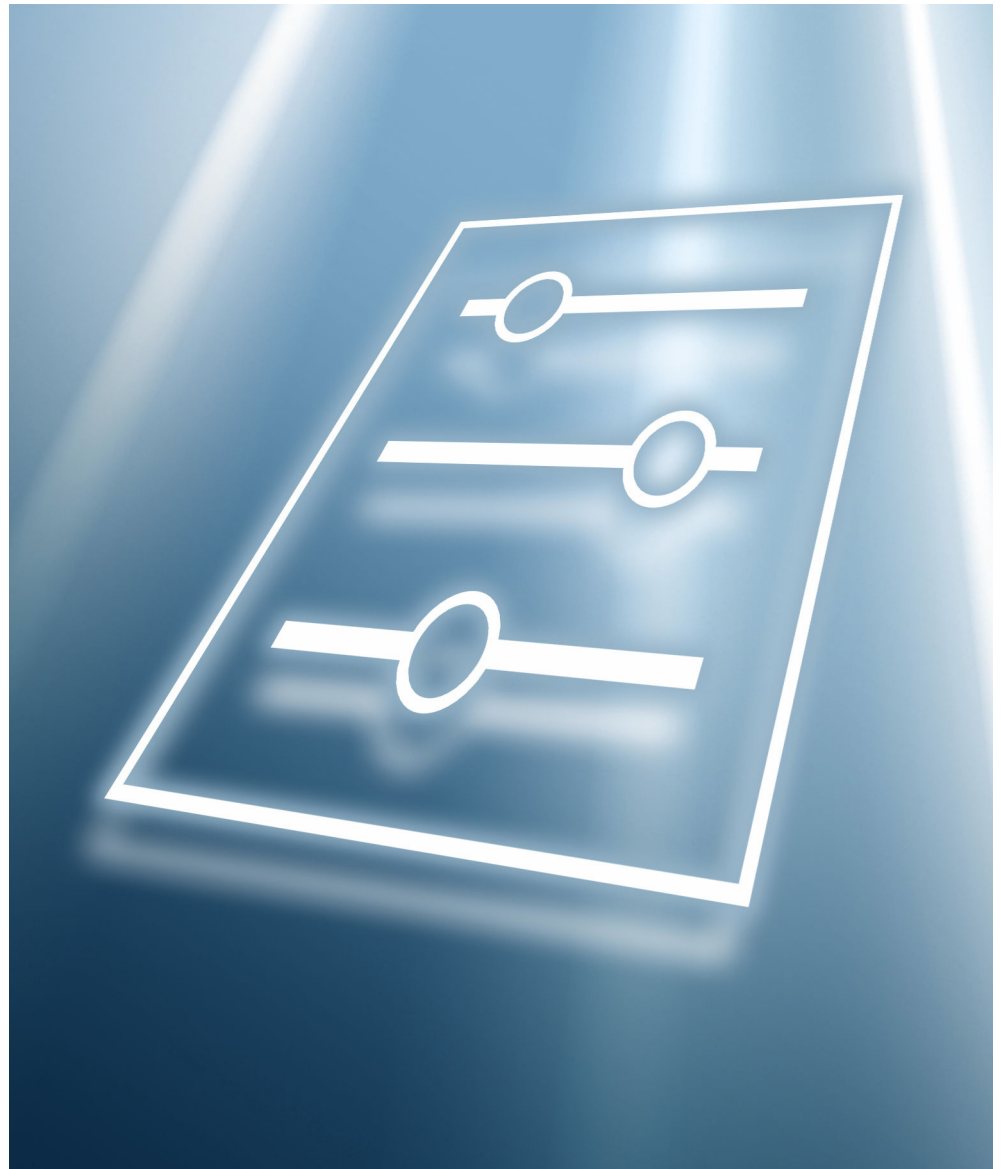


# Description of Device Parameters

## Dosimag

Electromagnetic flowmeter  
Modbus RS485





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# 1 About this document

## 1.1 Document function

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

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

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








## 1.2 Target group

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

## 1.3 Using this document





### 1.3.1 Symbols

#### Types of information

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




### 1.3.2 Information on the document structure

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

- **Guidance** menu with the **Commissioning** wizard (→  6), which guides the user automatically through all the device parameters that are required for commissioning
- **Application** menu (→  30)
- **Diagnostics** menu (→  19)
- **System** menu (→  69)

### 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 = 
<b>Navigation</b>	 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.
<b>Prerequisite</b>	The parameter is only available under these specific conditions
<b>Description</b>	Description of the parameter function
<b>Selection</b>	List of the individual options for the parameter <ul style="list-style-type: none"> <li>■ Option 1</li> <li>■ Option 2</li> </ul>
<b>User entry</b>	Input range for the parameter
<b>User interface</b>	Display value/data for the parameter
<b>Additional information</b>	Additional explanations (e.g. in examples): <ul style="list-style-type: none"> <li>■ On individual options</li> <li>■ On display values/data</li> <li>■ On the input range</li> <li>■ On the parameter function</li> </ul>

## 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.

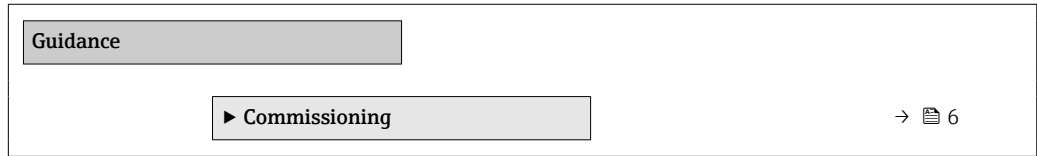
The related documentation is available online:

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

## 2 "Guidance" menu

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

Navigation  Guidance



### 2.1 "Commissioning" wizard

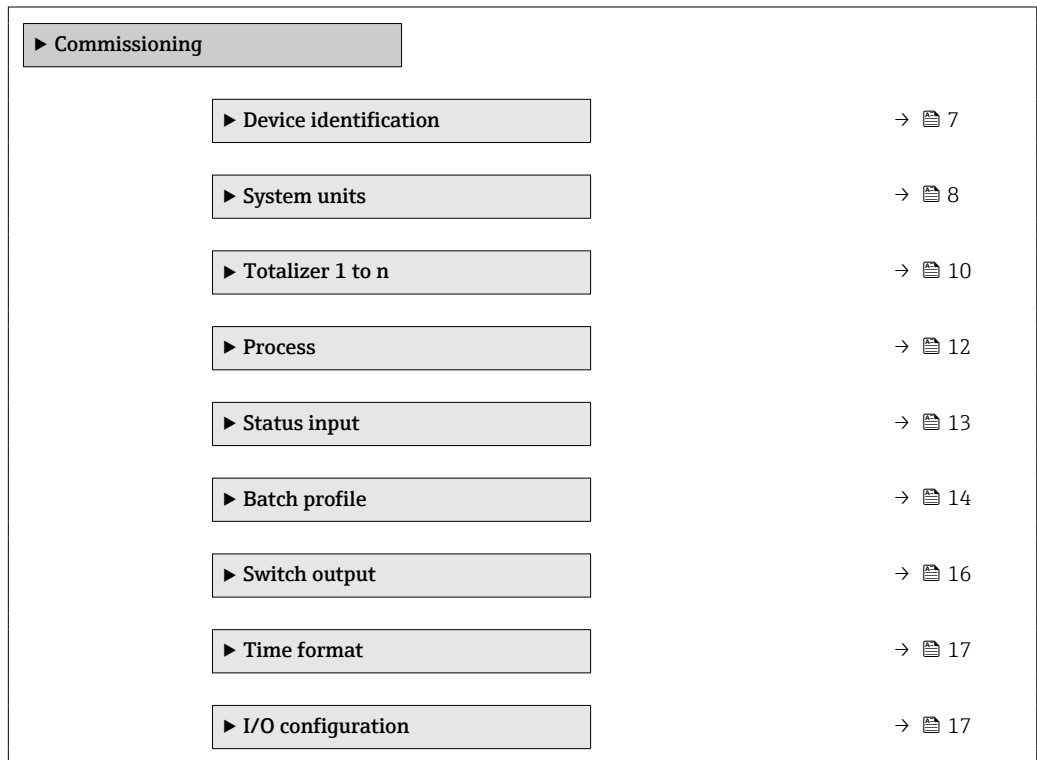
Complete this wizard to commission the device.

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.

<b>Device tag</b> 	
<b>Navigation</b>	 Guidance → Commissioning → Device ident. → Device tag
<b>Description</b>	Enter a unique designation for the measuring point to be able to easily identify it within the plant.
<b>User entry</b>	Character string comprising numbers, letters and special characters (32)
<b>Serial number</b>	
<b>Navigation</b>	 Guidance → Commissioning → Device ident. → Serial number
<b>Description</b>	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.
<b>User interface</b>	Character string comprising numbers, letters and special characters
<b>Firmware version</b>	
<b>Navigation</b>	 Guidance → Commissioning → Device ident. → Firmware version
<b>Description</b>	Displays the device firmware version installed.
<b>User interface</b>	Character string comprising numbers, letters and special characters
<b>Device name</b>	
<b>Navigation</b>	 Guidance → Commissioning → Device ident. → Device name
<b>Description</b>	Displays the name of the transmitter. The transmitter name is also provided on the nameplate of the transmitter.
<b>User interface</b>	Character string comprising numbers, letters and special characters

## 2.1.2 System units

Navigation  Guidance → Commissioning → System units



### Volume flow unit

Navigation  Guidance → Commissioning → System units → Volume flow unit

Description Select the volume flow unit.

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

Additional information *Options*

 For an explanation of the abbreviated units: →  80



**Volume unit**



**Navigation** Guidance → Commissioning → System units → Volume unit

**Description** Select the volume unit.

- Selection**
- |  |  |   |
|--|--|---|
| <p><i>SI units</i></p> <ul style="list-style-type: none"> <li>■ cm<sup>3</sup></li> <li>■ dm<sup>3</sup></li> <li>■ m<sup>3</sup></li> <li>■ ml</li> <li>■ l</li> <li>■ hl</li> <li>■ Ml Mega</li> </ul> | <p><i>US units</i></p> <ul style="list-style-type: none"> <li>■ af</li> <li>■ ft<sup>3</sup></li> <li>■ fl oz (us)</li> <li>■ gal (us)</li> <li>■ kgal (us)</li> <li>■ Mgal (us)</li> <li>■ bbl (us;oil)</li> <li>■ bbl (us;liq.)</li> <li>■ bbl (us;beer)</li> <li>■ bbl (us;tank)</li> </ul> | <p><i>Imperial units</i></p> <ul style="list-style-type: none"> <li>■ gal (imp)</li> <li>■ Mgal (imp)</li> <li>■ bbl (imp;beer)</li> <li>■ bbl (imp;oil)</li> </ul> |
|--|--|---|

**Additional information** *Selection*  
 For an explanation of the abbreviated units: → 80

**Temperature unit**



**Navigation** Guidance → Commissioning → System units → Temperature unit


**Prerequisite** Only available for nominal diameters DN 15 to DN 25 (½ to 1") with order code for "Sensor option", option CI "Medium temperature measurement".

**Description** Select the temperature unit.


- Selection**
- |  |   |
|--|---|
| <p><i>SI units</i></p> <ul style="list-style-type: none"> <li>■ °C</li> <li>■ K</li> </ul> | <p><i>US units</i></p> <ul style="list-style-type: none"> <li>■ °F</li> <li>■ °R</li> </ul> |
|--|---|

**Additional information** *Selection*  
 For an explanation of the abbreviated units: → 80

### 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

#### 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**
- |   |  |   |
|---|--|---|
| <p><i>SI units</i></p> <ul style="list-style-type: none"> <li>■ cm<sup>3</sup>*</li> <li>■ dm<sup>3</sup>*</li> <li>■ m<sup>3</sup>*</li> <li>■ ml*</li> <li>■ l*</li> <li>■ hl*</li> <li>■ Ml Mega*</li> </ul> | <p><i>US units</i></p> <ul style="list-style-type: none"> <li>■ af*</li> <li>■ ft<sup>3</sup>*</li> <li>■ Mft<sup>3</sup>*</li> <li>■ Mft<sup>3</sup>*</li> <li>■ fl oz (us)*</li> <li>■ gal (us)*</li> <li>■ kgal (us)*</li> <li>■ Mgal (us)*</li> <li>■ bbl (us;liq.)*</li> <li>■ bbl (us;beer)*</li> <li>■ bbl (us;oil)*</li> <li>■ bbl (us;tank)*</li> </ul> | <p><i>Imperial units</i></p> <ul style="list-style-type: none"> <li>■ gal (imp)*</li> <li>■ Mgal (imp)*</li> <li>■ bbl (imp;beer)*</li> <li>■ bbl (imp;oil)*</li> </ul> |
|---|--|---|

\* Visibility depends on order options or device settings

or

*Other units*  
None\*

\* Visibility depends on order options or device settings

---

**Totalizer operation mode**


<b>Navigation</b>	Guidance → Commissioning → Totalizer 1 to n → Operat. mode 1 to n
<b>Description</b>	Select the totalizer operation mode, e.g. only totalize forward flow or only totalize reverse flow.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Net</li> <li>■ Forward</li> <li>■ Reverse</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Net</b> option The flow values in the forward and reverse flow directions are totalized and netted against each other. Net flow is recorded in the flow direction.</li> <li>■ <b>Forward</b> option Only the flow in the forward flow direction is totalized.</li> <li>■ <b>Reverse</b> option Only the flow in the reverse flow direction is totalized (= reverse flow quantity).</li> </ul>

---


**Totalizer failure behavior**


<b>Navigation</b>	Guidance → Commissioning → Totalizer 1 to n → FailureBehav. 1 to n
<b>Description</b>	Specify how the totalizer should behave in the event of a device alarm.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Hold</li> <li>■ Continue</li> <li>■ Last valid value + continue</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Hold</b> option The totalizer is stopped in the event of a device alarm.</li> <li>■ <b>Continue</b> option The totalizer continues to totalize based on the current value measured; the device alarm is ignored.</li> <li>■ <b>Last valid value + continue</b> option The totalizer continues to totalize based on the last valid value measured before the device alarm occurred.</li> </ul>

## 2.1.4 Process

Navigation  Guidance → Commissioning → Process

### Low flow cutoff

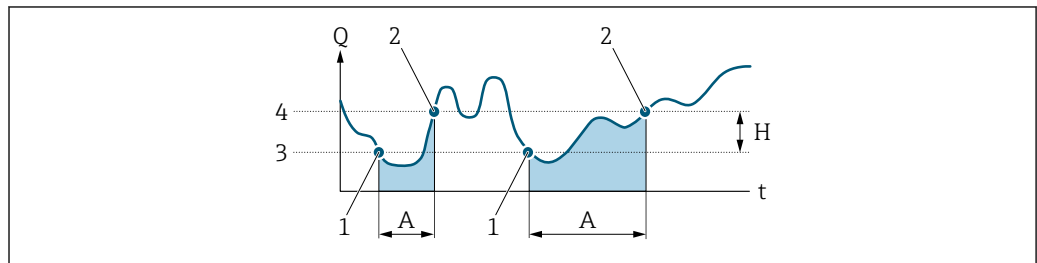
Navigation  Guidance → Commissioning → Process → Low flow cutoff

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

Selection

- Off
- 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  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**



<b>Navigation</b>	Guidance → Commissioning → Process → Off value
<b>Description</b>	Enter off value to switch off low flow cutoff. The off value is entered as a positive hysteresis with respect to the on value.
<b>User entry</b>	0 to 100.0 %

**2.1.5 Status input**



*Navigation*      Guidance → Commissioning → Status input

**Assign status input**





<b>Navigation</b>	Guidance → Commissioning → Status input → Assign stat.inp.
<b>Description</b>	Assign a function to the status input. When the signal level switches from inactive to active ("Active level" parameter), the function assigned is triggered.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Start batch</li> <li>■ Start &amp; stop batch</li> <li>■ Reset totalizer 1</li> <li>■ Reset totalizer 2</li> <li>■ Reset totalizer 3</li> <li>■ Reset all totalizers</li> <li>■ Flow override</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Start batch</b> option Starts a batch, provided a batch is not already in progress. Once started, the batch procedure continues until complete.</li> <li>■ <b>Start &amp; stop batch</b> 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.</li> <li>■ <b>Reset totalizer 1</b> option Resets the totalizer 1.</li> <li>■ <b>Reset totalizer 2</b> option Resets the totalizer 2.</li> <li>■ <b>Reset totalizer 3</b> option Resets the totalizer 3.</li> <li>■ <b>Reset all totalizers</b> option Resets all totalizers.</li> <li>■ <b>Flow override</b> option Activates flow override. Flow override is active until the signal level switches back from active to inactive.</li> </ul>

---

<b>Active level</b>		
<b>Navigation</b>		Guidance → Commissioning → Status input → Active level
<b>Description</b>	Select the signal level that triggers the function assigned to the status input.	
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ High</li> <li>■ Low</li> </ul>	
<b>Additional information</b>	<i>Selection</i> <ul style="list-style-type: none"> <li>■ <b>High</b> option The function is triggered when a voltage is present.</li> <li>■ <b>Low</b> option The function is triggered when no voltage is present.</li> </ul>	


---

<b>Response time status input</b>		
<b>Navigation</b>		Guidance → Commissioning → Status input → Response time
<b>Description</b>	Specify the minimum amount of time the input signal level must be present before the selected function is triggered.	
<b>User entry</b>	10 to 200 ms	

### 2.1.6 Batch profile 1 to n

*Navigation*        Guidance → Commissioning → Batch profile

---

<b>Assign process variable</b>		
<b>Navigation</b>		Guidance → Commissioning → Batch profile → AssignVariab.
<b>Description</b>	Select a process variable.	
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Volume flow</li> </ul>	

**Batch unit**



<b>Navigation</b>	Guidance → Commissioning → Batch profile → Batch unit				
<b>Prerequisite</b>	A process variable is selected in the <b>Assign process variable</b> parameter (→  14).				
<b>Description</b>	Select the unit.				
<b>Selection</b>	<table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top;"><i>SI units</i></td> <td style="vertical-align: top;"><i>US units</i></td> </tr> <tr> <td> <ul style="list-style-type: none"> <li>■ l<sup>*</sup></li> <li>■ dm<sup>3</sup><sup>*</sup></li> <li>■ cm<sup>3</sup><sup>*</sup></li> <li>■ ml<sup>*</sup></li> </ul> </td> <td> <ul style="list-style-type: none"> <li>■ ft<sup>3</sup><sup>*</sup></li> <li>■ fl oz (us)<sup>*</sup></li> <li>■ gal (us)<sup>*</sup></li> </ul> </td> </tr> </table>	<i>SI units</i>	<i>US units</i>	<ul style="list-style-type: none"> <li>■ l<sup>*</sup></li> <li>■ dm<sup>3</sup><sup>*</sup></li> <li>■ cm<sup>3</sup><sup>*</sup></li> <li>■ ml<sup>*</sup></li> </ul>	<ul style="list-style-type: none"> <li>■ ft<sup>3</sup><sup>*</sup></li> <li>■ fl oz (us)<sup>*</sup></li> <li>■ gal (us)<sup>*</sup></li> </ul>
<i>SI units</i>	<i>US units</i>				
<ul style="list-style-type: none"> <li>■ l<sup>*</sup></li> <li>■ dm<sup>3</sup><sup>*</sup></li> <li>■ cm<sup>3</sup><sup>*</sup></li> <li>■ ml<sup>*</sup></li> </ul>	<ul style="list-style-type: none"> <li>■ ft<sup>3</sup><sup>*</sup></li> <li>■ fl oz (us)<sup>*</sup></li> <li>■ gal (us)<sup>*</sup></li> </ul>				
<p>* Visibility depends on order options or device settings</p>					

**Fill quantity**



<b>Navigation</b>	Guidance → Commissioning → Batch profile → Fill quantity
<b>Prerequisite</b>	A process variable is selected in the <b>Assign process variable</b> parameter (→  14).
<b>Description</b>	Enter the fill quantity.
<b>User entry</b>	Signed floating-point number


**Drip measurement mode**





<b>Navigation</b>	Guidance → Commissioning → Batch profile → Drip measurement
<b>Prerequisite</b>	<p>A process variable is selected in the <b>Assign process variable</b> parameter (→  14).</p> <p>The <b>Off</b> option is not selected in the <b>Drip measurement mode</b> parameter (→  15).</p>
<b>Description</b>	<p>Select the drip measurement mode.</p> <p>Drip is measured at the end of each batch and applied to calculate the drip correction 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.</p>
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Fixed time</li> <li>■ Fixed time or low flow cut off</li> </ul>

<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>▪ <b>Off</b> 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.</li> <li>▪ <b>Fixed time</b> 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).</li> <li>▪ <b>Fixed time or low flow cut off</b> 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).</li> </ul>
-------------------------------	---


## 2.1.7 Switch output

*Navigation*  Guidance → Commissioning → Switch output





<b>Switch output function</b> 	
<b>Navigation</b>	 Guidance → Commissioning → Switch output → SwitchOutFunc 1
<b>Description</b>	Assign a function to the switch output.
<b>Selection</b>	<ul style="list-style-type: none"> <li>▪ Closed</li> <li>▪ Open</li> <li>▪ Batching</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>▪ <b>Closed</b> option The switch output is permanently switched on (closed, conductive).</li> <li>▪ <b>Open</b> option The switch output is permanently switched off (open, non-conductive).</li> <li>▪ <b>Batching</b> 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.</li> </ul>



### 2.1.8 Time format

Navigation   Guidance → Commissioning → Time format



---

<b>Time format</b>	
<hr/>	
<b>Navigation</b>	 Guidance → Commissioning → Time format → Time format
<b>Description</b>	Select the time format.
<b>Selection</b>	<ul style="list-style-type: none"> <li>▪ 24 h</li> <li>▪ 12 h AM/PM</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <p> For an explanation of the abbreviated units: →  80</p>

### 2.1.9 I/O configuration

Navigation   Guidance → Commissioning → I/O config.

---

<b>Input/output</b>	
<hr/>	
<b>Navigation</b>	 Guidance → Commissioning → I/O config. → Input/output
<b>Description</b>	Set the universal input/output to the input/output type required.
<b>Selection</b>	<ul style="list-style-type: none"> <li>▪ Off</li> <li>▪ Status input</li> <li>▪ Batch status</li> <li>▪ Switch output 1</li> <li>▪ Switch output 2</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>▪ <b>Off</b> option The universal input/output is not used.</li> <li>▪ <b>Status input</b> option Performs the function assigned to the status input.</li> <li>▪ <b>Batch status</b> option Indicates whether a batch is in progress.</li> <li>▪ <b>Switch output 1</b> option Indicates the state of switch output 1.</li> <li>▪ <b>Switch output 2</b> option Indicates the state of switch output 2.</li> </ul>


---

## 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

<b>Diagnostics</b>		
▶ Active diagnostics		→  20
▶ Simulation		→  22
▶ Diagnostic settings		→  24

### 3.1 Active diagnostics

Navigation  Diagnostics → Active diagnos.


▶ Active diagnostics

Actual diagnostics	→  20
Timestamp	→  20
Previous diagnostics	→  20
Timestamp	→  21
Operating time from restart	→  21
Operating time	→  21

---

#### 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

▶ Simulation

Assign simulation process variable	→  22
Process value	→  22
Device alarm simulation	→  23
Diagnostic event simulation	→  23
Status input simulation	→  23
Input signal level	→  23

---

### Assign simulation process variable

**Navigation**  Diagnostics → Simulation → Assign proc.var.

**Description** Select a process variable to activate the simulation.

**Selection**

- Off
- Volume flow
- 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


---

\* Visibility depends on order options or device settings

---

**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

▶ Diagnostic settings


▶ Properties →  24

▶ Diagnostic configuration →  24

#### 3.3.1 Properties


Navigation   Diagnostics → Diag. settings → Properties

▶ Properties

Alarm delay →  24

#### 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.


▶ Diagnostic configuration

▶ Configuration →  56









▶ Process →  25



**Process**

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


▶ **Process**

Assign behavior of diagnostic no. 834	→  25
Assign behavior of diagnostic no. 835	→  26
Assign behavior of diagnostic no. 842	→  26
Assign behavior of diagnostic no. 937	→  27
Assign behavior of diagnostic no. 938	→  27
Assign behavior of diagnostic no. 961	→  28
Assign behavior of diagnostic no. 991	→  28
Assign behavior of diagnostic no. 992	→  29

**Assign behavior of diagnostic no. 834**



**Navigation**

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

**Prerequisite**

Only available for nominal diameters DN 15 to DN 25 (½ to 1") with order code "Sensor option", option CI "Fluid temperature measurement".

**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 	
<b>Navigation</b>	 Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 835
<b>Prerequisite</b>	Only available for nominal diameters DN 15 to DN 25 (½ to 1") with order code "Sensor option", option CI "Fluid temperature measurement".
<b>Description</b>	Select behavior for diagnostic event "835 Process temperature too low".
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Alarm</li> <li>■ Warning</li> <li>■ Logbook entry only</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Off</b> option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>■ <b>Alarm</b> option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>■ <b>Warning</b> option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>■ <b>Logbook entry only</b> option The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.</li> </ul>

Assign behavior of diagnostic no. 842 	
<b>Navigation</b>	 Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 842
<b>Description</b>	Select behavior for diagnostic event "842 Process value below limit".
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Alarm</li> <li>■ Warning</li> <li>■ Logbook entry only</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Off</b> option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>■ <b>Alarm</b> option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>■ <b>Warning</b> option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>■ <b>Logbook entry only</b> option The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.</li> </ul>

**Assign behavior of diagnostic no. 937**



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

**Assign behavior of diagnostic no. 938**



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

---

**Assign behavior of diagnostic no. 961**


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

---

**Assign behavior of diagnostic no. 991**


<b>Navigation</b>	Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 991
<b>Description</b>	Select behavior for diagnostic event "991 Batch process aborted".
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Alarm</li> <li>■ Warning</li> <li>■ Logbook entry only</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Off</b> option The diagnostic event is ignored and no diagnostic message is generated or logged.</li> <li>■ <b>Alarm</b> option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li> <li>■ <b>Warning</b> option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li> <li>■ <b>Logbook entry only</b> option The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.</li> </ul>

---

**Assign behavior of diagnostic no. 992**

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







<b>Navigation</b>	Diagnostics → Diag. settings → Diag. config. → Process → Diagnostic no. 992
<b>Description</b>	Select behavior for diagnostic event "992 Batch start failed".
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook entry only</li></ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"><li>▪ <b>Off</b> option The diagnostic event is ignored and no diagnostic message is generated or logged.</li><li>▪ <b>Alarm</b> option The device stops measuring. The signal outputs and totalizers assume the specified alarm condition. A diagnostic message is generated.</li><li>▪ <b>Warning</b> option The device continues measuring. The signal outputs and totalizers are not affected. A diagnostic message is generated.</li><li>▪ <b>Logbook entry only</b> option The device continues measuring. The diagnostic message is only displayed in the "Event logbook" submenu and does not alternate with the standard operational information displayed.</li></ul>

## 4 "Application" menu




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

Navigation  Application

Application	
▶ Measured values	→  30
▶ System units	→  33
▶ Totalizers	→  36
▶ Sensor	→  40
▶ Status input	→  48
▶ I/O configuration	→  50
▶ Batching	→  51
▶ Modbus	→  65

### 4.1 Measured values

Navigation  Application → Measured values

▶ Measured values	
Volume flow	→  30
Temperature	→  31
▶ Totalizer	→  31

---

#### Volume flow

---

**Navigation**  Application → Measured values → Volume flow

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

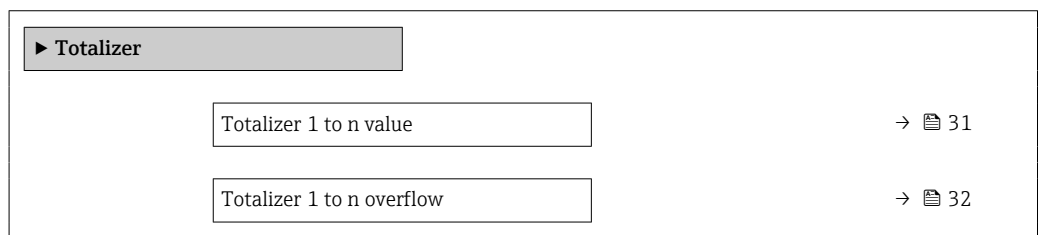
**User interface** Signed floating-point number

**Temperature**

<b>Navigation</b>	☰ Application → Measured values → Temperature
<b>Prerequisite</b>	Only available for nominal diameters DN 15 to DN 25 (½ to 1") with order code for "Sensor option", option CI "Medium temperature measurement".
<b>Description</b>	Displays the medium temperature measured. The unit is set in the "System units" menu.
<b>User interface</b>	Positive floating-point number

**4.1.1 Totalizer**

*Navigation* ☰☰ Application → Measured values → Totalizer



**Totalizer value**


<b>Navigation</b>	☰ Application → Measured values → Totalizer → Tot. 1 to n value
<b>Prerequisite</b>	A process variable has been selected in the <b>Assign process variable</b> parameter in the <b>Totalizer 1 to n</b> submenu.
<b>Description</b>	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 <sup>3</sup> Value of "Totalizer overflow" parameter: 1 × 10 <sup>7</sup> (1 overflow) = 10,000,000 m <sup>3</sup> Counter (total): 11,968,457 m <sup>3</sup> In the event of a fault condition, the totalizer behaves as specified in the "Totalizer failure behavior" parameter.
<b>User interface</b>	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).

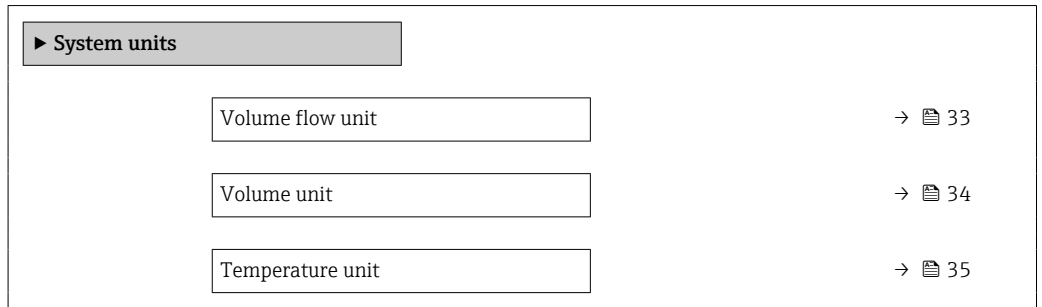
**User interface**

-32 000.0 to 32 000.0



## 4.2 System units

Navigation   Application → System units



---

### Volume flow unit



Navigation  Application → System units → Volume flow unit

Description Select the volume flow unit.

**Selection***SI units*

- cm<sup>3</sup>/s
- cm<sup>3</sup>/min
- cm<sup>3</sup>/h
- cm<sup>3</sup>/d
- dm<sup>3</sup>/s
- dm<sup>3</sup>/min
- dm<sup>3</sup>/h
- dm<sup>3</sup>/d
- m<sup>3</sup>/s
- m<sup>3</sup>/min
- m<sup>3</sup>/h
- m<sup>3</sup>/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<sup>3</sup>/s
- ft<sup>3</sup>/min
- ft<sup>3</sup>/h
- ft<sup>3</sup>/d
- fl oz/s (us)
- fl oz/min (us)
- fl oz/h (us)
- fl oz/d (us)
- gal/s (us)
- gal/min (us)
- gal/h (us)
- gal/d (us)
- Mgal/s (us)
- Mgal/min (us)
- Mgal/h (us)
- Mgal/d (us)
- bbl/s (us;liq.)
- bbl/min (us;liq.)
- bbl/h (us;liq.)
- bbl/d (us;liq.)
- bbl/s (us;beer)
- bbl/min (us;beer)
- bbl/h (us;beer)
- bbl/d (us;beer)
- bbl/s (us;oil)
- bbl/min (us;oil)
- bbl/h (us;oil)
- bbl/d (us;oil)
- bbl/s (us;tank)
- bbl/min (us;tank)
- bbl/h (us;tank)
- bbl/d (us;tank)
- 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: →  80



**Volume unit****Navigation**

 Application → System units → Volume unit

**Description**

Select the volume unit.

<b>Selection</b>	<i>SI units</i> <ul style="list-style-type: none"> <li>■ cm<sup>3</sup></li> <li>■ dm<sup>3</sup></li> <li>■ m<sup>3</sup></li> <li>■ ml</li> <li>■ l</li> <li>■ hl</li> <li>■ Ml Mega</li> </ul>	<i>US units</i> <ul style="list-style-type: none"> <li>■ af</li> <li>■ ft<sup>3</sup></li> <li>■ fl oz (us)</li> <li>■ gal (us)</li> <li>■ kgal (us)</li> <li>■ Mgal (us)</li> <li>■ bbl (us;oil)</li> <li>■ bbl (us;liq.)</li> <li>■ bbl (us;beer)</li> <li>■ bbl (us;tank)</li> </ul>	<i>Imperial units</i> <ul style="list-style-type: none"> <li>■ gal (imp)</li> <li>■ Mgal (imp)</li> <li>■ bbl (imp;beer)</li> <li>■ bbl (imp;oil)</li> </ul>
------------------	---	---	--

**Additional information**      *Selection*  
 For an explanation of the abbreviated units: →  80

**Temperature unit**





**Navigation**            Application → System units → Temperature unit

**Prerequisite**      Only available for nominal diameters DN 15 to DN 25 (½ to 1") with order code for "Sensor option", option CI "Medium temperature measurement".



**Description**      Select the temperature unit.

<b>Selection</b>	<i>SI units</i> <ul style="list-style-type: none"> <li>■ °C</li> <li>■ K</li> </ul>	<i>US units</i> <ul style="list-style-type: none"> <li>■ °F</li> <li>■ °R</li> </ul>
------------------	---	--

**Additional information**      *Selection*  
 For an explanation of the abbreviated units: →  80


## 4.3 Totalizers

Navigation  Application → Totalizers

▶ Totalizers		
▶ Totalizer handling		→  36
▶ Totalizer 1 to n		→  36

### 4.3.1 Totalizer handling

Navigation  Application → Totalizers → Totalizer


▶ Totalizer handling		
Reset all totalizers		→  36

---

#### 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

▶ Totalizer 1 to n		
Assign process variable 1 to n		→  37
Process variable unit 1 to n		→  37
Totalizer 1 to n operation mode		→  38
Totalizer 1 to n control		→  38

Preset value 1 to n	→  39
Totalizer 1 to n failure behavior	→  39

**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

**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*

- cm<sup>3</sup> \*
- dm<sup>3</sup> \*
- m<sup>3</sup> \*
- ml \*
- l \*
- hl \*
- Ml Mega \*

*US units*

- af \*
- ft<sup>3</sup> \*
- Mft<sup>3</sup> \*
- Mft<sup>3</sup> \*
- 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 	
<b>Navigation</b>	 Application → Totalizers → Totalizer 1 to n → Operat. mode 1 to n
<b>Description</b>	Select the totalizer operation mode, e.g. only totalize forward flow or only totalize reverse flow.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Net</li> <li>■ Forward</li> <li>■ Reverse</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Net</b> option The flow values in the forward and reverse flow directions are totalized and netted against each other. Net flow is recorded in the flow direction.</li> <li>■ <b>Forward</b> option Only the flow in the forward flow direction is totalized.</li> <li>■ <b>Reverse</b> option Only the flow in the reverse flow direction is totalized (= reverse flow quantity).</li> </ul>


Totalizer control	
<b>Navigation</b>	 Application → Totalizers → Totalizer 1 to n → Tot. 1 to n control
<b>Prerequisite</b>	A process variable has been selected in the <b>Assign process variable</b> parameter in the <b>Totalizer 1 to n</b> submenu.
<b>Description</b>	Operate the totalizer.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Totalize</li> <li>■ Reset + hold</li> <li>■ Preset + hold</li> <li>■ Reset + totalize</li> <li>■ Preset + totalize</li> <li>■ Hold</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Totalize</b> option The totalizer is started or continues running.</li> <li>■ <b>Reset + hold</b> option The totalizer is reset to "0" and stopped.</li> <li>■ <b>Preset + hold</b> option The totalizer is stopped and set to the start value specified in the "Preset value " parameter.</li> <li>■ <b>Reset + totalize</b> option The totalizer is reset to "0" and restarted.</li> <li>■ <b>Preset + totalize</b> option The totalizer is stopped and set to the start value specified in the "Preset value " parameter.</li> <li>■ <b>Hold</b> option The totalizer is stopped.</li> </ul>

**Preset value**

<b>Navigation</b>	 Application → Totalizers → Totalizer 1 to n → Preset value 1 to n
<b>Prerequisite</b>	A process variable has been selected in the <b>Assign process variable</b> parameter in the <b>Totalizer 1 to n</b> submenu.
<b>Description</b>	Specify a start value for the totalizer.
<b>User entry</b>	Signed floating-point number
<b>Additional information</b>	<p><i>Description</i></p> <p>The unit of the selected process variable is specified for the totalizer in the <b>Unit totalizer</b> parameter (→  10).</p> <p><i>Example</i></p> <p>This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.</p>





**Totalizer failure behavior**



<b>Navigation</b>	 Application → Totalizers → Totalizer 1 to n → FailureBehav. 1 to n
<b>Description</b>	Specify how the totalizer should behave in the event of a device alarm.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Hold</li> <li>■ Continue</li> <li>■ Last valid value + continue</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Hold</b> option The totalizer is stopped in the event of a device alarm.</li> <li>■ <b>Continue</b> option The totalizer continues to totalize based on the current value measured; the device alarm is ignored.</li> <li>■ <b>Last valid value + continue</b> option The totalizer continues to totalize based on the last valid value measured before the device alarm occurred.</li> </ul>







## 4.4 Sensor

Navigation  Application → Sensor

▶ Sensor	
▶ Process parameters	→  40
▶ Low flow cutoff	→  42
▶ Sensor adjustment	→  44
▶ Calibration	→  47


### 4.4.1 Process parameters

Navigation  Application → Sensor → Process param.

▶ Process parameters	
Binomial filter depth	→  40
Median filter depth	→  41
Flow damping	→  41
Flow override	→  41
Coil current mode	→  42
Temperature damping time	→  42

#### Binomial filter depth

**Navigation**

 Application → Sensor → Process param. → Binomial filter

**Description**

Set the binomial filter depth (0 - 32). As the filter depth increases, so does the reaction time of the device, i.e. flow damping increases (0 = off).

**User entry**

0 to 32



**Median filter depth**



<b>Navigation</b>	Application → Sensor → Process param. → Median filter
<b>Description</b>	Set the filter depth to reduce the sensitivity of the measuring signal to interference peaks. Value = 0: No damping Value > 0: Damping increases
<b>User entry</b>	0 to 32

**Flow damping**



<b>Navigation</b>	Application → Sensor → Process param. → Flow damping
<b>Description</b>	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).
<b>User entry</b>	0.0 to 100.0 s

**Flow override**



<b>Navigation</b>	Application → Sensor → Process param. → Flow override
<b>Description</b>	Reports the flow rate as zero until flow override is deactivated. Can be used for example when cleaning the pipeline.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ On</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <p><b>"On" option</b> 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</p> <p><i>Effect</i></p> <p> This setting affects all the functions of the measuring device.</p> <p> Positive zero return is not relevant for most applications.</p>

**Coil current mode**



**Navigation** Application → Sensor → Process param. → CoilCurrentMode

**Description** Select the coil current mode.

- Selection**
- Automatic
  - Standard
  - Low

**Additional information** *Selection*

- **Automatic** option  
Reduced power consumption for cleaning processes at high temperatures
- **Standard** option  
Nominal power consumption
- **Low** option  
Reduced power consumption

**Temperature damping time**



**Navigation** Application → Sensor → Process param. → TempDampingTime

**Prerequisite** Only available for nominal diameters DN 15 to DN 25 (½ to 1") with order code for "Sensor option", option CI "Medium temperature measurement".

**Description** Enter time constant for damping the temperature value.

**User entry** 0 to 999.9 s

### 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**

Low flow cutoff	→  43
On value low flow cutoff	→  43
Off value low flow cutoff	→  43

**Low flow cutoff**



**Navigation**

☰ Application → Sensor → Low flow cutoff → Low flow cutoff

**Description**

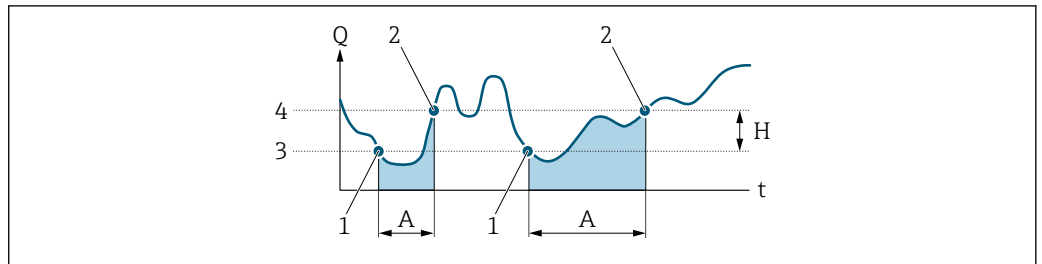
Select a process variable for low flow cutoff to activate low flow cutoff.

**Selection**

- Off
- 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 Sensor adjustment

Navigation  Application → Sensor → Sensor adjustm.

▶ Sensor adjustment	
Installation direction	→  44
Integration time	→  44
Measuring period	→  44
▶ Zero adjustment	→  45
▶ Process variable adjustment	→  46

---

#### Installation direction


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

**Description** Select the sign of the flow direction.

- Selection**
- Forward flow
  - Reverse flow

---

#### Integration time


**Navigation**  Application → Sensor → Sensor adjustm. → Integration time

**Description** Set the duration of an integration cycle.

**User entry** 1 to 65 ms

---

#### Measuring period

**Navigation**  Application → Sensor → Sensor adjustm. → Measuring period




**Description** Set the duration of a full measuring period.  
The measuring period is the time span over which a magnetic field is produced to create a measuring point.

**User entry** 0 to 1 000 ms

**Zero adjustment**

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


▶ Zero adjustment

Zero point adjustment control	→  45
Status	→  45
Progress	→  45

---

**Zero point adjustment control**

---

**Navigation**       Application → Sensor → Sensor adjustm. → Zero adjustment → Zero point adj.

**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

---

**Status**

---

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

**Description**      Displays the status of the zero point adjustment.


**User interface**

- Busy
- Failed
- Done

---

**Progress**

---

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





**Description**      Shows the progress of the process.

**User interface**      0 to 100 %


**Process variable adjustment**

Navigation  Application → Sensor → Sensor adjustm. → Variable adjust

▶ **Process variable adjustment**

Volume flow offset	→  46
Volume flow factor	→  46
Temperature offset	→  46
Temperature factor	→  47

---

**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 m<sup>3</sup>/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

---

**Temperature offset** 

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

**Prerequisite** Only available for nominal diameters DN 15 to DN 25 (½ to 1") with order code "Sensor option", option CI "Fluid temperature measurement".

<b>Description</b>	Enter the offset by which to shift the zero point for temperature in K.
<b>User entry</b>	Signed floating-point number
<b>Additional information</b>	<i>Description</i> Corrected value = (factor × value) + offset

**Temperature factor**



<b>Navigation</b>	Application → Sensor → Sensor adjustm. → Variable adjust → Temp. factor
<b>Prerequisite</b>	Only available for nominal diameters DN 15 to DN 25 (½ to 1") with order code "Sensor option", option CI "Fluid temperature measurement".
<b>Description</b>	Enter the multiplication factor to apply to the temperature value.
<b>User entry</b>	Positive floating-point number
<b>Additional information</b>	<i>Description</i> Corrected value = (factor × value) + offset

**4.4.4 Calibration**

*Navigation* Application → Sensor → Calibration

▶ Calibration

Nominal diameter	→  47
Calibration factor	→  48
Zero point	→  48

**Nominal diameter**

<b>Navigation</b>	Application → Sensor → Calibration → Nominal diameter
<b>Description</b>	Displays the nominal diameter of the sensor.
<b>User interface</b>	Character string comprising numbers, letters and special characters

**Calibration factor**

<b>Navigation</b>	☰ Application → Sensor → Calibration → Cal. factor
<b>Description</b>	Displays the current calibration factor for the sensor. The factory setting for the calibration factor can be found on the sensor's nameplate.
<b>User interface</b>	Positive floating-point number

**Zero point**



<b>Navigation</b>	☰ Application → Sensor → Calibration → Zero point
<b>Description</b>	Displays the zero point correction value for the sensor. Users logged on in the Service role have write access.
<b>User interface</b>	Signed floating-point number

## 4.5 Status input

*Navigation*      ☰☰ Application → Status input

▶ **Status input**

Assign status input	→ ☰ 48
Value status input	→ ☰ 49
Active level	→ ☰ 49
Response time status input	→ ☰ 50

**Assign status input**



<b>Navigation</b>	☰ Application → Status input → Assign stat.inp.
<b>Description</b>	Assign a function to the status input. When the signal level switches from inactive to active ("Active level" parameter), the function assigned is triggered.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Start batch</li> <li>■ Start &amp; stop batch</li> </ul>



- 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.

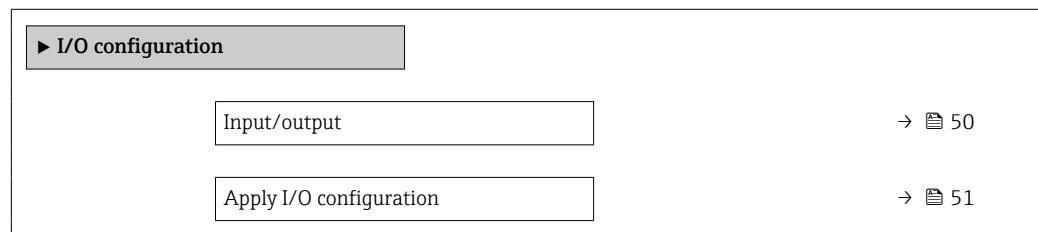
---

**Response time status input**


<b>Navigation</b>	Application → Status input → Response time
<b>Description</b>	Specify the minimum amount of time the input signal level must be present before the selected function is triggered.
<b>User entry</b>	10 to 200 ms

## 4.6 I/O configuration

*Navigation* Application → I/O config.




---

**Input/output**


<b>Navigation</b>	Application → I/O config. → Input/output
<b>Description</b>	Set the universal input/output to the input/output type required.
<b>Selection</b>	<ul style="list-style-type: none"> <li>▪ Off</li> <li>▪ Status input</li> <li>▪ Batch status</li> <li>▪ Switch output 1</li> <li>▪ Switch output 2</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>▪ <b>Off</b> option The universal input/output is not used.</li> <li>▪ <b>Status input</b> option Performs the function assigned to the status input.</li> <li>▪ <b>Batch status</b> option Indicates whether a batch is in progress.</li> <li>▪ <b>Switch output 1</b> option Indicates the state of switch output 1.</li> <li>▪ <b>Switch output 2</b> option Indicates the state of switch output 2.</li> </ul>

**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






▶ Batching		
▶ Operation		→  51
▶ Configuration		→  56

### 4.7.1 Operation

*Navigation*


Application → Batching → Operation

▶ Operation		
Batch control		→  52
Batch counter		→  52
Last fill quantity		→  52
Last drip quantity		→  53
Last filling time		→  53
Last close time		→  53
Drip correction quantity		→  53
Batch totalizer		→  54
Totalizer overflow		→  54
Batch unit		→  54

Switch output function 1	→  54
Switch state 1	→  55
Switch output function 2	→  54
Switch state 2	→  55
Batch profile	→  55


---

### Batch control

<b>Navigation</b>	 Application → Batching → Operation → Batch control
<b>Description</b>	Start or stop the batch process. Use to control the batch process via a fieldbus or manually via a device interface.
<b>Selection</b>	<ul style="list-style-type: none"> <li>▪ Start</li> <li>▪ Stop</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>▪ <b>Start</b> option Starts a batch, provided a batch is not already in progress.</li> <li>▪ <b>Stop</b> 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.</li> </ul>


---

### Batch counter

<b>Navigation</b>	 Application → Batching → Operation → Batch counter
<b>Description</b>	<p>Displays the number of batches completed since the last reset.</p> <p>The counter is automatically reset whenever the profile ("Batch profile" parameter) or the process variable assigned to the profile is changed.</p>
<b>User interface</b>	Positive integer

---


### Last fill quantity

<b>Navigation</b>	 Application → Batching → Operation → Last fill qty
<b>Description</b>	Displays the total quantity of the last batch, including drip.
<b>User interface</b>	Signed floating-point number

---

**Last drip quantity**



---

<b>Navigation</b>	 Application → Batching → Operation → Last drip qty
<b>Description</b>	Displays the drip quantity of the last batch.
<b>User interface</b>	Signed floating-point number

---

**Last filling time**



---

<b>Navigation</b>	 Application → Batching → Operation → Last fill. time
<b>Description</b>	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.
<b>User interface</b>	Positive floating-point number

---

**Last close time**



---

<b>Navigation</b>	 Application → Batching → Operation → Last close time
<b>Description</b>	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.
<b>User interface</b>	Positive floating-point number

---

**Drip correction quantity**


---

<b>Navigation</b>	 Application → Batching → Operation → Drip corr. qty
<b>Description</b>	<p>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.</p> <p>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.</p>
<b>User interface</b>	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:  $2 \cdot 10^7$  (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*

- l
- dm<sup>3</sup>
- cm<sup>3</sup>
- ml

*US units*

- ft<sup>3</sup>
  - fl oz (us)
  - gal (us)
- 

**Switch output function**

---

**Navigation**

☰ Application → Batching → Operation → SwitchOutFunc 1



☰ Application → Batching → Operation → SwitchOutFunc 2

**Description**

Assign a function to the switch output.


<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Closed</li> <li>■ Open</li> <li>■ Batching</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Closed</b> option The switch output is permanently switched on (closed, conductive).</li> <li>■ <b>Open</b> option The switch output is permanently switched off (open, non-conductive).</li> <li>■ <b>Batching</b> 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.</li> </ul>

**Switch state**


<b>Navigation</b>	<ul style="list-style-type: none"> <li> Application → Batching → Operation → Switch state 1</li> <li> Application → Batching → Operation → Switch state 2</li> </ul>
<b>Description</b>	Indicates the current switch state of the switch output.
<b>User interface</b>	<ul style="list-style-type: none"> <li>■ Open</li> <li>■ Closed</li> </ul>
<b>Additional information</b>	<p><i>User interface</i></p> <ul style="list-style-type: none"> <li>■ <b>Open</b> 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.</li> <li>■ <b>Closed</b> 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.</li> </ul>

**Batch profile**




<b>Navigation</b>	 Application → Batching → Operation → Batch profile
<b>Description</b>	Displays the profile currently in operation. Select a different profile, as required. The profile settings can be modified in the "Batch profile settings" menu.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Profile 1</li> <li>■ Profile 2</li> <li>■ Profile 3</li> <li>■ Profile 4</li> <li>■ Profile 5</li> <li>■ Profile 6</li> </ul>

## 4.7.2 Configuration

Navigation  Application → Batching → Configuration


▶ Configuration

▶ Batch profile 1 to n settings

→  56
















### 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 (→  16).

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

▶ Batch profile 1 to n settings

Assign process variable	→  57
Batch unit	→  57
Fill quantity	→  57
Measuring time drip quantity	→  58
Fixed correction quantity	→  58
Drip measurement mode	→  58
Drip correction mode	→  59
Drip median filter	→  60
Average drip correction quantity	→  60
Batch averaging	→  60
Flow rate averaging	→  61
Batch stages	→  61
Stage 2 start	→  61
Stage 2 stop	→  62
Blowout delay	→  62



Blowout duration	→ 63
Maximum batch time	→ 63
Maximum flow rate	→ 63
Drip correction quantity	→ 63

**Assign process variable**

<b>Navigation</b>	☰ Application → Batching → Configuration → Batch profile 1 to n → AssignVariab.
<b>Description</b>	Select a process variable.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Volume flow</li> </ul>

**Batch unit**



<b>Navigation</b>	☰ Application → Batching → Configuration → Batch profile 1 to n → Batch unit		
<b>Prerequisite</b>	A process variable is selected in the <b>Assign process variable</b> parameter (→ ☰ 14).		
<b>Description</b>	Select the unit.		
<b>Selection</b>	<table style="width: 100%;"> <tr> <td style="vertical-align: top;"> <i>SI units</i> <ul style="list-style-type: none"> <li>■ l<sup>*</sup></li> <li>■ dm<sup>3</sup><sup>*</sup></li> <li>■ cm<sup>3</sup><sup>*</sup></li> <li>■ ml<sup>*</sup></li> </ul> </td> <td style="vertical-align: top;"> <i>US units</i> <ul style="list-style-type: none"> <li>■ ft<sup>3</sup><sup>*</sup></li> <li>■ fl oz (us)<sup>*</sup></li> <li>■ gal (us)<sup>*</sup></li> </ul> </td> </tr> </table>	<i>SI units</i> <ul style="list-style-type: none"> <li>■ l<sup>*</sup></li> <li>■ dm<sup>3</sup><sup>*</sup></li> <li>■ cm<sup>3</sup><sup>*</sup></li> <li>■ ml<sup>*</sup></li> </ul>	<i>US units</i> <ul style="list-style-type: none"> <li>■ ft<sup>3</sup><sup>*</sup></li> <li>■ fl oz (us)<sup>*</sup></li> <li>■ gal (us)<sup>*</sup></li> </ul>
<i>SI units</i> <ul style="list-style-type: none"> <li>■ l<sup>*</sup></li> <li>■ dm<sup>3</sup><sup>*</sup></li> <li>■ cm<sup>3</sup><sup>*</sup></li> <li>■ ml<sup>*</sup></li> </ul>	<i>US units</i> <ul style="list-style-type: none"> <li>■ ft<sup>3</sup><sup>*</sup></li> <li>■ fl oz (us)<sup>*</sup></li> <li>■ gal (us)<sup>*</sup></li> </ul>		


\* Visibility depends on order options or device settings

**Fill quantity**





<b>Navigation</b>	☰ Application → Batching → Configuration → Batch profile 1 to n → Fill quantity
<b>Prerequisite</b>	A process variable is selected in the <b>Assign process variable</b> parameter (→ ☰ 14).
<b>Description</b>	Enter the fill quantity.
<b>User entry</b>	Signed floating-point number

---

**Measuring time drip quantity**



---



<b>Navigation</b>	 Application → Batching → Configuration → Batch profile 1 to n → Meas. time drip
<b>Prerequisite</b>	A process variable is selected in the <b>Assign process variable</b> parameter (→  14).
<b>Description</b>	Specify the time period over which to measure the drip quantity after the valve shut-off time is reached.
<b>User entry</b>	0.01 to 100 s

---


**Fixed correction quantity**






---

<b>Navigation</b>	 Application → Batching → Configuration → Batch profile 1 to n → Fixed corr. qty
<b>Prerequisite</b>	A process variable is selected in the <b>Assign process variable</b> parameter (→  14).
<b>Description</b>	<p>Specify the drip correction quantity to deduct from the fill quantity to determine the valve shut-off time.</p> <p>This setting only applies for the initial batch after commissioning the device or if the "Drip measurement mode" parameter is set to "Off".</p> <p>For the initial batch after commissioning, if this parameter is set to "0", the drip correction quantity is set to 10% of the fill quantity ("Fill quantity" parameter).</p>
<b>User entry</b>	Signed floating-point number

---


**Drip measurement mode**



---


<b>Navigation</b>	 Application → Batching → Configuration → Batch profile 1 to n → Drip measurement
<b>Prerequisite</b>	<p>A process variable is selected in the <b>Assign process variable</b> parameter (→  14).</p> <p>The <b>Off</b> option is not selected in the <b>Drip measurement mode</b> parameter (→  15).</p>
<b>Description</b>	<p>Select the drip measurement mode.</p> <p>Drip is measured at the end of each batch and applied to calculate the drip correction 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.</p>
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Fixed time</li> <li>■ Fixed time or low flow cut off</li> </ul>

<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Off</b> 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.</li> <li>■ <b>Fixed time</b> 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).</li> <li>■ <b>Fixed time or low flow cut off</b> 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).</li> </ul>
-------------------------------	---

---

**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 (→  14).

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





- Selection**
- Standard
  - Dynamic
  - Time-controlled

<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Standard</b> option The valve shut-off time is determined by the drip correction quantity calculated for the batch ("Drip correction quantity" parameter).</li> <li>■ <b>Dynamic</b> 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.</li> <li>■ <b>Time-controlled</b> 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.</li> </ul>
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
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<b>Drip median filter</b>		
<b>Navigation</b>		Application → Batching → Configuration → Batch profile 1 to n → Drip med. filt.
<b>Prerequisite</b>		A process variable is selected in the <b>Assign process variable</b> parameter (→  14). The <b>Off</b> option is not selected in the <b>Drip measurement mode</b> parameter (→  15).
<b>Description</b>		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.
<b>Selection</b>		<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Median 3</li> <li>■ Median 5</li> <li>■ Median 7</li> </ul>

---

<b>Average drip correction quantity</b>		
<b>Navigation</b>		Application → Batching → Configuration → Batch profile 1 to n → Avg drip correc
<b>Prerequisite</b>		A process variable is selected in the <b>Assign process variable</b> parameter (→  14). The <b>Off</b> option is not selected in the <b>Drip measurement mode</b> parameter (→  15).
<b>Description</b>		<p>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.</p> <p>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).</p> <p>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.</p>
<b>User entry</b>		1 to 100

---

<b>Batch averaging</b>		
<b>Navigation</b>		Application → Batching → Configuration → Batch profile 1 to n → Batch averaging
<b>Prerequisite</b>		The <b>Time-controlled</b> option is selected in the <b>Drip correction mode</b> parameter (→  59).
<b>Description</b>		Enter the number of batches to use in the calculation to determine the mean fill quantity-to-time ratio.
<b>User entry</b>		1 to 1 000

**Flow rate averaging**



<b>Navigation</b>	☰ Application → Batching → Configuration → Batch profile 1 to n → Flow averaging
<b>Prerequisite</b>	The <b>Dynamic</b> option is selected in the <b>Drip correction mode</b> parameter (→ ☰ 59).
<b>Description</b>	Enter the time period over which to calculate the mean flow rate.
<b>User entry</b>	Positive floating-point number

**Batch stages**



<b>Navigation</b>	☰ Application → Batching → Configuration → Batch profile 1 to n → Batch stages
<b>Prerequisite</b>	A process variable is selected in the <b>Assign process variable</b> parameter (→ ☰ 14).
<b>Description</b>	Select the number of process stages.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ One-stage</li> <li>■ Two-stage</li> <li>■ One-stage and blow out</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>One-stage</b> option Only one valve is used.</li> <li>■ <b>Two-stage</b> 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.</li> <li>■ <b>One-stage and blow out</b> option Two valves are used. The second valve is the blowout valve.</li> </ul>

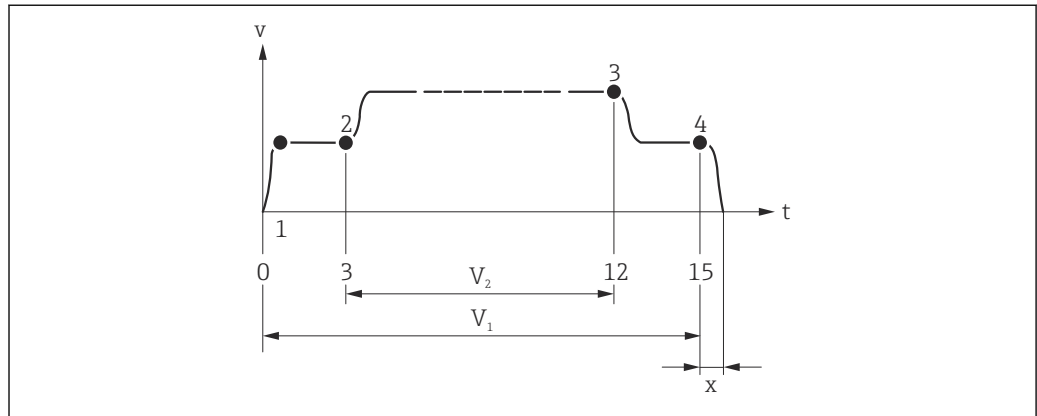
**Stage 2 start**



<b>Navigation</b>	☰ Application → Batching → Configuration → Batch profile 1 to n → Stage 2 start
<b>Prerequisite</b>	A process variable is selected in the <b>Assign process variable</b> parameter (→ ☰ 14). The <b>Two-stage</b> option is selected in the <b>Batch stages</b> parameter (→ ☰ 61).
<b>Description</b>	Enter the start quantity for opening the second valve as a % of the total fill quantity ("Fill quantity" parameter).
<b>User entry</b>	0 to 100 %
<b>Additional information</b>	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 (→ 14).  
The **Two-stage** option is selected in the **Batch stages** parameter (→ 61).

**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 (→ 14).  
The **One-stage and blow out** option is selected in the **Batch stages** parameter (→ 61).

**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**



<b>Navigation</b>	Application → Batching → Configuration → Batch profile 1 to n → Blowout durat.
<b>Prerequisite</b>	A process variable is selected in the <b>Assign process variable</b> parameter (→  14). The <b>One-stage and blow out</b> option is selected in the <b>Batch stages</b> parameter (→  61).
<b>Description</b>	Specify the blowout duration.
<b>User entry</b>	0 to 100 s

**Maximum batch time**



<b>Navigation</b>	Application → Batching → Configuration → Batch profile 1 to n → Max. batch time
<b>Prerequisite</b>	A process variable is selected in the <b>Assign process variable</b> parameter (→  14).
<b>Description</b>	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.
<b>User entry</b>	Positive floating-point number

**Maximum flow rate**



<b>Navigation</b>	Application → Batching → Configuration → Batch profile 1 to n → Max. flow rate
<b>Prerequisite</b>	A process variable is selected in the <b>Assign process variable</b> parameter (→  14).
<b>Description</b>	Enter the maximum flow rate. If the maximum flow rate is exceeded, a diagnostic message is generated.
<b>User entry</b>	Signed floating-point number

**Drip correction quantity**

<b>Navigation</b>	Application → Batching → Configuration → Batch profile 1 to n → Drip corr. qty
<b>Description</b>	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

► Modbus	
► Modbus configuration	→  65
► Modbus data map	→  67
► Modbus information	→  68

### 4.8.1 Modbus configuration

Navigation   Application → Modbus → Modbus config.

► Modbus configuration	
Bus address	→  65
Baudrate	→  65
Parity	→  66
Byte order	→  66
Telegram delay	→  67
Failure mode	→  67

#### 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

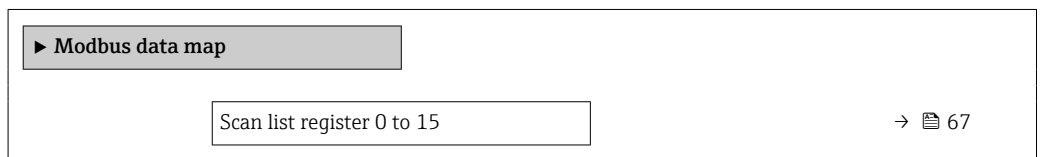
**Failure mode**



- 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

▶ Modbus information

Device ID

→  68

Device revision

→  68

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#### 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

<b>System</b>	
▶ Device management	→  70
▶ User management	→  72
▶ Date/time	→  73
▶ Information	→  74

## 5.1 Device management

Navigation   System → Device manag.

▶ **Device management**

Device tag	→  70
Locking status	→  70
Configuration counter	→  71
Device reset	→  71

---

### 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**

<b>Navigation</b>	 System → Device manag. → Config. counter
<b>Description</b>	<p>Displays the counter for the number of times the device configuration has changed.</p> <p>If the value for a static parameter changes, the counter increments by 1. This is to enable tracking different parameter versions.</p> <p>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.</p> <p>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.</p>
<b>User interface</b>	0 to 65 535

**Device reset**

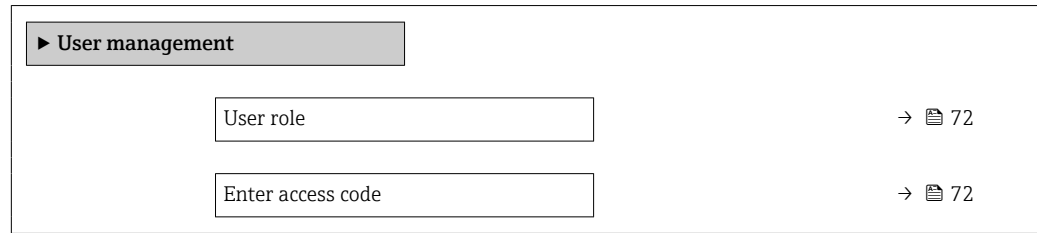


<b>Navigation</b>	 System → Device manag. → Device reset
<b>Description</b>	Reset the device configuration - either entirely or in part - to a defined state.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Cancel</li> <li>■ To delivery settings</li> <li>■ Restart device</li> <li>■ Restore S-DAT backup *</li> <li>■ Create T-DAT backup</li> <li>■ Restore T-DAT backup *</li> </ul>
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>To delivery settings</b> option Every parameter for which a customer-specific default setting was ordered is reset to the customer-specific value. All other parameters are reset to the factory setting.</li> <li>■ <b>Restart device</b> option The restart resets every parameter with data stored in volatile memory (RAM) to the factory setting (e.g. measured value data). The device configuration remains unchanged.</li> <li>■ <b>Restore S-DAT backup</b> 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.</li> <li>■ <b>Create T-DAT backup</b> option Creates T-DAT backup.</li> <li>■ <b>Restore T-DAT backup</b> 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.</li> </ul>

\* 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

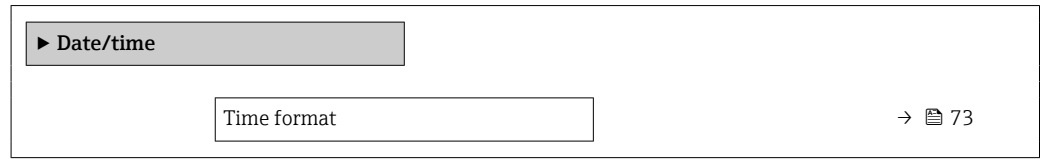
**Description** Use this function to enter the user-specific release code to remove parameter write protection.

**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: →  80











## 5.4 Information

Navigation   System → Information

▶ Information	
▶ Device	→  74
▶ Electronic module	→  77

### 5.4.1 Device

Navigation   System → Information → Device

▶ Device	
Device name	→  74
Device tag	→  75
Serial number	→  75
Order code	→  75
Firmware version	→  75
Extended order code 1	→  76
Extended order code 2	→  76
Extended order code 3	→  76
ENP version	→  76
Manufacturer	→  77

---

#### 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).

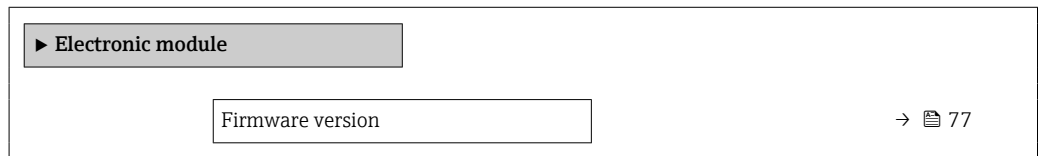
**User interface** Character string comprising numbers, letters and special characters

**Manufacturer**

<b>Navigation</b>	☰ System → Information → Device → Manufacturer
<b>Description</b>	Displays the manufacturer.
<b>User interface</b>	Character string comprising numbers, letters and special characters

**5.4.2 Electronic module**

*Navigation*      ☰☰ System → Information → Electr. module



**Firmware version**

<b>Navigation</b>	☰ System → Information → Electr. module → Firmware version
<b>Description</b>	Displays the firmware version of the module.
<b>User interface</b>	Positive integer

## 6 Country-specific factory settings


### 6.1 SI units

 Not valid for USA and Canada.

#### 6.1.1 System units

Volume	ml
Volume flow	ml/s

#### 6.1.2 On value low flow cut off

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

Nominal diameter [mm]	On value low flow cut off (v ~ 0.04 m/s) [ml/s]
4	0.5
8	2
15K <sup>1)</sup>	7
15	7
25	16

1) Conical version (corresponds to DN 12)


### 6.2 US units

 Only valid for USA and Canada.

#### 6.2.1 System units

Volume	fl oz (us)
Volume flow	fl oz/s (us)

#### 6.2.2 On value low flow cut off

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

Nominal diameter [in]	On value low flow cut off (v ~ 0.13 ft/s) [oz fl/s]
$\frac{5}{32}$	0.02
$\frac{5}{16}$	0.08
$\frac{1}{2}K$ <sup>1)</sup>	0.25

Nominal diameter [in]	On value low flow cut off (v ~ 0.13 ft/s) [oz fl/s]
½	0.25
1	0.53

1) Conical version (corresponds to DN 12)

## 7 Explanation of abbreviated units

### 7.1 SI units

Process variable	Units	Explanation
Density	g/cm <sup>3</sup> , g/m <sup>3</sup>	Gram/volume unit
	kg/dm <sup>3</sup> , kg/l, kg/m <sup>3</sup>	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).
Mass	g, kg, t	Gram, kilogram, metric ton
Mass flow	g/s, g/min, g/h, g/d	Gram/time unit
	kg/s, kg/min, kg/h, kg/d	Kilogram/time unit
	t/s, t/min, t/h, t/d	Metric ton/time unit
Temperature	°C, K	Celsius, Kelvin
Volume	cm <sup>3</sup> , dm <sup>3</sup> , m <sup>3</sup>	Cubic centimeter, cubic decimeter, cubic meter
	ml, l, hl, Ml Mega	Milliliter, liter, hectoliter, megaliter
Time	s, m, h, d, y	Second, minute, hour, day, year

### 7.2 US units

Process variable	Units	Explanation
Density	lb/ft <sup>3</sup> , 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
Mass	oz, lb, STon	Ounce, pound, standard ton
Mass flow	oz/s, oz/min, oz/h, oz/d	Ounce/time unit
	lb/s, lb/min, lb/h, lb/d	Pound/time unit
	STon/s, STon/min, STon/h, STon/d	Standard ton/time unit
Temperature	°F, °R	Fahrenheit, Rankine
Volume	af	Acre foot
	ft <sup>3</sup>	Cubic foot
	fl oz (us), gal (us), kgal (us), Mgal (us)	Fluid ounce, gallon, kilogallon, million gallon
	bbl (us;liq.), bbl (us;beer), bbl (us;oil), bbl (us;tank)	Barrel (normal liquids), barrel (beer), barrel (petrochemicals), barrel (filling tanks)
Volume flow	af/s, af/min, af/h, af/d	Acre foot/time unit
	ft <sup>3</sup> /s, ft <sup>3</sup> /min, ft <sup>3</sup> /h, ft <sup>3</sup> /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



Process variable	Units	Explanation
	Mgal/s (us), Mgal/min (us), Mgal/h (us), Mgal/d (us)	Million gallon/time unit
	bbbl/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
	bbbl/s (us;beer), bbl/min (us;beer), bbl/h (us;beer), bbl/d (us;beer)	Barrel /time unit (beer) Beer: 31.0 gal/bbl
	bbbl/s (us;oil), bbl/min (us;oil), bbl/h (us;oil), bbl/d (us;oil)	Barrel/time unit (petrochemicals) Petrochemicals: 42.0 gal/bbl
	bbbl/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
Density	lb/gal (imp), lb/bbl (imp;beer), lb/bbl (imp;oil)	Pound/volume unit
Volume	gal (imp), Mgal (imp)	Gallon, mega gallon
	bbl (imp;beer), bbl (imp;oil)	Barrel (beer), barrel (petrochemicals)
Volume flow	gal/s (imp), gal/min (imp), gal/h (imp), gal/d (imp)	Gallon/time unit
	Mgal/s (imp), Mgal/min (imp), Mgal/h (imp), Mgal/d (imp)	Mega gallon/time unit
	bbbl/s (imp;beer), bbl/min (imp;beer), bbl/h (imp;beer), bbl/d (imp;beer)	Barrel /time unit (beer) Beer: 36.0 gal/bbl
	bbbl/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	<ul style="list-style-type: none"> <li>▪ Float length = 4 byte</li> <li>▪ Integer length = 2 byte</li> <li>▪ String length, depending on parameter</li> </ul>	Possible type of access to parameter: <ul style="list-style-type: none"> <li>▪ Read access via function codes 03, 04 or 23</li> <li>▪ Write access via function codes 06, 16 or 23</li> </ul>	<b>Selection</b> List of the individual options for the parameter <ul style="list-style-type: none"> <li>▪ Option 1</li> <li>▪ <b>Option 2</b></li> <li>▪ <b>Option 3</b> <sup>(+)</sup></li> </ul>  <ul style="list-style-type: none"> <li>▪ Factory setting highlighted in bold</li> <li>▪ <sup>(+)</sup> = Factory setting depends on country, order options or device settings</li> </ul> <b>Input</b> 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.

<b>Guidance</b>	→ 91
<b>► Commissioning</b>	→ 91
<b>► Device identification</b>	→ 91
Device tag	→ 91
Serial number	→ 91
Firmware version	→ 92
Device name	→ 92
<b>► System units</b>	→ 93
Volume flow unit	→ 93
Volume unit	→ 94
Temperature unit	→ 94
<b>► Totalizer 1 to n</b>	→ 95
Assign process variable 1 to n	→ 95
Process variable unit 1 to n	→ 95
Totalizer 1 to n operation mode	→ 95
Totalizer 1 to n failure behavior	→ 95
<b>► Process</b>	→ 95
Low flow cutoff	→ 95

On value low flow cutoff	→ 95
Off value low flow cutoff	→ 95
<b>► Status input</b>	→ 96
Assign status input	→ 96
Active level	→ 96
Response time status input	→ 96
<b>► Batch profile</b>	→ 96
Assign process variable	→ 96
Batch unit	→ 96
Fill quantity	→ 96
Drip measurement mode	→ 96
<b>► Switch output</b>	→ 96
Switch output function 1	→ 96
<b>► Time format</b>	→ 96
Time format	→ 96
<b>► I/O configuration</b>	→ 97
Input/output	→ 97
Apply I/O configuration	→ 97
<b>Diagnostics</b>	→ 97
<b>► Active diagnostics</b>	→ 97
Actual diagnostics	→ 97
Timestamp	→ 97
Previous diagnostics	→ 97
Timestamp	→ 97






















Operating time from restart	→ 97
Operating time	→ 97
▶ Simulation	→ 97
Assign simulation process variable	→ 97
Process value	→ 97
Device alarm simulation	→ 97
Diagnostic event simulation	→ 97
Status input simulation	→ 97
Input signal level	→ 97
▶ Diagnostic settings	→ 98
▶ Properties	→ 98
Alarm delay	→ 98
▶ Diagnostic configuration	→ 98
▶ Configuration	→ 98
▶ Process	→ 98
Assign behavior of diagnostic no. 834	→ 98
Assign behavior of diagnostic no. 835	→ 98
Assign behavior of diagnostic no. 842	→ 98
Assign behavior of diagnostic no. 937	→ 98
Assign behavior of diagnostic no. 938	→ 98
Assign behavior of diagnostic no. 961	→ 98
Assign behavior of diagnostic no. 991	→ 98
Assign behavior of diagnostic no. 992	→ 98
Application	→ 98

▶ Measured values	→ 98
Volume flow	→ 98
Temperature	→ 98
▶ Totalizer	→ 99
Totalizer 1 to n value	→ 99
Totalizer 1 to n overflow	→ 99
▶ System units	→ 100
Volume flow unit	→ 100
Volume unit	→ 101
Temperature unit	→ 101
▶ Totalizers	→ 101
▶ Totalizer handling	→ 101
Reset all totalizers	→ 101
▶ Totalizer 1 to n	→ 102
Assign process variable 1 to n	→ 102
Process variable unit 1 to n	→ 102
Totalizer 1 to n operation mode	→ 102
Totalizer 1 to n control	→ 102
Preset value 1 to n	→ 102
Totalizer 1 to n failure behavior	→ 102
▶ Sensor	→ 102
▶ Process parameters	→ 102
Binomial filter depth	→ 102
Median filter depth	→ 102
Flow damping	→ 102

















Flow override	→  102
Coil current mode	→  103
Temperature damping time	→  103
<b>▶ Low flow cutoff</b>	→  103
Low flow cutoff	→  103
On value low flow cutoff	→  103
Off value low flow cutoff	→  103
<b>▶ Sensor adjustment</b>	→  103
Installation direction	→  103
Integration time	→  103
Measuring period	→  103
<b>▶ Zero adjustment</b>	→  103
Zero point adjustment control	→  103
Status	→  103
Progress	→  103
<b>▶ Process variable adjustment</b>	→  103
Volume flow offset	→  103
Volume flow factor	→  103
Temperature offset	→  103
Temperature factor	→  103
<b>▶ Calibration</b>	→  104
Nominal diameter	→  104
Calibration factor	→  104
Zero point	→  104

▶ Status input	→ 104
Assign status input	→ 104
Value status input	→ 104
Active level	→ 104
Response time status input	→ 104
▶ I/O configuration	→ 104
Input/output	→ 104
Apply I/O configuration	→ 104
▶ Batching	→ 104
▶ Operation	→ 104
Batch control	→ 104
Batch counter	→ 104
Last fill quantity	→ 104
Last drip quantity	→ 104
Last filling time	→ 104
Last close time	→ 104
Drip correction quantity	→ 105
Batch totalizer	→ 105
Totalizer overflow	→ 105
Batch unit	→ 105
Switch output function 1	→ 105
Switch state 1	→ 105
Switch output function 2	→ 105



Switch state 2	→  105
Batch profile	→  105
<b>► Configuration</b>	→  105
<b>► Batch profile 1 to n settings</b>	→  105
Assign process variable	→  105
Batch unit	→  105
Fill quantity	→  105
Measuring time drip quantity	→  106
Fixed correction quantity	→  106
Drip measurement mode	→  106
Drip correction mode	→  106
Drip median filter	→  106
Average drip correction quantity	→  106
Batch averaging	→  106
Flow rate averaging	→  106
Batch stages	→  106
Stage 2 start	→  107
Stage 2 stop	→  107
Blowout delay	→  107
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Maximum batch time	→  107

	Maximum flow rate	→ 107
	Drip correction quantity	→ 107
▶ Modbus		→ 108
▶ Modbus configuration		→ 108
	Bus address	→ 108
	Baudrate	→ 108
	Parity	→ 108
	Byte order	→ 108
	Telegram delay	→ 108
	Failure mode	→ 108
▶ Modbus data map		→ 108
	Scan list register 0 to 15	→ 108
▶ Modbus information		→ 108
	Device ID	→ 108
	Device revision	→ 108
System		→ 109
▶ Device management		→ 109
	Device tag	→ 109
	Locking status	→ 109
	Configuration counter	→ 109
	Device reset	→ 109
▶ User management		→ 109
	User role	→ 109
	Enter access code	→ 109


▶ Date/time	→  109
Time format	→  109
▶ Information	→  109
▶ Device	→  109
Device name	→  109
Device tag	→  109
Serial number	→  109
Order code	→  109
Firmware version	→  110
Extended order code 1	→  110
Extended order code 2	→  110
Extended order code 3	→  110
ENP version	→  110
Manufacturer	→  110
▶ Electronic module	→  110
Firmware version	→  110


## 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


Navigation: Guidance → Commissioning → Device identification					
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	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	→ 
Volume flow unit	2103	Integer	Read / Write	0 = cm <sup>3</sup> /s 1 = cm <sup>3</sup> /min 2 = cm <sup>3</sup> /h 3 = cm <sup>3</sup> /d 4 = dm <sup>3</sup> /s 5 = dm <sup>3</sup> /min 6 = dm <sup>3</sup> /h 7 = dm <sup>3</sup> /d 8 = m <sup>3</sup> /s 9 = m <sup>3</sup> /min 10 = m <sup>3</sup> /h 11 = m <sup>3</sup> /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 <sup>3</sup> /s 37 = ft <sup>3</sup> /min 38 = ft <sup>3</sup> /h 39 = ft <sup>3</sup> /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)	8


Navigation: Guidance → Commissioning → System units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
				69 = gal/min (imp) 70 = gal/h (imp) 71 = gal/d (imp) 72 = Mgal/s (imp) 73 = Mgal/min (imp) 74 = Mgal/h (imp) 75 = Mgal/d (imp) 76 = bbl/s (imp;beer) 77 = bbl/min (imp;beer) 78 = bbl/h (imp;beer) 79 = bbl/d (imp;beer) 80 = bbl/s (imp;oil) 81 = bbl/min (imp;oil) 82 = bbl/h (imp;oil) 83 = bbl/d (imp;oil) 88 = kgal/s (us) 89 = kgal/min (us) 90 = kgal/h (us) 91 = kgal/d (us)	
Volume unit	2104	Integer	Read / Write	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> 2 = m <sup>3</sup> 3 = ml 4 = l 5 = hl 6 = Ml Mega 8 = af 9 = ft <sup>3</sup> 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
Temperature unit	2109	Integer	Read / Write	0 = °C 1 = K 2 = °F 3 = °R	9

*"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 = Volume flow	10
Process variable unit 1 to n	1: 4604 2: 4605 3: 4606	Integer	Read / Write	0 = cm <sup>3</sup> * 1 = dm <sup>3</sup> * 2 = m <sup>3</sup> * 3 = ml* 4 = l* 5 = hl* 6 = Ml Mega* 8 = af* 9 = ft <sup>3</sup> * 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 <sup>3</sup> * 111 = Mft <sup>3</sup> * 251 = None*	10
Totalizer 1 to n operation mode	1: 2605 2: 2805 3: 3005	Integer	Read / Write	0 = Net 1 = Forward 2 = Reverse	11
Totalizer 1 to n failure behavior	1: 2606 2: 2806 3: 3006	Integer	Read / Write	0 = Hold 1 = Continue 2 = Last valid value + continue	11

\* Visibility depends on order options or device settings


*"Process" wizard*

Navigation: Guidance → Commissioning → Process					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
Low flow cutoff	5101	Integer	Read / Write	0 = Off 1 = Volume flow	12
On value low flow cutoff	5138 to 5139	Float	Read / Write	Positive floating-point number	12
Off value low flow cutoff	5104 to 5105	Float	Read / Write	0 to 100.0 %	13

*"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	13
Active level	2530	Integer	Read / Write	9 = Low 10 = High	14
Response time status input	3404 to 3405	Float	Read / Write	10 to 200 ms	14

*"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 = Volume flow	14
Batch unit	3530	Integer	Read / Write	0 = cm <sup>3</sup> * 1 = dm <sup>3</sup> * 3 = ml * 4 = l * 9 = ft <sup>3</sup> * 10 = fl oz (us) * 11 = gal (us) *	15
Fill quantity	3586 to 3587	Float	Read / Write	Signed floating-point number	15
Drip measurement mode	3880	Integer	Read / Write	0 = Off 1 = Fixed time 2 = Fixed time or low flow cut off	15

\* 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	16

*"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	17



*"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	17
Apply I/O configuration	8665	Integer	Read / Write	0 = Yes 1 = No	18

### 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	20
Timestamp	2719	String	Read	Days (d), hours (h), minutes (m), seconds (s)	20
Previous diagnostics	2734	Integer	Read	Positive integer	20
Timestamp	2068	String	Read	Days (d), hours (h), minutes (m), seconds (s)	21
Operating time from restart	2624	String	Read	Days (d), hours (h), minutes (m), seconds (s)	21
Operating time	2631	String	Read	Days (d), hours (h), minutes (m), seconds (s)	21

#### "Simulation" submenu


Navigation: Diagnostics → Simulation					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→
Assign simulation process variable	6813	Integer	Read / Write	0 = Off 1 = Volume flow 7 = Temperature *	22
Process value	6814 to 6815	Float	Read / Write	Signed floating-point number	22
Device alarm simulation	6812	Integer	Read / Write	0 = Off 1 = On	23
Diagnostic event simulation	4259	Integer	Read / Write	0 = Off	23
Status input simulation	2620	Integer	Read / Write	0 = Off 1 = On	23
Input signal level	2638	Integer	Read / Write	9 = Low 10 = High	23

\* Visibility depends on order options or device settings


**"Diagnostic settings" submenu***"Properties" submenu*

Navigation: Diagnostics → Diagnostic settings → Properties					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
Alarm delay	6808 to 6809	Float	Read / Write	0 to 60 s	24


*"Diagnostic configuration" submenu**"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	25
Assign behavior of diagnostic no. 835	6437	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	26
Assign behavior of diagnostic no. 842	9661	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	26
Assign behavior of diagnostic no. 937	26404	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	27
Assign behavior of diagnostic no. 938	5837	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	27
Assign behavior of diagnostic no. 961	28459	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	28
Assign behavior of diagnostic no. 991	36939	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	28
Assign behavior of diagnostic no. 992	52241	Integer	Read / Write	0 = Off 1 = Logbook entry only 2 = Warning 3 = Alarm	29


**8.3.3 "Application" menu****"Measured values" submenu**


Navigation: Application → Measured values					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
Volume flow	2007 to 2008	Float	Read	Signed floating-point number	30
Temperature	2017 to 2018	Float	Read	Positive floating-point number	31

*"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	31
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	32


## "System units" submenu

Navigation: Application → System units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
Volume flow unit	2103	Integer	Read / Write	0 = cm <sup>3</sup> /s 1 = cm <sup>3</sup> /min 2 = cm <sup>3</sup> /h 3 = cm <sup>3</sup> /d 4 = dm <sup>3</sup> /s 5 = dm <sup>3</sup> /min 6 = dm <sup>3</sup> /h 7 = dm <sup>3</sup> /d 8 = m <sup>3</sup> /s 9 = m <sup>3</sup> /min 10 = m <sup>3</sup> /h 11 = m <sup>3</sup> /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 <sup>3</sup> /s 37 = ft <sup>3</sup> /min 38 = ft <sup>3</sup> /h 39 = ft <sup>3</sup> /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)	33


Navigation: Application → System units					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
				69 = gal/min (imp) 70 = gal/h (imp) 71 = gal/d (imp) 72 = Mgal/s (imp) 73 = Mgal/min (imp) 74 = Mgal/h (imp) 75 = Mgal/d (imp) 76 = bbl/s (imp;beer) 77 = bbl/min (imp;beer) 78 = bbl/h (imp;beer) 79 = bbl/d (imp;beer) 80 = bbl/s (imp;oil) 81 = bbl/min (imp;oil) 82 = bbl/h (imp;oil) 83 = bbl/d (imp;oil) 88 = kgal/s (us) 89 = kgal/min (us) 90 = kgal/h (us) 91 = kgal/d (us)	
Volume unit	2104	Integer	Read / Write	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> 2 = m <sup>3</sup> 3 = ml 4 = l 5 = hl 6 = Ml Mega 8 = af 9 = ft <sup>3</sup> 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)	34
Temperature unit	2109	Integer	Read / Write	0 = °C 1 = K 2 = °F 3 = °R	35

**"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	36


*"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 = Volume flow	37
Process variable unit 1 to n	1: 4604 2: 4605 3: 4606	Integer	Read / Write	0 = cm <sup>3</sup> * 1 = dm <sup>3</sup> * 2 = m <sup>3</sup> * 3 = ml * 4 = l * 5 = hl * 6 = Ml Mega * 8 = af * 9 = ft <sup>3</sup> * 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 <sup>3</sup> * 111 = Mft <sup>3</sup> * 251 = None *	37
Totalizer 1 to n operation mode	1: 2605 2: 2805 3: 3005	Integer	Read / Write	0 = Net 1 = Forward 2 = Reverse	38
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	38
Preset value 1 to n	1: 2590 to 2591 2: 2592 to 2593 3: 2594 to 2595	Float	Read / Write	Signed floating-point number	39
Totalizer 1 to n failure behavior	1: 2606 2: 2806 3: 3006	Integer	Read / Write	0 = Hold 1 = Continue 2 = Last valid value + continue	39


\* 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	→ 
Binomial filter depth	2369	Integer	Read / Write	0 to 32	40
Median filter depth	2431	Integer	Read / Write	0 to 32	41
Flow damping	3394 to 3395	Float	Read / Write	0.0 to 100.0 s	41
Flow override	5503	Integer	Read / Write	0 = Off 1 = On	41

Navigation: Application → Sensor → Process parameters					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
Coil current mode	38236	Integer	Read / Write	0 = Standard 1 = Low 8 = Automatic	42
Temperature damping time	37236 to 37237	Float	Read / Write	0 to 999.9 s	42


*"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 = Volume flow	43
On value low flow cutoff	5138 to 5139	Float	Read / Write	Positive floating-point number	43
Off value low flow cutoff	5104 to 5105	Float	Read / Write	0 to 100.0 %	43


*"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	44
Integration time	2260 to 2261	Float	Read / Write	1 to 65 ms	44
Measuring period	2852 to 2853	Float	Read / Write	0 to 1000 ms	44


*"Zero adjustment" submenu*

Navigation: Application → Sensor → Sensor adjustment → Zero adjustment					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
Zero point adjustment control	36961	Integer	Read / Write	0 = Cancel 1 = Start	45
Status	33812	Integer	Read	2 = Failed 5 = Done 8 = Busy	45
Progress	6797	Integer	Read	0 to 100 %	45


*"Process variable adjustment" submenu*

Navigation: Application → Sensor → Sensor adjustment → Process variable adjustment					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
Volume flow offset	5521 to 5522	Float	Read / Write	Signed floating-point number	46
Volume flow factor	5519 to 5520	Float	Read / Write	Positive floating-point number	46
Temperature offset	5533 to 5534	Float	Read / Write	Signed floating-point number	46
Temperature factor	5531 to 5532	Float	Read / Write	Positive floating-point number	47


*"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	47
Calibration factor	2313 to 2314	Float	Read	Positive floating-point number	48
Zero point	2870 to 2871	Float	Read	Signed floating-point number	48


*"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	48
Value status input	2746	Integer	Read	9 = Low 10 = High	49
Active level	2530	Integer	Read / Write	9 = Low 10 = High	49
Response time status input	3404 to 3405	Float	Read / Write	10 to 200 ms	50


*"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	50
Apply I/O configuration	8665	Integer	Read / Write	0 = Yes 1 = No	51

*"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	52
Batch counter	3520	Integer	Read	Positive integer	52
Last fill quantity	2844 to 2845	Float	Read	Signed floating-point number	52
Last drip quantity	3238 to 3239	Float	Read	Signed floating-point number	53
Last filling time	2992 to 2993	Float	Read	Positive floating-point number	53
Last close time	2994 to 2995	Float	Read	Positive floating-point number	53





Navigation: Application → Batching → Operation					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
Drip correction quantity	3240 to 3241	Float	Read	Signed floating-point number	53
Batch totalizer	3262 to 3263	Float	Read	Signed floating-point number	54
Totalizer overflow	3552 to 3553	Float	Read	-32 000.0 to 32 000.0	54
Batch unit	21295	Integer	Read	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> 3 = ml 4 = l 9 = ft <sup>3</sup> 10 = fl oz (us) 11 = gal (us)	54
Switch output function 1	2488	Integer	Read / Write	0 = Batching 1 = Open 2 = Closed	54
Switch state 1	3518	Integer	Read	1 = Open 2 = Closed	55
Switch output function 2	2489	Integer	Read / Write	0 = Batching 1 = Open 2 = Closed	54
Switch state 2	3519	Integer	Read	1 = Open 2 = Closed	55
Batch profile	3000	Integer	Read / Write	0 = Profile 1 1 = Profile 2 2 = Profile 3 3 = Profile 4 4 = Profile 5 5 = Profile 6	55

*"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 = Volume flow	57
Batch unit	1: 3530 2: 3531 3: 3532 4: 3533 5: 3534 6: 3535	Integer	Read / Write	0 = cm <sup>3</sup> * 1 = dm <sup>3</sup> * 3 = ml* 4 = l* 9 = ft <sup>3</sup> * 10 = fl oz (us)* 11 = gal (us)*	57
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	57

Navigation: Application → Batching → Configuration → Batch profile 1 to n settings					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
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	58
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	58
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	58
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	59
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	60
Average drip correction quantity	1: 3658 2: 3659 3: 3660 4: 3661 5: 3662 6: 3663	Integer	Read / Write	1 to 100	60
Batch averaging	1: 25292 2: 25293 3: 25294 4: 25295 5: 25296 6: 25297	Integer	Read / Write	1 to 1000	60
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	61
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	61


Navigation: Application → Batching → Configuration → Batch profile 1 to n settings					
Parameter	Register	Data type	Access	Selection / User entry / User interface	→ 
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 %	61
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 %	62
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	62
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	63
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	63
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	63
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	63

\* 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	65
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	65
Parity	4914	Integer	Read / Write	0 = Even 1 = Odd 2 = None / 2 stop bits 3 = None / 1 stop bit	66
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	66
Telegram delay	4916 to 4917	Float	Read / Write	0 to 100 ms	67
Failure mode	4920	Integer	Read / Write	0 = NaN value 1 = Last valid value	67

*"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	67

*"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	68
Device revision	4481	Integer	Read	0 to 65 535	68


### 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)	70
Locking status	4918	Integer	Read	512 = Temporarily locked	70
Configuration counter	4818	Integer	Read	0 to 65535	71
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	71

\* 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	72
Enter access code	2177	Integer	Read / Write	Max. 16-digit character string comprising numbers, letters and special characters	72


#### "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	73


#### "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	74
Device tag	2026 to 2041	String	Read / Write	Character string comprising numbers, letters and special characters (32)	75
Serial number	7003 to 7008	String	Read	Character string comprising numbers, letters and special characters	75
Order code	2058 to 2067	String	Read	Character string comprising numbers, letters and special characters	75

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	75
Extended order code 1	2212 to 2221	String	Read	Character string comprising numbers, letters and special characters	76
Extended order code 2	2222 to 2231	String	Read	Character string comprising numbers, letters and special characters	76
Extended order code 3	2232 to 2241	String	Read	Character string comprising numbers, letters and special characters	76
ENP version	4003 to 4010	String	Read	Character string comprising numbers, letters and special characters	76
Manufacturer	8001 to 8016	String	Read	Character string comprising numbers, letters and special characters	77

*"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	77

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