

# Special documentation

## **Dosimass**

Register information Modbus RS485



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# 1 Document information

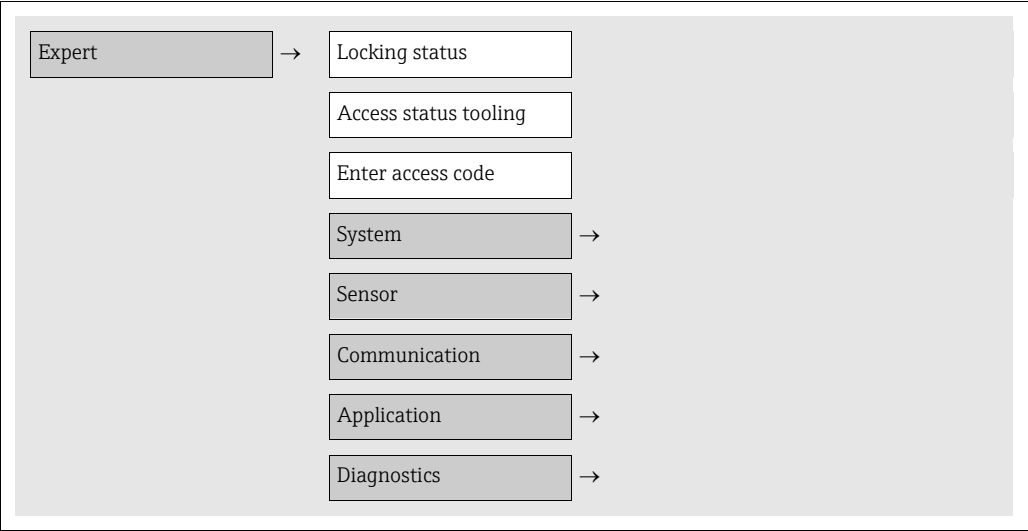
## 1.1 Document function

This document is part of the Operating Instructions for LNGmass Modbus RS485 and extends these with Modbus specific information about each parameter.

## 1.2 Using this document


### 1.2.1 Information on the document structure

The document lists the submenus and their parameters according to the structure from the Expert menu.



### 1.2.2 Structure of a parameter description

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

Navigation: Navigation path to the parameter				
Parameter	Register	Data type	Access	Options/User entry
Complete parameter name	Information in decimal numerical format	<ul style="list-style-type: none"> <li>Float Length = 4 bytes</li> <li>Integer Length = 2 bytes</li> <li>String Length depends on function</li> </ul>	Possible ways of accessing the function: <ul style="list-style-type: none"> <li>Read Read access via function code 03, 04 or 23</li> <li>Write Write access via function code 06, 16 or 23</li> </ul>	Options List of the individual options for the parameter <ul style="list-style-type: none"> <li>Option 1</li> <li>Option 2 (Default)</li> <li>Option 3 (Default)*</li> </ul> <div>  <b>Note!</b> <ul style="list-style-type: none"> <li>– Default setting emphasized and marked with "Default"</li> <li>– * = Default setting depends on country and device properties</li> </ul> </div> User entry Input range for the parameter



#### Note!

If a nonvolatile device parameter is modified via the Modbus RS485 function codes 06, 16 or 23, this change is saved in the HistoROM of the measuring device. The number of writes to the HistoROM is technically restricted to a maximum of 1 million. Attention must be paid to this limit since, if exceeded, it results in data loss and measuring device failure. For this reason, avoid constantly writing nonvolatile device parameters via the Modbus RS485!

### 1.2.3 Modbus RS485 register address model

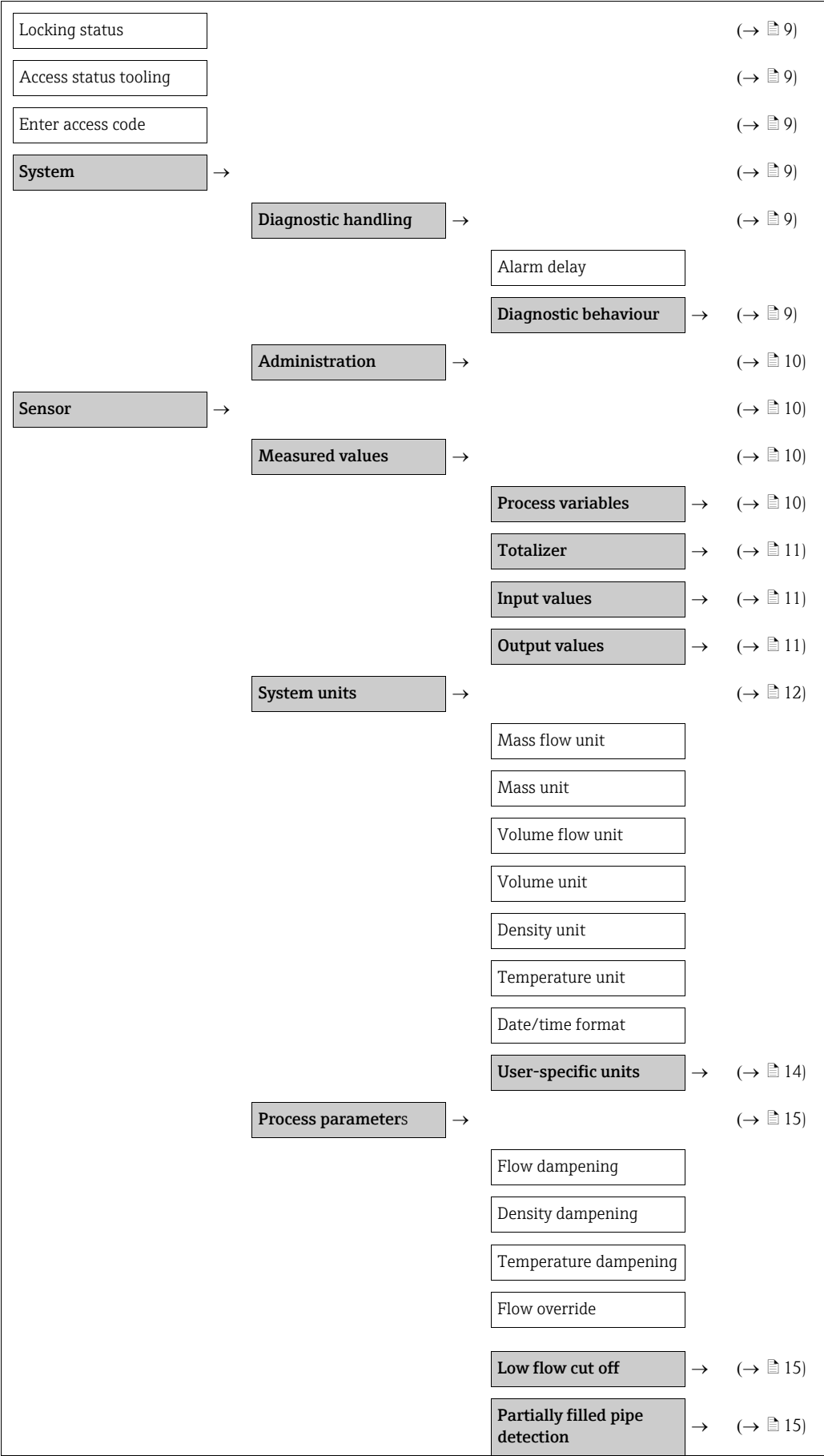
The Modbus RS485 register addresses of the measuring device are implemented in accordance with "Modbus Applications Protocol Specification V1.1".

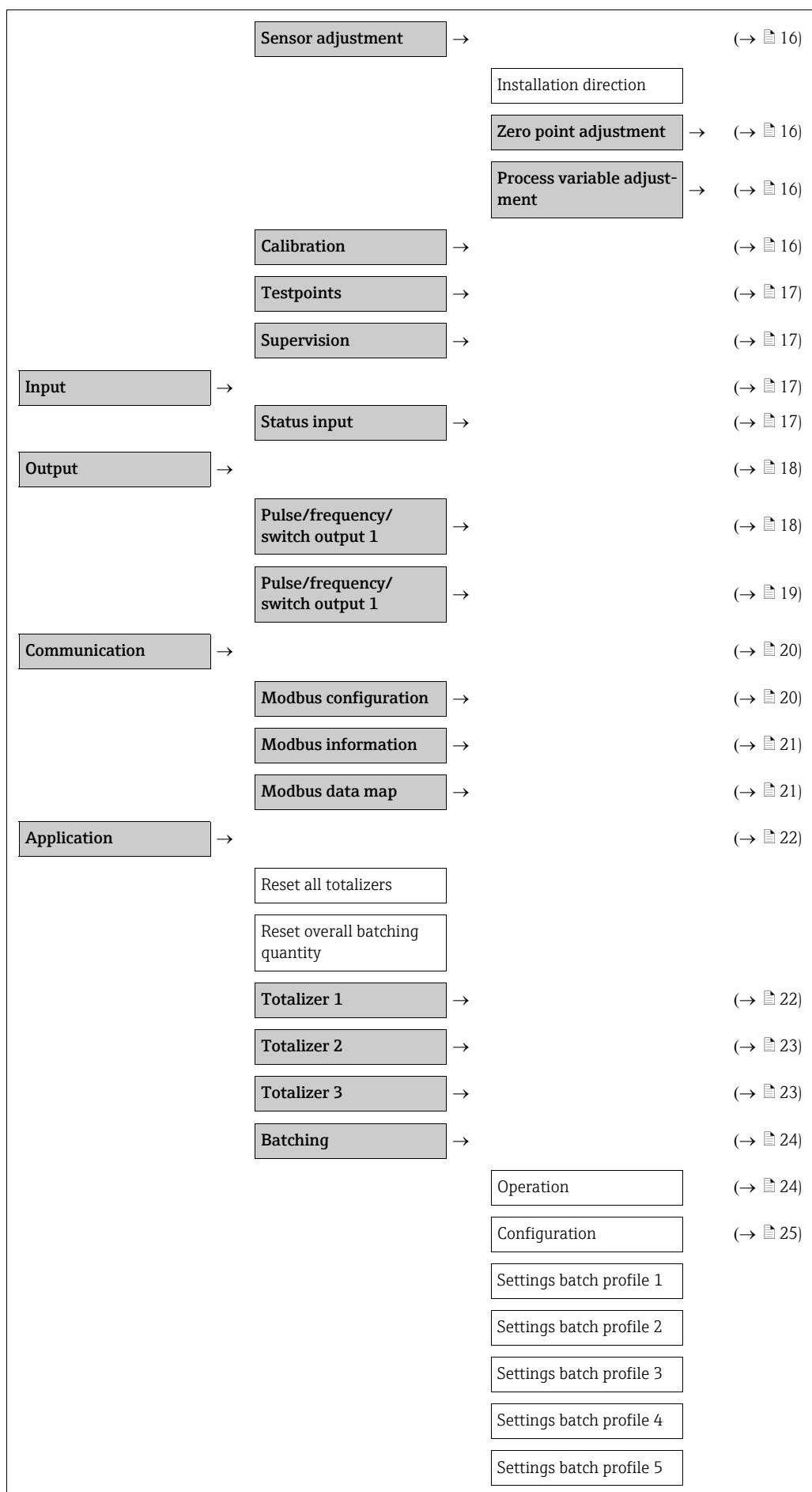
In addition, also systems are deployed which work with the register address model "Modicon Modbus Protocol Reference Guide (PI-MBUS-300 Rev. J)". Depending on the used function code, the register address is extended with a prefix number in this specification:

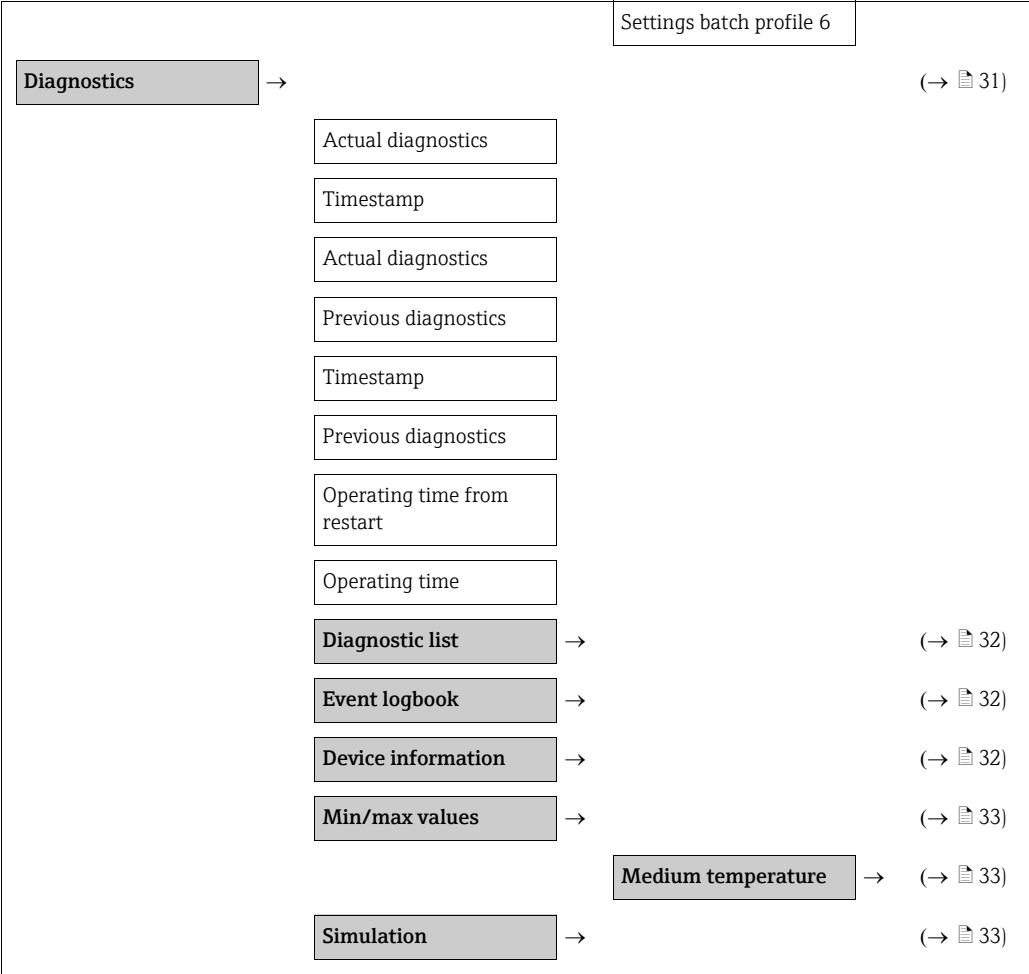
- "3" → Access type "Read"
- "4" → Access type "Write"

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

## 2 Overview of the operating menu "Expert"









### 3 Modbus RS485 parameter information

Navigation: Expert				
Parameter	Register	Data type	Access	Selection/Default
Locking status	4918	Integer	Read	256 = Hardware locked 512 = Temporarily locked
Access status tooling	2178	Integer	Read	0 = Operator <b>1 = Maintenance (Default)</b> 2 = Service 3 = Production 4 = Development
Enter access code	2177	Integer	Read/write	0...9999

#### 3.1 Sub-menu "System"

##### 3.1.1 Sub-menu "Diagnostic handling"

Navigation: Expert → System → Diagnostic handling				
Parameter	Register	Data type	Access	Selection/Default
Alarm delay	6808	Float	Read/write	0...60

##### Sub-menu "Diagnostic behavior"

Navigation: Expert → System → Diagnostic handling → Diagnostic behavior				
Parameter	Register	Data type	Access	Selection/Default
Assign behavior of diagnostic no. 140	2757	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm
Assign behavior of diagnostic no. 046	2756	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm
Assign behavior of diagnostic no. 834	2761	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm
Assign behavior of diagnostic no. 835	2760	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm
Assign behavior of diagnostic no. 912	2758	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm
Assign behavior of diagnostic no. 913	2754	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm
Assign behavior of diagnostic no. 192	2022	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm

Navigation: Expert → System → Diagnostic handling → Diagnostic behavior				
Parameter	Register	Data type	Access	Selection/Default
Assign behavior of diagnostic no. 274	2755	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm
Assign behavior of diagnostic no. 392	2023	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm
Assign behavior of diagnostic no. 442	2596	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm
Assign behavior of diagnostic no. 443	2597	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm
Assign behavior of diagnostic no. 592	2024	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm
Assign behavior of diagnostic no. 992	2021	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm
Assign behavior of diagnostic no. 991	2809	Integer	Read/write	0 = Off 1 = Logbook entry only <b>2 = Warning (Default)</b> 3 = Alarm

### 3.1.2 Sub-menu "Administration"

Navigation: Expert → System → Administration				
Parameter	Register	Data type	Access	Selection/Default
Device reset	6817	Integer	Read/write	<b>0 = Cancel (Default)</b> 1 = Restart device 2 = To delivery settings
Permanent storage	6907	Integer	Read/write	0 = Off <b>1 = On (Default)</b>
Device tag	4901	String	Read/write	

## 3.2 Sub-menu "Sensor"

### 3.2.1 Sub-menu "Measured values"

#### Sub-menu "Process variables"

Navigation: Expert → Sensor → Measured values → Process variables				
Parameter	Register	Data type	Access	Selection/Default
Mass flow	2007	Float	Read	
Volume flow	2009	Float	Read	
Density	2013	Float	Read	

Navigation: Expert → Sensor → Measured values → Process variables				
Parameter	Register	Data type	Access	Selection/Default
Temperature	2017	Float	Read	

### Sub-menu "Totalizer"

Navigation: Expert → Sensor → Measured values → Totalizer				
Parameter	Register	Data type	Access	Selection/Default
Totalizer value 1	2610	Float	Read	
Totalizer overflow 1	2612	Float	Read	-32000.0...32000.0
Totalizer value 2	2810	Float	Read	
Totalizer overflow 2	2812	Float	Read	-32000.0...32000.0
Totalizer value 3	3010	Float	Read	
Totalizer overflow 3	3012	Float	Read	-32000.0...32000.0

### Sub-menu "Input values"

Navigation: Expert → Sensor → Measured values → Input values				
Parameter	Register	Data type	Access	Selection/Default
Value status input	2746	Integer	Read	<b>0 = Low (Default)</b> 1 = High

### Sub-menu "Output values"

Navigation: Expert → Sensor → Measured values → Output values				
Parameter	Register	Data type	Access	Selection/Default
Pulse output	3082	Float	Read	
Output frequency	3462	Float	Read	
Switch status	2485	Integer	Read	<b>1 = Open (Default)</b> 2 = Closed
Output frequency	3464	Float	Read	
Pulse output	3084	Float	Read	
Switch status	2486	Integer	Read	<b>1 = Open (Default)</b> 2 = Closed

### 3.2.2 Sub-menu "System units"

Navigation: Expert → Sensor → System units				
Parameter	Register	Data type	Access	Selection/Default
Mass flow unit	2101	Integer	Read/write	0 = g/s 1 = g/min 2 = g/h 3 = g/d 4 = kg/s 5 = kg/min <b>6 = kg/h (Default)*</b> 7 = kg/d 8 = t/s 9 = t/min 10 = t/h 11 = t/d 12 = oz/s 13 = oz/min 14 = oz/h 15 = oz/d 16 = lb/s 17 = lb/min 18 = lb/h 19 = lb/d 20 = STon/s 21 = STon/min 22 = STon/h 23 = STon/d 24 = User mass/s 25 = User mass/min 26 = User mass/h 27 = User mass/d
Mass unit	2102	Integer	Read/write	2 = t 5 = STon 6 = User mass 12 = g <b>13 = kg (Default)*</b> 14 = oz 15 = lb
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 <b>18 = l/h (Default)*</b> 19 = l/d 20 = hl/s 21 = hl/min 22 = hl/h 23 = hl/d 24 = Ml/s 25 = Ml/min

Navigation: Expert → Sensor → System units				
Parameter	Register	Data type	Access	Selection/Default
				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) 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) 84 = User vol./s 85 = User vol./min 86 = User vol./h 87 = User vol./d 88 = kgal/s (us) 89 = kgal/min (us) 90 = kgal/h (us) 91 = kgal/d (us)

Navigation: Expert → Sensor → System units				
Parameter	Register	Data type	Access	Selection/Default
Volume unit	2104	Integer	Read/write	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> <b>2 = m<sup>3</sup> (Default)*</b> 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) 21 = User vol. 22 = kgal (us)
Density unit	2107	Integer	Read/write	0 = g/cm <sup>3</sup> 2 = kg/dm <sup>3</sup> <b>3 = kg/l (Default)*</b> 4 = kg/m <sup>3</sup> 5 = SD4°C 6 = SD15°C 7 = SD20°C 8 = SG4°C 9 = SG15°C 10 = SG20°C 11 = lb/ft <sup>3</sup> 12 = lb/gal (us) 13 = lb/bbl (us;liq.) 14 = lb/bbl (us;beer) 15 = lb/bbl (us;oil) 16 = lb/bbl (us;tank) 17 = lb/gal (imp) 18 = lb/bbl (imp;beer) 19 = lb/bbl (imp;oil) 20 = User dens. 21 = g/m <sup>3</sup> 22 = g/ml
Temperature unit	2109	Integer	Read/write	<b>0 = °C (Default)*</b> 1 = K 2 = °F 3 = °R
Date/time format	2150	Integer	Read/write	<b>0 = dd.mm.yy hh:mm (Default)</b> 1 = mm/dd/yy hh:mm am/pm 2 = dd.mm.yy hh:mm am/pm 3 = mm/dd/yy hh:mm

## Sub-menu "User-specific units"

Navigation: Expert → Sensor → System units → User-specific units				
Parameter	Register	Data type	Access	Selection/Default
User mass text	2531	String	Read/write	
User mass factor	2115	Float	Read/write	Floating-point number with sign
User volume text	2542	String	Read/write	

Navigation: Expert → Sensor → System units → User-specific units				
Parameter	Register	Data type	Access	Selection/Default
User volume factor	2119	Float	Read/write	Floating-point number with sign
User density text	2549	String	Read/write	
User density offset	2556	Float	Read/write	Floating-point number with sign
User density factor	2123	Float	Read/write	Floating-point number with sign

### 3.2.3 Sub-menu "Process parameters"

Navigation: Expert → Sensor → Process parameters				
Parameter	Register	Data type	Access	Selection/Default
Flow damping	5510	Float	Read/write	0...100.0
Density damping	5508	Float	Read/write	0...999.9
Temperature damping	5127	Float	Read/write	0...999.9
Flow override	5503	Integer	Read/write	<b>0 = Off (Default)</b> 1 = On

#### Sub-menu "Low flow cut off"

Navigation: Expert → Sensor → Process parameters → Low flow cut off				
Parameter	Register	Data type	Access	Selection/Default
Assign process variable	5101	Integer	Read/write	0 = Off <b>1 = Mass flow (Default)</b> 2 = Volume flow
On value low flow cutoff	5138	Float	Read/write	
Off value low flow cutoff	5104	Float	Read/write	0...100.0
Pressure shock suppression	5140	Float	Read/write	0...100

#### Sub-menu "Partially filled pipe detection"

Navigation: Expert → Sensor → Process parameters → Partially filled pipe detection				
Parameter	Register	Data type	Access	Selection/Default
Assign process variable	5106	Integer	Read/write	<b>0 = Off (Default)</b> 4 = Density
Low value partial filled pipe detection	5110	Float	Read/write	
High value partial filled pipe detection	5112	Float	Read/write	
Response time part. filled pipe detect.	5108	Float	Read/write	0...100
Maximum damping partial filled pipe det.	2414	Float	Read/write	Positive floating-point number

### 3.2.4 Sub-menu "Sensor adjustment"

Navigation: Expert → Sensor → Sensor adjustment				
Parameter	Register	Data type	Access	Selection/Default
Installation direction	5501	Integer	Read/write	<b>0 = Flow in arrow direction (Default)</b> 1 = Flow against arrow direction

### Sub-menu "Zero point adjustment"

Navigation: Expert → Sensor → Sensor adjustment → Zero point adjustment				
Parameter	Register	Data type	Access	Selection/Default
Zero point adjustment control	5121	Integer	Read/write	<b>0 = Cancel (Default)</b> 1 = Start 2 = Zero point adjust failure 8 = Busy
Progress	6797	Integer	Read	

### Sub-menu "Process variable adjustment"

Navigation: Expert → Sensor → Sensor adjustment → Process variable adjustment				
Parameter	Register	Data type	Access	Selection/Default
Mass flow offset	5521	Float	Read/write	Floating-point number with sign
Mass flow factor	5519	Float	Read/write	Positive floating-point number
Volume flow offset	5525	Float	Read/write	Floating-point number with sign
Volume flow factor	5523	Float	Read/write	Positive floating-point number
Density offset	5529	Float	Read/write	Floating-point number with sign
Density factor	5527	Float	Read/write	Positive floating-point number
Temperature offset	5533	Float	Read/write	Floating-point number with sign
Temperature factor	5531	Float	Read/write	Positive floating-point number

### 3.2.5 Sub-menu "Calibration"

Navigation: Expert → Sensor → Calibration				
Parameter	Register	Data type	Access	Selection/Default
Calibration factor	7513	Float	Read	Floating-point number with sign
Zero point	7527	Float	Read/write	Floating-point number with sign
Nominal diameter	2048	String	Read	
C0	7501	Float	Read	Floating-point number with sign
C1	7503	Float	Read	Floating-point number with sign
C2	7505	Float	Read	Floating-point number with sign
C3	7507	Float	Read	Floating-point number with sign
C4	7509	Float	Read	Floating-point number with sign
C5	7511	Float	Read	Floating-point number with sign



### 3.2.6 Sub-menu "Testpoints"

Navigation: Expert → Sensor → Testpoints				
Parameter	Register	Data type	Access	Selection/Default
Oscillation frequency 0	9501	Float	Read	
Oscillation frequency 1	9503	Float	Read	
Frequency fluctuation 0	2498	Float	Read	
Frequency fluctuation 1	2500	Float	Read	
Oscillation amplitude 0	2449	Float	Read	
Oscillation amplitude 1	2451	Float	Read	
Oscillation damping 0	9505	Float	Read	
Oscillation damping 1	9507	Float	Read	
Tube damping fluctuation 0	2502	Float	Read	
Tube damping fluctuation 1	2504	Float	Read	
Signal asymmetry	2443	Float	Read	
Exciter current 0	9509	Float	Read	
Exciter current 1	9511	Float	Read	
RawMassFlow	10232	Float	Read	

### 3.2.7 Sub-menu "Supervision"

Navigation: Expert → Sensor → Supervision				
Parameter	Register	Data type	Access	Selection/Default
Limit value measuring tube damping	4333	Float	Read/write	Positive floating-point number

## 3.3 Sub-menu "Input"

### 3.3.1 Sub-menu "Status input"

Navigation: Expert → Input → Status input				
Parameter	Register	Data type	Access	Selection/Default
Assign status input	2506	Integer	Read/write	<b>0 = Off (Default)</b> 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
Value status input	2746	Integer	Read	<b>0 = Low (Default)</b> 1 = High
Active level	2530	Integer	Read/write	0 = Low <b>1 = High (Default)</b>
Response time status input	3404	Float	Read/write	

## 3.4 Sub-menu "Output"

### 3.4.1 Sub-menu "Pulse/frequency/switch output 1"

Navigation: Expert → Output → Pulse/frequency/switch output 1				
Parameter	Register	Data type	Access	Selection/Default
Operating mode	4479	Integer	Read/write	0 = Off 1 = Switch <b>2 = Pulse (Default)</b> 3 = Automatic pulse 12 = Frequency
Channel 2	2658	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Redundant 0° 2 = Redundant 90° 3 = Redundant 180°
Assign pulse output	2461	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Mass flow 2 = Volume flow
Value per pulse	3034	Float	Read/write	
Pulse width	2836	Float	Read/write	
Measuring mode	2394	Integer	Read/write	<b>0 = Forward flow (Default)</b> 1 = Reverse flow 13 = Forward/Reverse flow
Failure mode	2948	Integer	Read/write	<b>0 = Actual value (Default)</b> 1 = No pulses
Pulse output	3082	Float	Read	
Assign frequency output	2614	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Mass flow 2 = Volume flow 4 = Density 7 = Temperature
Minimum frequency value	3526	Float	Read/write	
Maximum frequency value	2996	Float	Read/write	
Measuring value at maximum frequency	3514	Float	Read/write	
Measuring mode	2922	Integer	Read/write	<b>0 = Forward flow (Default)</b> 1 = Reverse flow 13 = Forward/Reverse flow
Damping output	3522	Float	Read/write	
Failure mode	2367	Integer	Read/write	0 = Actual value <b>1 = 0 Hz (Default)</b> 2 = Defined value
Failure frequency	3510	Float	Read/write	
Output frequency	3462	Float	Read	
Switch output function	3022	Integer	Read/write	<b>0 = Off (Default)</b> 1 = On 2 = Diagnostic behavior 3 = Flow direction check 4 = Limit 5 = Status
Assign diagnostic behavior	3096	Integer	Read/write	<b>0 = Alarm (Default)</b> 1 = Warning 2 = Alarm or warning

Navigation: Expert → Output → Pulse/frequency/switch output 1				
Parameter	Register	Data type	Access	Selection/Default
Assign limit	3184	Integer	Read/write	1 = Mass flow <b>2 = Volume flow (Default)</b> 4 = Density 7 = Temperature
Switch-on value	3242	Float	Read/write	
Switch-off value	3234	Float	Read/write	
Assign flow direction check	3363	Integer	Read/write	0 = Off 1 = Mass flow <b>2 = Volume flow (Default)</b>
Assign status	3374	Integer	Read/write	<b>0 = Low flow cut off (Default)</b> 1 = Partially filled pipe detection
Failure mode	3384	Integer	Read/write	0 = Actual status <b>1 = Open (Default)</b> 2 = Closed
Switch status	2485	Integer	Read	<b>1 = Open (Default)</b> 2 = Closed
Invert output signal	2583	Integer	Read/write	<b>0 = Yes (Default)</b> 1 = No

### 3.4.2 Sub-menu "Pulse/frequency/switch output 2"

Navigation: Expert → Output → Pulse/frequency/switch output 2				
Parameter	Register	Data type	Access	Selection/Default
Operating mode	4480	Integer	Read/write	0 = Off 1 = Switch <b>2 = Pulse (Default)</b> 3 = Automatic pulse 12 = Frequency
Channel 2	2659	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Redundant 0° 2 = Redundant 90° 3 = Redundant 180°
Assign pulse output	2462	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Mass flow 2 = Volume flow
Value per pulse	3036	Float	Read/write	
Pulse width	2838	Float	Read/write	
Measuring mode	2395	Integer	Read/write	<b>0 = Forward flow (Default)</b> 1 = Reverse flow 13 = Forward/Reverse flow
Failure mode	2949	Integer	Read/write	<b>0 = Actual value (Default)</b> 1 = No pulses
Pulse output	3084	Float	Read	
Assign frequency output	2615	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Mass flow 2 = Volume flow 4 = Density 7 = Temperature
Minimum frequency value	3528	Float	Read/write	
Maximum frequency value	2998	Float	Read/write	
Measuring value at maximum frequency	3516	Float	Read/write	

Navigation: Expert → Output → Pulse/frequency/switch output 2				
Parameter	Register	Data type	Access	Selection/Default
Measuring mode	2923	Integer	Read/write	<b>0 = Forward flow (Default)</b> 1 = Reverse flow 13 = Forward/Reverse flow
Damping output	3524	Float	Read/write	
Failure mode	2368	Integer	Read/write	0 = Actual value <b>1 = 0 Hz (Default)</b> 2 = Defined value
Failure frequency	3512	Float	Read/write	
Output frequency	3464	Float	Read	
Switch output function	3023	Integer	Read/write	<b>0 = Off (Default)</b> 1 = On 2 = Diagnostic behavior 3 = Flow direction check 4 = Limit 5 = Status
Assign diagnostic behavior	3097	Integer	Read/write	<b>0 = Alarm (Default)</b> 1 = Warning 2 = Alarm or warning
Assign limit	3185	Integer	Read/write	1 = Mass flow <b>2 = Volume flow (Default)</b> 4 = Density 7 = Temperature
Switch-on value	3244	Float	Read/write	
Switch-off value	3236	Float	Read/write	
Assign flow direction check	3364	Integer	Read/write	0 = Off 1 = Mass flow <b>2 = Volume flow (Default)</b>
Assign status	3375	Integer	Read/write	<b>0 = Low flow cut off (Default)</b> 1 = Partially filled pipe detection
Failure mode	3385	Integer	Read/write	0 = Actual status <b>1 = Open (Default)</b> 2 = Closed
Switch status	2486	Integer	Read	<b>1 = Open (Default)</b> 2 = Closed
Invert output signal	2584	Integer	Read/write	<b>0 = Yes (Default)</b> 1 = No

## 3.5 Sub-menu "Communication"

### 3.5.1 Sub-menu "Modbus configuration"

Navigation: Expert → Communication → Modbus configuration				
Parameter	Register	Data type	Access	Selection/Default
Bus address	4910	Integer	Read/write	1...247
Baudrate	4912	Integer	Read/write	0 = 1200 BAUD 1 = 2400 BAUD 2 = 4800 BAUD 3 = 9600 BAUD <b>4 = 19200 BAUD (Default)</b> 5 = 38400 BAUD 6 = 57600 BAUD 7 = 115200 BAUD

Navigation: Expert → Communication → Modbus configuration				
Parameter	Register	Data type	Access	Selection/Default
Data transfer mode	4913	Integer	Read/write	<b>0 = RTU (Default)</b> 1 = ASCII
Parity	4914	Integer	Read/write	<b>0 = Even (Default)</b> 1 = Odd 2 = None / 2 stop bits 3 = None / 1 stop bit
Byte order	4915	Integer	Read/write	0 = 0-1-2-3 1 = 3-2-1-0 2 = 2-3-0-1 <b>3 = 1-0-3-2 (Default)</b>
Telegram delay	4916	Float	Read/write	0...100
Assign diagnostic behavior	4921	Integer	Read/write	0 = Off 1 = Warning <b>2 = Alarm (Default)</b> 3 = Alarm or warning
Failure mode	4920	Integer	Read/write	<b>0 = NaN value (Default)</b> 1 = Last valid value
Interpreter mode	4925	Integer	Read/write	<b>0 = Standard (Default)</b> 1 = Ignore surplus bytes

### 3.5.2 Sub-menu "Modbus information"

Navigation: Expert → Communication → Modbus information				
Parameter	Register	Data type	Access	Selection/Default
Device ID	2547	Integer	Read	
Device revision	4481	Integer	Read	

### 3.5.3 Sub-menu "Modbus data map"

Navigation: Expert → Communication → Modbus data map				
Parameter	Register	Data type	Access	Selection/Default
Scan list register 0	5001	Integer	Read/write	0...65535
Scan list register 1	5002	Integer	Read/write	0...65535
Scan list register 2	5003	Integer	Read/write	0...65535
Scan list register 3	5004	Integer	Read/write	0...65535
Scan list register 4	5005	Integer	Read/write	0...65535
Scan list register 5	5006	Integer	Read/write	0...65535
Scan list register 6	5007	Integer	Read/write	0...65535
Scan list register 7	5008	Integer	Read/write	0...65535
Scan list register 8	5009	Integer	Read/write	0...65535
Scan list register 9	5010	Integer	Read/write	0...65535
Scan list register 10	5011	Integer	Read/write	0...65535
Scan list register 11	5012	Integer	Read/write	0...65535
Scan list register 12	5013	Integer	Read/write	0...65535
Scan list register 13	5014	Integer	Read/write	0...65535
Scan list register 14	5015	Integer	Read/write	0...65535
Scan list register 15	5016	Integer	Read/write	0...65535

### 3.6 Sub-menu "Application"

Navigation: Expert → Application				
Parameter	Register	Data type	Access	Selection/Default
Reset all totalizers	2609	Integer	Read/write	<b>0 = Cancel (Default)</b> 1 = Reset + totalize
Reset overall batching quantity	2913	Integer	Read/write	<b>0 = Cancel (Default)</b> 3 = Reset

#### 3.6.1 Sub-menu "Totalizer 1"

Navigation: Expert → Application → Totalizer 1				
Parameter	Register	Data type	Access	Selection/Default
Assign process variable	2601	Integer	Read/write	0 = Off <b>1 = Mass flow (Default)</b> 2 = Volume flow
Mass unit	2602	Integer	Read/write	2 = t 5 = STon 6 = User mass 12 = g <b>13 = kg (Default) *</b> 14 = oz 15 = lb
Volume unit	2603	Integer	Read/write	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> <b>2 = m<sup>3</sup> (Default) *</b> 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) 21 = User vol. 22 = kgal (us)
Totalizer operation mode	2605	Integer	Read/write	<b>0 = Net flow total (Default)</b> 1 = Forward flow total 2 = Reverse flow total
Control Totalizer 1	2608	Integer	Read/write	<b>0 = Totalize (Default)</b> 1 = Reset + totalize 2 = Preset + hold 3 = Reset + hold 4 = Preset + totalize
Preset value 1	2590	Float	Read/write	
Failure mode	2606	Integer	Read/write	<b>0 = Stop (Default)</b> 1 = Actual value 2 = Last valid value

### 3.6.2 Sub-menu "Totalizer 2"

Navigation: Expert → Application → Totalizer 2				
Parameter	Register	Data type	Access	Selection/Default
Assign process variable	2801	Integer	Read/write	0 = Off <b>1 = Mass flow (Default)</b> 2 = Volume flow
Mass unit	2802	Integer	Read/write	2 = t 5 = STon 6 = User mass 12 = g <b>13 = kg (Default)*</b> 14 = oz 15 = lb
Volume unit	2803	Integer	Read/write	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> <b>2 = m<sup>3</sup> (Default)*</b> 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) 21 = User vol. 22 = kgal (us)
Totalizer operation mode	2805	Integer	Read/write	<b>0 = Net flow total (Default)</b> 1 = Forward flow total 2 = Reverse flow total
Control Totalizer 2	2808	Integer	Read/write	<b>0 = Totalize (Default)</b> 1 = Reset + totalize 2 = Preset + hold 3 = Reset + hold 4 = Preset + totalize
Preset value 2	2592	Float	Read/write	
Failure mode	2806	Integer	Read/write	<b>0 = Stop (Default)</b> 1 = Actual value 2 = Last valid value

### 3.6.3 Sub-menu "Totalizer 3"

Navigation: Expert → Application → Totalizer 3				
Parameter	Register	Data type	Access	Selection/Default
Assign process variable	3001	Integer	Read/write	0 = Off <b>1 = Mass flow (Default)</b> 2 = Volume flow

Navigation: Expert → Application → Totalizer 3				
Parameter	Register	Data type	Access	Selection/Default
Mass unit	3002	Integer	Read/write	2 = t 5 = STon 6 = User mass 12 = g <b>13 = kg (Default)*</b> 14 = oz 15 = lb
Volume unit	3003	Integer	Read/write	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> <b>2 = m<sup>3</sup> (Default)*</b> 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) 21 = User vol. 22 = kgal (us)
Totalizer operation mode	3005	Integer	Read/write	<b>0 = Net flow total (Default)</b> 1 = Forward flow total 2 = Reverse flow total
Control Totalizer 3	3008	Integer	Read/write	<b>0 = Totalize (Default)</b> 1 = Reset + totalize 2 = Preset + hold 3 = Reset + hold 4 = Preset + totalize
Preset value 3	2594	Float	Read/write	
Failure mode	3006	Integer	Read/write	<b>0 = Stop (Default)</b> 1 = Actual value 2 = Last valid value

### 3.6.4 Sub-menu "Batching"

#### Sub-menu "Operation"

Navigation: Expert → Application → Batching → Operation				
Parameter	Register	Data type	Access	Selection/Default
Batch control	2829	Integer	Read/write	<b>0 = Stop (Default)</b> 6 = Start
Batch counter	3520	Integer	Read	
Quantity last batch	2844	Float	Read	
Quantity last drip	3238	Float	Read	
Time last batch	2992	Float	Read	
Close time last batch	2994	Float	Read	
Current drip correction quantity	3240	Float	Read	



Navigation: Expert → Application → Batching → Operation				
Parameter	Register	Data type	Access	Selection/Default
Overall batching quantity	3262	Float	Read	
Overflow number overall batch. quantity	3552	Float	Read	
Batch unit	21295	Integer	Read	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> 3 = ml <b>4 = l (Default)</b> 6 = User mass 9 = ft <sup>3</sup> 10 = fl oz (us) 11 = gal (us) 12 = g 13 = kg 14 = oz 15 = lb 21 = User vol.
Switch output function 1	2488	Integer	Read/write	0 = Batching <b>1 = Open (Default)</b> 2 = Close
Switch status 1	3518	Integer	Read	<b>1 = Open (Default)</b> 2 = Closed
Switch output function 2	2489	Integer	Read/write	0 = Batching <b>1 = Open (Default)</b> 2 = Close
Switch status 2	3519	Integer	Read	<b>1 = Open (Default)</b> 2 = Closed

### Sub-menu "Configuration"

Navigation: Expert → Application → Batching → Configuration				
Parameter	Register	Data type	Access	Selection/Default
Batch profile	3000	Integer	Read/write	<b>0 = Profile 1 (Default)</b> 1 = Profile 2 2 = Profile 3 3 = Profile 4 4 = Profile 5 5 = Profile 6

### Sub-menu "Settings batch profile 1"

Navigation: Expert → Application → Batching → Configuration → Settings batch profile 1				
Parameter	Register	Data type	Access	Selection/Default
Input selector	3580	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Mass flow 2 = Volume flow

Navigation: Expert → Application → Batching → Configuration → Settings batch profile 1				
Parameter	Register	Data type	Access	Selection/Default
Batch unit	3530	Integer	Read/write	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> 3 = ml <b>4 = l (Default)</b> 6 = User mass 9 = ft <sup>3</sup> 10 = fl oz (us) 11 = gal (us) 12 = g 13 = kg 14 = oz 15 = lb 21 = User vol.
Batch quantity	3586	Float	Read/write	
Measuring time drip quantity	3646	Float	Read/write	
Fixed compensation quantity	3634	Float	Read/write	
Drip correction mode	3880	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Fixed time 2 = Fixed time or low flow cut off
Filter depth drip median	3598	Integer	Read/write	0 = Off 1 = Median 3 <b>2 = Median 5 (Default)</b> 3 = Median 7
Average drip correction quantity	3658	Integer	Read/write	
Batch levels	3664	Integer	Read/write	<b>0 = One-level (Default)</b> 1 = Two-level 2 = One-level and blow out
Start level 2	3820	Float	Read/write	
Stop level 2	3832	Float	Read/write	
Blow out delay	3886	Float	Read/write	
Blow out duration	3922	Float	Read/write	
Maximum batch time	3850	Float	Read/write	
Maximum flow rate exceeded	3862	Float	Read/write	
Disable time pressure shock suppression	3934	Float	Read/write	

*Sub-menu "Settings batch profile 2"*

Navigation: Expert → Application → Batching → Configuration → Settings batch profile 2				
Parameter	Register	Data type	Access	Selection/Default
Input selector	3581	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Mass flow 2 = Volume flow

Navigation: Expert → Application → Batching → Configuration → Settings batch profile 2				
Parameter	Register	Data type	Access	Selection/Default
Batch unit	3531	Integer	Read/write	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> 3 = ml <b>4 = l (Default)</b> 6 = User mass 9 = ft <sup>3</sup> 10 = fl oz (us) 11 = gal (us) 12 = g 13 = kg 14 = oz 15 = lb 21 = User vol.
Batch quantity	3588	Float	Read/write	
Measuring time drip quantity	3648	Float	Read/write	
Fixed compensation quantity	3636	Float	Read/write	
Drip correction mode	3881	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Fixed time 2 = Fixed time or low flow cut off
Filter depth drip median	3599	Integer	Read/write	0 = Off 1 = Median 3 <b>2 = Median 5 (Default)</b> 3 = Median 7
Average drip correction quantity	3659	Integer	Read/write	
Batch levels	3665	Integer	Read/write	<b>0 = One-level (Default)</b> 1 = Two-level 2 = One-level and blow out
Start level 2	3822	Float	Read/write	
Stop level 2	3834	Float	Read/write	
Blow out delay	3888	Float	Read/write	
Blow out duration	3924	Float	Read/write	
Maximum batch time	3852	Float	Read/write	
Maximum flow rate exceeded	3864	Float	Read/write	
Disable time pressure shock suppression	3936	Float	Read/write	

*Sub-menu "Settings batch profile 3"*

Navigation: Expert → Application → Batching → Configuration → Settings batch profile 3				
Parameter	Register	Data type	Access	Selection/Default
Input selector	3582	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Mass flow 2 = Volume flow

Navigation: Expert → Application → Batching → Configuration → Settings batch profile 3				
Parameter	Register	Data type	Access	Selection/Default
Batch unit	3532	Integer	Read/write	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> 3 = ml <b>4 = l (Default)</b> 6 = User mass 9 = ft <sup>3</sup> 10 = fl oz (us) 11 = gal (us) 12 = g 13 = kg 14 = oz 15 = lb 21 = User vol.
Batch quantity	3590	Float	Read/write	
Measuring time drip quantity	3650	Float	Read/write	
Fixed compensation quantity	3638	Float	Read/write	
Drip correction mode	3882	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Fixed time 2 = Fixed time or low flow cut off
Filter depth drip median	3600	Integer	Read/write	0 = Off 1 = Median 3 <b>2 = Median 5 (Default)</b> 3 = Median 7
Average drip correction quantity	3660	Integer	Read/write	
Batch levels	3666	Integer	Read/write	<b>0 = One-level (Default)</b> 1 = Two-level 2 = One-level and blow out
Start level 2	3824	Float	Read/write	
Stop level 2	3836	Float	Read/write	
Blow out delay	3890	Float	Read/write	
Blow out duration	3926	Float	Read/write	
Maximum batch time	3854	Float	Read/write	
Maximum flow rate exceeded	3866	Float	Read/write	
Disable time pressure shock suppression	3938	Float	Read/write	

*Sub-menu "Settings batch profile 4"*

Navigation: Expert → Application → Batching → Configuration → Settings batch profile 4				
Parameter	Register	Data type	Access	Selection/Default
Input selector	3583	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Mass flow 2 = Volume flow

Navigation: Expert → Application → Batching → Configuration → Settings batch profile 4				
Parameter	Register	Data type	Access	Selection/Default
Batch unit	3533	Integer	Read/write	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> 3 = ml <b>4 = l (Default)</b> 6 = User mass 9 = ft <sup>3</sup> 10 = fl oz (us) 11 = gal (us) 12 = g 13 = kg 14 = oz 15 = lb 21 = User vol.
Batch quantity	3592	Float	Read/write	
Measuring time drip quantity	3652	Float	Read/write	
Fixed compensation quantity	3640	Float	Read/write	
Drip correction mode	3883	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Fixed time 2 = Fixed time or low flow cut off
Filter depth drip median	3601	Integer	Read/write	0 = Off 1 = Median 3 <b>2 = Median 5 (Default)</b> 3 = Median 7
Average drip correction quantity	3661	Integer	Read/write	
Batch levels	3667	Integer	Read/write	<b>0 = One-level (Default)</b> 1 = Two-level 2 = One-level and blow out
Start level 2	3826	Float	Read/write	
Stop level 2	3838	Float	Read/write	
Blow out delay	3892	Float	Read/write	
Blow out duration	3928	Float	Read/write	
Maximum batch time	3856	Float	Read/write	
Maximum flow rate exceeded	3868	Float	Read/write	
Disable time pressure shock suppression	3940	Float	Read/write	

*Sub-menu "Settings batch profile 5"*

Navigation: Expert → Application → Batching → Configuration → Settings batch profile 5				
Parameter	Register	Data type	Access	Selection/Default
Input selector	3584	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Mass flow 2 = Volume flow

Navigation: Expert → Application → Batching → Configuration → Settings batch profile 5				
Parameter	Register	Data type	Access	Selection/Default
Batch unit	3534	Integer	Read/write	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> 3 = ml <b>4 = l (Default)</b> 6 = User mass 9 = ft <sup>3</sup> 10 = fl oz (us) 11 = gal (us) 12 = g 13 = kg 14 = oz 15 = lb 21 = User vol.
Batch quantity	3594	Float	Read/write	
Measuring time drip quantity	3654	Float	Read/write	
Fixed compensation quantity	3642	Float	Read/write	
Drip correction mode	3884	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Fixed time 2 = Fixed time or low flow cut off
Filter depth drip median	3602	Integer	Read/write	0 = Off 1 = Median 3 <b>2 = Median 5 (Default)</b> 3 = Median 7
Average drip correction quantity	3662	Integer	Read/write	
Batch levels	3668	Integer	Read/write	<b>0 = One-level (Default)</b> 1 = Two-level 2 = One-level and blow out
Start level 2	3828	Float	Read/write	
Stop level 2	3840	Float	Read/write	
Blow out delay	3894	Float	Read/write	
Blow out duration	3930	Float	Read/write	
Maximum batch time	3858	Float	Read/write	
Maximum flow rate exceeded	3870	Float	Read/write	
Disable time pressure shock suppression	3942	Float	Read/write	

*Sub-menu "Settings batch profile 6"*

Navigation: Expert → Application → Batching → Configuration → Settings batch profile 6				
Parameter	Register	Data type	Access	Selection/Default
Input selector	3585	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Mass flow 2 = Volume flow

Navigation: Expert → Application → Batching → Configuration → Settings batch profile 6				
Parameter	Register	Data type	Access	Selection/Default
Batch unit	3535	Integer	Read/write	0 = cm <sup>3</sup> 1 = dm <sup>3</sup> 3 = ml <b>4 = l (Default)</b> 6 = User mass 9 = ft <sup>3</sup> 10 = fl oz (us) 11 = gal (us) 12 = g 13 = kg 14 = oz 15 = lb 21 = User vol.
Batch quantity	3596	Float	Read/write	
Measuring time drip quantity	3656	Float	Read/write	
Fixed compensation quantity	3644	Float	Read/write	
Drip correction mode	3885	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Fixed time 2 = Fixed time or low flow cut off
Filter depth drip median	3603	Integer	Read/write	0 = Off 1 = Median 3 <b>2 = Median 5 (Default)</b> 3 = Median 7
Average drip correction quantity	3663	Integer	Read/write	
Batch levels	3669	Integer	Read/write	<b>0 = One-level (Default)</b> 1 = Two-level 2 = One-level and blow out
Start level 2	3830	Float	Read/write	
Stop level 2	3842	Float	Read/write	
Blow out delay	3896	Float	Read/write	
Blow out duration	3932	Float	Read/write	
Maximum batch time	3860	Float	Read/write	
Maximum flow rate exceeded	3872	Float	Read/write	
Disable time pressure shock suppression	3944	Float	Read/write	

### 3.7 Sub-menu "Diagnostics"

Navigation: Expert → Diagnostics				
Parameter	Register	Data type	Access	Selection/Default
Actual diagnostics	2732	Integer	Read	
Timestamp	2719	String	Read	
Actual diagnostics	20190	Integer	Read	
Previous diagnostics	2734	Integer	Read	
Timestamp	2068	String	Read	
Previous diagnostics	20184	Integer	Read	
Operating time from restart	2624	String	Read	
Operating time	2631	String	Read	

### 3.7.1 Sub-menu "Diagnostic list"

Navigation: Expert → Diagnostics → Diagnostic list				
Parameter	Register	Data type	Access	Selection/Default
Diagnostics 1	2736	Integer	Read	
Diagnostics 1	20189	Integer	Read	
Timestamp	2710	String	Read	
Diagnostics 2	2738	Integer	Read	
Diagnostics 2	20188	Integer	Read	
Timestamp	2701	String	Read	
Diagnostics 3	2740	Integer	Read	
Diagnostics 3	20187	Integer	Read	
Timestamp	2692	String	Read	
Diagnostics 4	2742	Integer	Read	
Diagnostics 4	20186	Integer	Read	
Timestamp	2683	String	Read	
Diagnostics 5	2744	Integer	Read	
Diagnostics 5	20185	Integer	Read	
Timestamp	2675	String	Read	

### 3.7.2 Sub-menu "Event logbook"

Navigation: Expert → Diagnostics → Event logbook				
Parameter	Register	Data type	Access	Selection/Default
Filter options	2639	Integer	Read/write	0 = Failure (F) 4 = Maintenance required (M) 8 = Function check (C) 12 = Out of specification (S) 16 = Information (I) 255 = All (Default)

### 3.7.3 Sub-menu "Device information"

Navigation: Expert → Diagnostics → Device information				
Parameter	Register	Data type	Access	Selection/Default
Device tag	2026	String	Read/write	
Serial number	7003	String	Read	
Firmware version	7277	String	Read	
Device name	7263	String	Read	
Order code	2058	String	Read	
Extended order code 1	2212	String	Read	
Extended order code 2	2222	String	Read	
Extended order code 3	2232	String	Read	
ENP version	4003	String	Read	
Configuration counter	3101	Integer	Read	



### 3.7.4 Sub-menu "Min/max values"

#### Sub-menu "Medium temperature"

Navigation: Expert → Diagnostics → Min/max values → Medium temperature				
Parameter	Register	Data type	Access	Selection/Default
Minimum value	7529	Float	Read	Floating-point number with sign
Maximum value	7531	Float	Read	Floating-point number with sign

### 3.7.5 Sub-menu "Simulation"

Navigation: Expert → Diagnostics → Simulation				
Parameter	Register	Data type	Access	Selection/Default
Assign simulation process variable	6813	Integer	Read/write	<b>0 = Off (Default)</b> 1 = Mass flow 2 = Volume flow 4 = Density 7 = Temperature
Value process variable	6814	Float	Read/write	
Simulation device alarm	6812	Integer	Read/write	<b>0 = Off (Default)</b> 1 = On

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