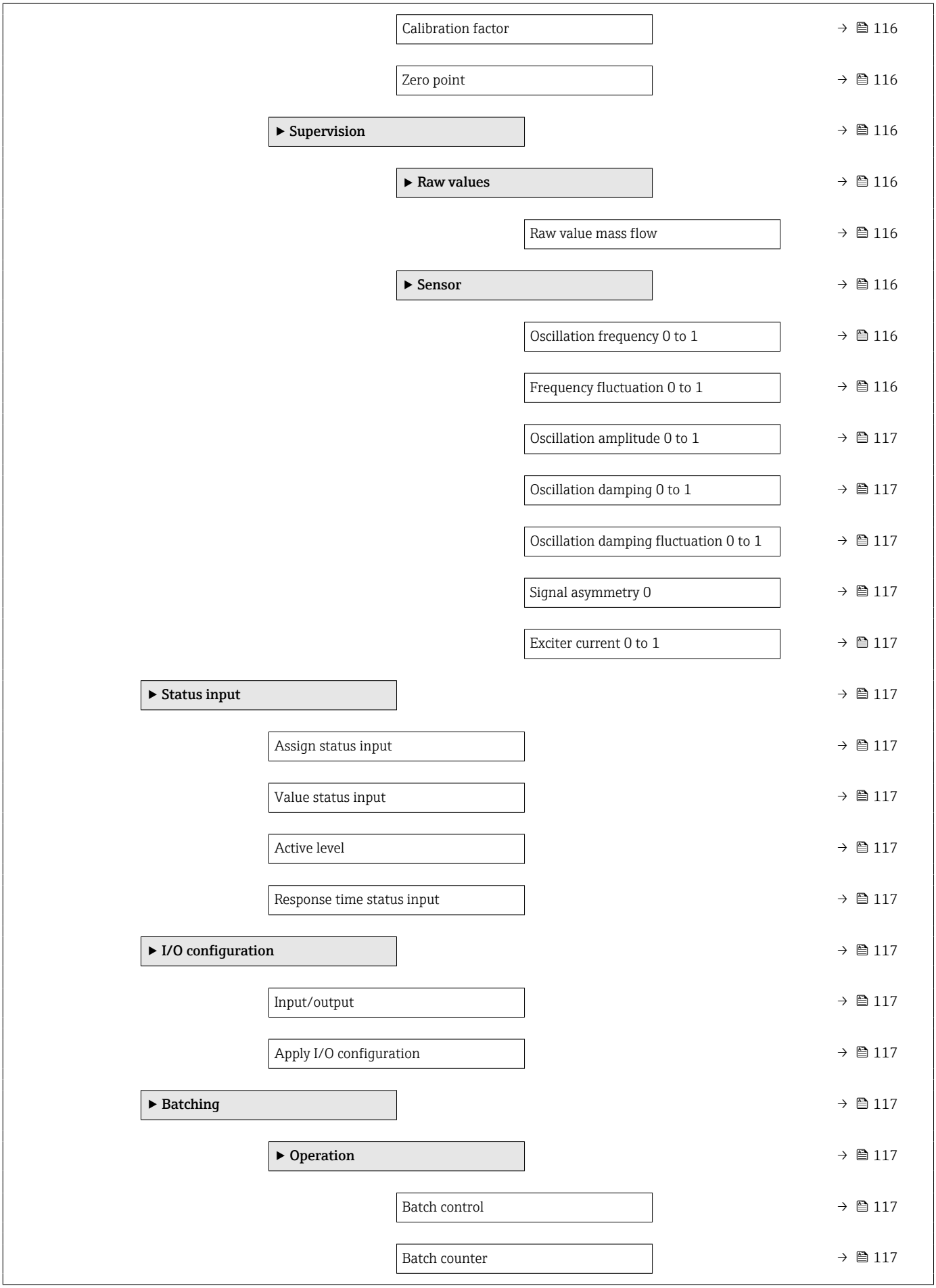
Totalizer 1 to n operation mode	→ 106
Totalizer 1 to n failure behavior	→ 106
▶ **Process**	→ 106
Flow damping	→ 106
Low flow cutoff	→ 106
On value low flow cutoff	→ 106
Off value low flow cutoff	→ 106
Partially filled pipe detection	→ 106
Low value partial filled pipe detection	→ 107
High value partial filled pipe detection	→ 107
▶ **Status input**	→ 107
Assign status input	→ 107
Active level	→ 107
Response time status input	→ 107
▶ **Batch profile**	→ 107
Assign process variable	→ 107
Batch unit	→ 107
Fill quantity	→ 107
Drip measurement mode	→ 107
▶ **Switch output**	→ 107
Switch output function 1	→ 107
▶ **Time format**	→ 108
Time format	→ 108
▶ **I/O configuration**	→ 108


Input/output → 108
Apply I/O configuration → 108
Diagnostics → 108
▶ Active diagnostics → 108
Actual diagnostics → 108
Timestamp → 108
Previous diagnostics → 108
Timestamp → 108
Operating time from restart → 108
Operating time → 108
▶ Simulation → 108
Assign simulation process variable → 108
Process value → 108
Device alarm simulation → 108
Diagnostic event simulation → 108
Status input simulation → 109
Input signal level → 109
▶ Diagnostic settings → 109
▶ Properties → 109
Alarm delay → 109
▶ Diagnostic configuration → 109
▶ Sensor → 109
Assign behavior of diagnostic no. 046 → 109

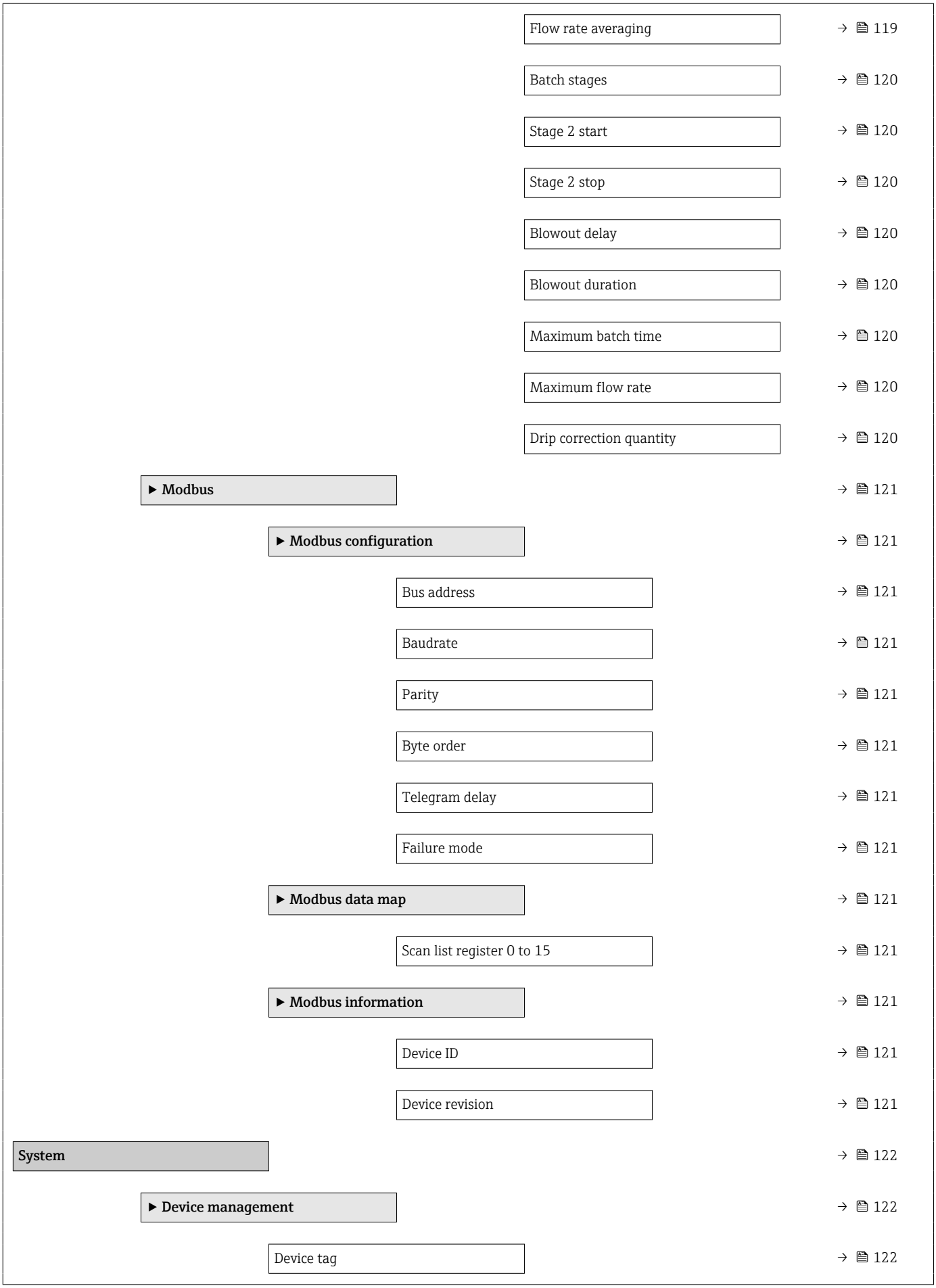

▶ Configuration → 109
▶ Process → 109
Assign behavior of diagnostic no. 834 → 109
Assign behavior of diagnostic no. 835 → 109
Assign behavior of diagnostic no. 842 → 109
Assign behavior of diagnostic no. 862 → 109
Assign behavior of diagnostic no. 912 → 109
Assign behavior of diagnostic no. 913 → 109
Assign behavior of diagnostic no. 948 → 110
Assign behavior of diagnostic no. 991 → 110
Assign behavior of diagnostic no. 992 → 110
Application → 110
▶ Measured values → 110
Mass flow → 110
Volume flow → 110
Density → 110
Temperature → 110
▶ Totalizer → 110
Totalizer 1 to n value → 110
Totalizer 1 to n overflow → 110
▶ System units → 111
Mass flow unit → 111
Mass unit → 111
Volume flow unit → 112
Volume unit → 113

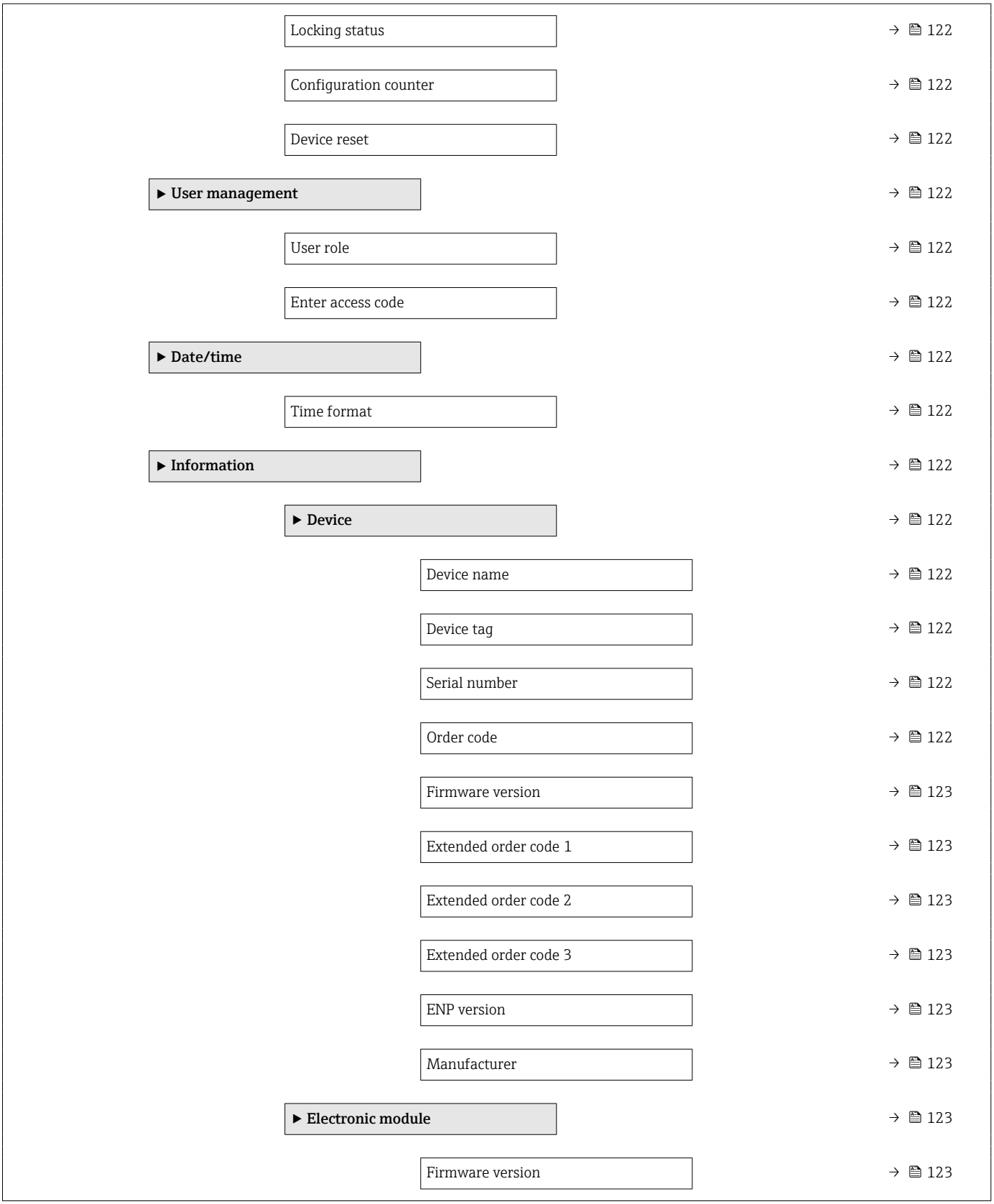
- Density unit → 113
- Temperature unit → 113
- ▶ **Totalizers** → 114
  - ▶ **Totalizer handling** → 114
    - Reset all totalizers → 114
  - ▶ **Totalizer 1 to n** → 114
    - Assign process variable 1 to n → 114
    - Process variable unit 1 to n → 114
    - Totalizer 1 to n operation mode → 114
    - Totalizer 1 to n control → 114
    - Preset value 1 to n → 114
    - Totalizer 1 to n failure behavior → 114
- ▶ **Sensor** → 115
  - ▶ **Process parameters** → 115
    - Flow damping → 115
    - Flow override → 115
    - Density damping → 115
    - Temperature damping → 115
  - ▶ **Low flow cutoff** → 115
    - Low flow cutoff → 115
    - On value low flow cutoff → 115
    - Off value low flow cutoff → 115
  - ▶ **Partially filled pipe detection** → 115
    - Partially filled pipe detection → 115
    - Low value partial filled pipe detection → 115


High value partial filled pipe detection → 115
Threshold → 115
▶ Sensor adjustment → 115
Installation direction → 115
▶ Zero adjustment → 116
Zero adjustment control → 116
Progress → 116
Status → 116
▶ Process variable adjustment → 116
Mass flow offset → 116
Mass flow factor → 116
Volume flow offset → 116
Volume flow factor → 116
Density offset → 116
Density factor → 116
Temperature offset → 116
Temperature factor → 116
▶ Calibration → 116
Nominal diameter → 116


Calibration factor → 116
Zero point → 116
▶ Supervision → 116
▶ Raw values → 116
Raw value mass flow → 116
▶ Sensor → 116
Oscillation frequency 0 to 1 → 116
Frequency fluctuation 0 to 1 → 116
Oscillation amplitude 0 to 1 → 117
Oscillation damping 0 to 1 → 117
Oscillation damping fluctuation 0 to 1 → 117
Signal asymmetry 0 → 117
Exciter current 0 to 1 → 117
▶ Status input → 117
Assign status input → 117
Value status input → 117
Active level → 117
Response time status input → 117
▶ I/O configuration → 117
Input/output → 117
Apply I/O configuration → 117
▶ Batching → 117
▶ Operation → 117
Batch control → 117
Batch counter → 117

- Last fill quantity → 117
- Last drip quantity → 117
- Last filling time → 118
- Last close time → 118
- Drip correction quantity → 118
- Batch totalizer → 118
- Totalizer overflow → 118
- Batch unit → 118
- Switch output function 1 → 118
- Switch state 1 → 118
- Switch output function 2 → 118
- Switch state 2 → 118
- Batch profile → 118
- **► Configuration** → 118
  - **► Batch profile 1 to n settings** → 118
    - Assign process variable → 118
    - Batch unit → 118
    - Fill quantity → 119
    - Measuring time drip quantity → 119
    - Fixed correction quantity → 119
    - Drip measurement mode → 119
    - Drip correction mode → 119
    - Drip median filter → 119
    - Average drip correction quantity → 119
    - Batch averaging → 119


Flow rate averaging → 119
Batch stages → 120
Stage 2 start → 120
Stage 2 stop → 120
Blowout delay → 120
Blowout duration → 120
Maximum batch time → 120
Maximum flow rate → 120
Drip correction quantity → 120
▶ Modbus → 121
▶ Modbus configuration → 121
Bus address → 121
Baudrate → 121
Parity → 121
Byte order → 121
Telegram delay → 121
Failure mode → 121
▶ Modbus data map → 121
Scan list register 0 to 15 → 121
▶ Modbus information → 121
Device ID → 121
Device revision → 121
System → 122
▶ Device management → 122
Device tag → 122


Locking status → 122
Configuration counter → 122
Device reset → 122
▶ User management → 122
User role → 122
Enter access code → 122
▶ Date/time → 122
Time format → 122
▶ Information → 122
▶ Device → 122
Device name → 122
Device tag → 122
Serial number → 122
Order code → 122
Firmware version → 123
Extended order code 1 → 123
Extended order code 2 → 123
Extended order code 3 → 123
ENP version → 123
Manufacturer → 123
▶ Electronic module → 123
Firmware version → 123

8.3 Register information

8.3.1 "Guidance" menu

"Commissioning" wizard

"Device identification" wizard

Navigation: Guidance → Commissioning → Device identification					
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	7
Firmware version	7277 to 7280	String	Read	Character string comprising numbers, letters and special characters	7
Device name	7263 to 7270	String	Read	Character string comprising numbers, letters and special characters	7

"System units" wizard

Navigation: Guidance → Commissioning → System units					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Mass flow unit	2101	Integer	Read / Write	0 = g/s 1 = g/min 2 = g/h 3 = g/d 4 = kg/s 5 = kg/min 6 = kg/h 7 = kg/d 8 = t/s 9 = t/min 10 = t/h 11 = t/d 12 = oz/s 13 = oz/min 14 = oz/h 15 = oz/d 16 = lb/s 17 = lb/min 18 = lb/h 19 = lb/d 20 = STon/s 21 = STon/min 22 = STon/h 23 = STon/d	8
Mass unit	2102	Integer	Read / Write	2 = t 5 = STon 12 = g 13 = kg 14 = oz 15 = lb	8

Navigation: Guidance → Commissioning → 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) 69 = gal/min (imp) 70 = gal/h (imp)	8

Navigation: Guidance → Commissioning → System units					
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)	
Volume unit	2104	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)	9
Density unit	2107	Integer	Read / Write	0 = g/cm^3 2 = kg/dm^3 3 = kg/l 4 = kg/m^3 5 = SD4°C 6 = SD15°C 7 = SD20°C 8 = SG4°C 9 = SG15°C 10 = SG20°C 11 = lb/ft^3 12 = lb/gal (us) 13 = lb/bbl (us;liq.) 14 = lb/bbl (us;beer) 15 = lb/bbl (us;oil) 16 = lb/bbl (us;tank) 17 = lb/gal (imp) 18 = lb/bbl (imp;beer) 19 = lb/bbl (imp;oil) 21 = g/m^3 22 = g/ml	10
Temperature unit	2109	Integer	Read / Write	0 = °C 1 = K 2 = °F 3 = °R	10

"Totalizer 1 to n" wizard

Navigation: Guidance → Commissioning → Totalizer 1 to n					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Assign process variable 1 to n	1: 2601 2: 2801 3: 3001	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow	11
Process variable unit 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 * 50 = g * 51 = kg * 52 = t * 53 = oz * 54 = lb * 55 = STon * 111 = Mft^3 * 251 = None *	11
Totalizer 1 to n operation mode	1: 2605 2: 2805 3: 3005	Integer	Read / Write	0 = Net 1 = Forward 2 = Reverse	12
Totalizer 1 to n failure behavior	1: 2606 2: 2806 3: 3006	Integer	Read / Write	0 = Hold 1 = Continue 2 = Last valid value + continue	12

* Visibility depends on order options or device settings

"Process" wizard

Navigation: Guidance → Commissioning → Process					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Flow damping	35954 to 35955	Float	Read / Write	0 to 99.9 s	13
Low flow cutoff	5101	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow	13
On value low flow cutoff	5138 to 5139	Float	Read / Write	Positive floating-point number	14
Off value low flow cutoff	5104 to 5105	Float	Read / Write	0 to 100.0 %	14
Partially filled pipe detection	5106	Integer	Read / Write	0 = Off 4 = Density	14

Navigation: Guidance → Commissioning → Process					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Low value partial filled pipe detection	5110 to 5111	Float	Read / Write	Signed floating-point number	15
High value partial filled pipe detection	5112 to 5113	Float	Read / Write	Signed floating-point number	15

"Status input" wizard

Navigation: Guidance → Commissioning → Status input					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Assign status input	2506	Integer	Read / Write	0 = Off 1 = Flow override 2 = Reset all totalizers 3 = Reset totalizer 1 4 = Reset totalizer 2 5 = Reset totalizer 3 6 = Start batch 7 = Start & stop batch	15
Active level	2530	Integer	Read / Write	0 = Low 1 = High	16
Response time status input	3404 to 3405	Float	Read / Write	10 to 200 ms	16

"Batch profile" wizard

Navigation: Guidance → Commissioning → Batch profile					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Assign process variable	3580	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow	17
Batch unit	3530	Integer	Read / Write	0 = cm^3 * 1 = dm^3 * 3 = ml * 4 = l * 9 = ft^3 * 10 = fl oz (us) * 11 = gal (us) * 12 = g * 13 = kg * 14 = oz * 15 = lb *	17
Fill quantity	3586 to 3587	Float	Read / Write	Signed floating-point number	17
Drip measurement mode	3880	Integer	Read / Write	0 = Off 1 = Fixed time 2 = Fixed time or low flow cut off	18

* Visibility depends on order options or device settings

"Switch output" wizard

Navigation: Guidance → Commissioning → Switch output					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Switch output function 1	2488	Integer	Read / Write	0 = Batching 1 = Open 2 = Closed	19

"Time format" wizard

Navigation: Guidance → Commissioning → Time format					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Time format	2150	Integer	Read / Write	12 = 12 h AM/PM 24 = 24 h	19

"I/O configuration" wizard

Navigation: Guidance → Commissioning → I/O configuration					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Input/output	6417	Integer	Read / Write	0 = Off 1 = Batch status 5 = Status input 51 = Switch output 1 52 = Switch output 2	20
Apply I/O configuration	8665	Integer	Read / Write	0 = Yes 1 = No	20

8.3.2 "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	22
Timestamp	2719	String	Read	Days (d), hours (h), minutes (m), seconds (s)	22
Previous diagnostics	2734	Integer	Read	Positive integer	22
Timestamp	2068	String	Read	Days (d), hours (h), minutes (m), seconds (s)	23
Operating time from restart	2624	String	Read	Days (d), hours (h), minutes (m), seconds (s)	23
Operating time	2631	String	Read	Days (d), hours (h), minutes (m), seconds (s)	23

"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 = Mass flow 2 = Volume flow 4 = Density 7 = Temperature	24
Process value	6814 to 6815	Float	Read / Write	Signed floating-point number	24
Device alarm simulation	6812	Integer	Read / Write	0 = Off 1 = On	25
Diagnostic event simulation	4259	Integer	Read / Write	0 = Off	25

Navigation: Diagnostics → Simulation					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Status input simulation	2620	Integer	Read / Write	0 = Off 1 = On	25
Input signal level	2638	Integer	Read / Write	0 = Low 1 = High	25

"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	26

"Diagnostic configuration" submenu

"Sensor" submenu

Navigation: Diagnostics → Diagnostic settings → Diagnostic configuration → Sensor					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Assign behavior of diagnostic no. 046	27554	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	27

"Configuration" submenu

"Process" submenu

Navigation: Diagnostics → Diagnostic settings → Diagnostic configuration → Process					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Assign behavior of diagnostic no. 834	6438	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	28
Assign behavior of diagnostic no. 835	6437	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	28
Assign behavior of diagnostic no. 842	9661	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	29
Assign behavior of diagnostic no. 862	6441	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	29
Assign behavior of diagnostic no. 912	27552	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	30
Assign behavior of diagnostic no. 913	27551	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	30

Navigation: Diagnostics → Diagnostic settings → Diagnostic configuration → Process					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Assign behavior of diagnostic no. 948	27556	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	31
Assign behavior of diagnostic no. 991	36939	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	31
Assign behavior of diagnostic no. 992	52241	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	32

8.3.3 "Application" menu

"Measured values" submenu

Navigation: Application → Measured values					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Mass flow	2007 to 2008	Float	Read	Signed floating-point number	34
Volume flow	2009 to 2010	Float	Read	Signed floating-point number	34
Density	2013 to 2014	Float	Read	Positive floating-point number	34
Temperature	2017 to 2018	Float	Read	Positive floating-point number	34

"Totalizer" submenu

Navigation: Application → Measured values → Totalizer					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Totalizer 1 to n value	1: 2610 to 2611 2: 2810 to 2811 3: 3010 to 3011	Float	Read	Signed floating-point number	35
Totalizer 1 to n overflow	1: 2612 to 2613 2: 2812 to 2813 3: 3012 to 3013	Float	Read	−32 000.0 to 32 000.0	35

"System units" submenu

Navigation: Application → System units					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Mass flow unit	2101	Integer	Read / Write	0 = g/s 1 = g/min 2 = g/h 3 = g/d 4 = kg/s 5 = kg/min 6 = kg/h 7 = kg/d 8 = t/s 9 = t/min 10 = t/h 11 = t/d 12 = oz/s 13 = oz/min 14 = oz/h 15 = oz/d 16 = lb/s 17 = lb/min 18 = lb/h 19 = lb/d 20 = STon/s 21 = STon/min 22 = STon/h 23 = STon/d	36
Mass unit	2102	Integer	Read / Write	2 = t 5 = STon 12 = g 13 = kg 14 = oz 15 = lb	36

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) 69 = gal/min (imp) 70 = gal/h (imp)	37

Navigation: Application → System units					
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)	
Volume unit	2104	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)	38
Density unit	2107	Integer	Read / Write	0 = g/cm^3 2 = kg/dm^3 3 = kg/l 4 = kg/m^3 5 = SD4°C 6 = SD15°C 7 = SD20°C 8 = SG4°C 9 = SG15°C 10 = SG20°C 11 = lb/ft^3 12 = lb/gal (us) 13 = lb/bbl (us;liq.) 14 = lb/bbl (us;beer) 15 = lb/bbl (us;oil) 16 = lb/bbl (us;tank) 17 = lb/gal (imp) 18 = lb/bbl (imp;beer) 19 = lb/bbl (imp;oil) 21 = g/m^3 22 = g/ml	38
Temperature unit	2109	Integer	Read / Write	0 = °C 1 = K 2 = °F 3 = °R	39

"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	40

"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 to n	1: 2601 2: 2801 3: 3001	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow	41
Process variable unit 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 * 50 = g * 51 = kg * 52 = t * 53 = oz * 54 = lb * 55 = STon * 111 = Mft^3 * 251 = None *	41
Totalizer 1 to n operation mode	1: 2605 2: 2805 3: 3005	Integer	Read / Write	0 = Net 1 = Forward 2 = Reverse	42
Totalizer 1 to n control	1: 2608 2: 2808 3: 3008	Integer	Read / Write	0 = Totalize 1 = Reset + totalize 2 = Preset + hold 3 = Reset + hold 4 = Preset + totalize 5 = Hold	42
Preset value 1 to n	1: 2590 to 2591 2: 2592 to 2593 3: 2594 to 2595	Float	Read / Write	Signed floating-point number	43
Totalizer 1 to n failure behavior	1: 2606 2: 2806 3: 3006	Integer	Read / Write	0 = Hold 1 = Continue 2 = Last valid value + continue	43

* 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	35954 to 35955	Float	Read / Write	0 to 99.9 s	44
Flow override	5503	Integer	Read / Write	0 = Off 1 = On	45
Density damping	35956 to 35957	Float	Read / Write	0 to 999.9 s	45
Temperature damping	37236 to 37237	Float	Read / Write	0 to 999.9 s	45

"Low flow cutoff" submenu

Navigation: Application → Sensor → Low flow cutoff					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Low flow cutoff	5101	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow	46
On value low flow cutoff	5138 to 5139	Float	Read / Write	Positive floating-point number	47
Off value low flow cutoff	5104 to 5105	Float	Read / Write	0 to 100.0 %	47

"Partially filled pipe detection" submenu

Navigation: Application → Sensor → Partially filled pipe detection					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Partially filled pipe detection	5106	Integer	Read / Write	0 = Off 4 = Density	47
Low value partial filled pipe detection	5110 to 5111	Float	Read / Write	Signed floating-point number	48
High value partial filled pipe detection	5112 to 5113	Float	Read / Write	Signed floating-point number	48
Threshold	2414 to 2415	Float	Read / Write	Positive floating-point number	48

"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	49

"Zero adjustment" submenu

Navigation: Application → Sensor → Sensor adjustment → Zero adjustment					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Zero adjustment control	5121	Integer	Read / Write	0 = Cancel 1 = Start	49
Progress	6797	Integer	Read	0 to 100 %	50
Status	10237	Integer	Read	2 = Failed 5 = Done 8 = Busy	50

"Process variable adjustment" submenu

Navigation: Application → Sensor → Sensor adjustment → Process variable adjustment					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Mass flow offset	5521 to 5522	Float	Read / Write	Signed floating-point number	51
Mass flow factor	5519 to 5520	Float	Read / Write	Positive floating-point number	51
Volume flow offset	5525 to 5526	Float	Read / Write	Signed floating-point number	51
Volume flow factor	5523 to 5524	Float	Read / Write	Positive floating-point number	51
Density offset	5529 to 5530	Float	Read / Write	Signed floating-point number	52
Density factor	5527 to 5528	Float	Read / Write	Positive floating-point number	52
Temperature offset	5533 to 5534	Float	Read / Write	Signed floating-point number	52
Temperature factor	5531 to 5532	Float	Read / Write	Positive floating-point number	52

"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	53
Calibration factor	7513 to 7514	Float	Read	Signed floating-point number	53
Zero point	7527 to 7528	Float	Read / Write	Signed floating-point number	53

"Supervision" submenu

"Raw values" submenu

Navigation: Application → Sensor → Supervision → Raw values					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Raw value mass flow	10232 to 10233	Float	Read	Signed floating-point number	54

"Sensor" submenu

Navigation: Application → Sensor → Supervision → Sensor					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Oscillation frequency 0 to 1	0: 9501 to 9502 1: 9503 to 9504	Float	Read	Signed floating-point number	55
Frequency fluctuation 0 to 1	0: 2498 to 2499 1: 2500 to 2501	Float	Read	Signed floating-point number	55

Navigation: Application → Sensor → Supervision → Sensor					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Oscillation amplitude 0 to 1	0: 2449 to 2450 1: 2451 to 2452	Float	Read	Signed floating-point number	55
Oscillation damping 0 to 1	0: 9505 to 9506 1: 9507 to 9508	Float	Read	Positive floating-point number	55
Oscillation damping fluctuation 0 to 1	0: 2502 to 2503 1: 2504 to 2505	Float	Read	Signed floating-point number	56
Signal asymmetry 0	2443 to 2444	Float	Read	Signed floating-point number	56
Exciter current 0 to 1	0: 9509 to 9510 1: 9511 to 9512	Float	Read	Signed floating-point number	56

"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 1 = Flow override 2 = Reset all totalizers 3 = Reset totalizer 1 4 = Reset totalizer 2 5 = Reset totalizer 3 6 = Start batch 7 = Start & stop batch	57
Value status input	2746	Integer	Read	0 = Low 1 = High	57
Active level	2530	Integer	Read / Write	0 = Low 1 = High	58
Response time status input	3404 to 3405	Float	Read / Write	10 to 200 ms	58

"I/O configuration" submenu

Navigation: Application → I/O configuration					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Input/output	6417	Integer	Read / Write	0 = Off 1 = Batch status 5 = Status input 51 = Switch output 1 52 = Switch output 2	58
Apply I/O configuration	8665	Integer	Read / Write	0 = Yes 1 = No	59

"Batching" submenu

"Operation" submenu

Navigation: Application → Batching → Operation					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Batch control	2829	Integer	Read / Write	0 = Stop 6 = Start	60
Batch counter	3520	Integer	Read	Positive integer	61
Last fill quantity	2844 to 2845	Float	Read	Signed floating-point number	61
Last drip quantity	3238 to 3239	Float	Read	Signed floating-point number	61

Navigation: Application → Batching → Operation					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Last filling time	2992 to 2993	Float	Read	Positive floating-point number	61
Last close time	2994 to 2995	Float	Read	Positive floating-point number	61
Drip correction quantity	3240 to 3241	Float	Read	Signed floating-point number	62
Batch totalizer	3262 to 3263	Float	Read	Signed floating-point number	62
Totalizer overflow	3552 to 3553	Float	Read	−32 000.0 to 32 000.0	62
Batch unit	21295	Integer	Read	0 = cm^3 1 = dm^3 3 = ml 4 = l 9 = ft^3 10 = fl oz (us) 11 = gal (us) 12 = g 13 = kg 14 = oz 15 = lb	63
Switch output function 1	2488	Integer	Read / Write	0 = Batching 1 = Open 2 = Closed	63
Switch state 1	3518	Integer	Read	1 = Open 2 = Closed	63
Switch output function 2	2489	Integer	Read / Write	0 = Batching 1 = Open 2 = Closed	63
Switch state 2	3519	Integer	Read	1 = Open 2 = Closed	63
Batch profile	3000	Integer	Read / Write	0 = Profile 1 1 = Profile 2 2 = Profile 3 3 = Profile 4 4 = Profile 5 5 = Profile 6	64

"Configuration" submenu

"Batch profile 1 to n settings" submenu

Navigation: Application → Batching → Configuration → Batch profile 1 to n settings					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Assign process variable	1: 3580 2: 3581 3: 3582 4: 3583 5: 3584 6: 3585	Integer	Read / Write	0 = Off 1 = Mass flow 2 = Volume flow	65
Batch unit	1: 3530 2: 3531 3: 3532 4: 3533 5: 3534 6: 3535	Integer	Read / Write	0 = cm^3 * 1 = dm^3 * 3 = ml * 4 = l * 9 = ft^3 * 10 = fl oz (us) * 11 = gal (us) * 12 = g * 13 = kg * 14 = oz * 15 = lb *	66

Navigation: Application → Batching → Configuration → Batch profile 1 to n settings					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Fill quantity	1: 3586 to 3587 2: 3588 to 3589 3: 3590 to 3591 4: 3592 to 3593 5: 3594 to 3595 6: 3596 to 3597	Float	Read / Write	Signed floating-point number	66
Measuring time drip quantity	1: 3646 to 3647 2: 3648 to 3649 3: 3650 to 3651 4: 3652 to 3653 5: 3654 to 3655 6: 3656 to 3657	Float	Read / Write	0.01 to 100 s	66
Fixed correction quantity	1: 3634 to 3635 2: 3636 to 3637 3: 3638 to 3639 4: 3640 to 3641 5: 3642 to 3643 6: 3644 to 3645	Float	Read / Write	Signed floating-point number	67
Drip measurement mode	1: 3880 2: 3881 3: 3882 4: 3883 5: 3884 6: 3885	Integer	Read / Write	0 = Off 1 = Fixed time 2 = Fixed time or low flow cut off	67
Drip correction mode	1: 25284 2: 25285 3: 25286 4: 25287 5: 25288 6: 25289	Integer	Read / Write	0 = Standard 1 = Dynamic 2 = Time-controlled	68
Drip median filter	1: 3598 2: 3599 3: 3600 4: 3601 5: 3602 6: 3603	Integer	Read / Write	0 = Off 1 = Median 3 2 = Median 5 3 = Median 7	69
Average drip correction quantity	1: 3658 2: 3659 3: 3660 4: 3661 5: 3662 6: 3663	Integer	Read / Write	1 to 100	69
Batch averaging	1: 25292 2: 25293 3: 25294 4: 25295 5: 25296 6: 25297	Integer	Read / Write	1 to 1000	69
Flow rate averaging	1: 26903 to 26904 2: 26905 to 26906 3: 26907 to 26908 4: 26909 to 26910 5: 26911 to 26912 6: 26913 to 26914	Float	Read / Write	Positive floating-point number	70

Navigation: Application → Batching → Configuration → Batch profile 1 to n settings					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Batch stages	1: 3664 2: 3665 3: 3666 4: 3667 5: 3668 6: 3669	Integer	Read / Write	0 = One-stage 1 = Two-stage 2 = One-stage and blow out	70
Stage 2 start	1: 3820 to 3821 2: 3822 to 3823 3: 3824 to 3825 4: 3826 to 3827 5: 3828 to 3829 6: 3830 to 3831	Float	Read / Write	0 to 100 %	70
Stage 2 stop	1: 3832 to 3833 2: 3834 to 3835 3: 3836 to 3837 4: 3838 to 3839 5: 3840 to 3841 6: 3842 to 3843	Float	Read / Write	0 to 100 %	71
Blowout delay	1: 3886 to 3887 2: 3888 to 3889 3: 3890 to 3891 4: 3892 to 3893 5: 3894 to 3895 6: 3896 to 3897	Float	Read / Write	0 to 100 s	71
Blowout duration	1: 3922 to 3923 2: 3924 to 3925 3: 3926 to 3927 4: 3928 to 3929 5: 3930 to 3931 6: 3932 to 3933	Float	Read / Write	0 to 100 s	72
Maximum batch time	1: 3850 to 3851 2: 3852 to 3853 3: 3854 to 3855 4: 3856 to 3857 5: 3858 to 3859 6: 3860 to 3861	Float	Read / Write	Positive floating-point number	72
Maximum flow rate	1: 3862 to 3863 2: 3864 to 3865 3: 3866 to 3867 4: 3868 to 3869 5: 3870 to 3871 6: 3872 to 3873	Float	Read / Write	Signed floating-point number	72
Drip correction quantity	1: 26871 to 26872 2: 26873 to 26874 3: 26875 to 26876 4: 26877 to 26878 5: 26879 to 26880 6: 26881 to 26882	Float	Read	0 to 100 000 l	72

* Visibility depends on order options or device settings

"Modbus" submenu

"Modbus configuration" submenu

Navigation: Application → Modbus → Modbus configuration					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Bus address	4910	Integer	Read / Write	1 to 247	74
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 8 = 230400 BAUD	74
Parity	4914	Integer	Read / Write	0 = Even 1 = Odd 2 = None / 2 stop bits 3 = None / 1 stop bit	75
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	75
Telegram delay	4916 to 4917	Float	Read / Write	0 to 100 ms	76
Failure mode	4920	Integer	Read / Write	0 = NaN value 1 = Last valid value	76

"Modbus data map" submenu

Navigation: Application → Modbus → 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	76

"Modbus information" submenu

Navigation: Application → Modbus → Modbus information					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Device ID	2547	Integer	Read	0 to 65 535	77
Device revision	4481	Integer	Read	0 to 65 535	77

8.3.4 "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	512 = Temporarily locked	79
Configuration counter	4818	Integer	Read	0 to 65 535	80
Device reset	6817	Integer	Read / Write	0 = Cancel 1 = Restart device 2 = To delivery settings 25 = Restore S-DAT backup * 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	Max. 16-digit character string comprising numbers, letters and special characters	81

"Date/time" submenu

Navigation: System → Date/time					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Time format	2150	Integer	Read / Write	12 = 12 h AM/PM 24 = 24 h	82

"Information" submenu

"Device" submenu

Navigation: System → Information → Device					
Parameter	**Register**	**Data type**	**Access**	**Selection / User entry / User interface**	**→**
Device name	7263 to 7270	String	Read	Character string comprising numbers, letters and special characters	83
Device tag	2026 to 2041	String	Read / Write	Character string comprising numbers, letters and special characters (32)	84
Serial number	7003 to 7008	String	Read	Character string comprising numbers, letters and special characters	84
Order code	2058 to 2067	String	Read	Character string comprising numbers, letters and special characters	84

Navigation: System → Information → Device					
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	84
Extended order code 1	2212 to 2221	String	Read	Character string comprising numbers, letters and special characters	85
Extended order code 2	2222 to 2231	String	Read	Character string comprising numbers, letters and special characters	85
Extended order code 3	2232 to 2241	String	Read	Character string comprising numbers, letters and special characters	85
ENP version	4003 to 4010	String	Read	Character string comprising numbers, letters and special characters	85
Manufacturer	8001 to 8016	String	Read	Character string comprising numbers, letters and special characters	86

"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	86

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