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Valid as of version
01.00.zz (Device firmware)

Special documentation
Proline Promag 100
Register information Modbus RS485

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1 Document information

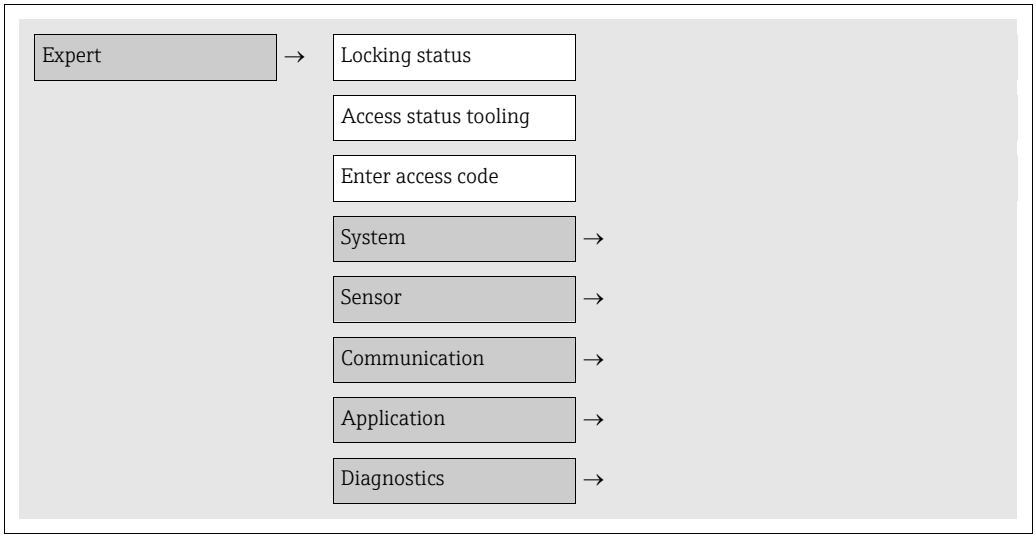
1.1 Document function

This document is part of the Operating Instructions for Proline Promass 100 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	▪ Float Length = 4 bytes ▪ Integer Length = 2 bytes ▪ String Length depends on function	Possible ways of accessing the function: ▪ Read Read access via function code 03, 04 or 23 ▪ Write Write access via function code 06, 16 or 23	Options List of the individual options for the parameter ▪ Option 1 ▪ Option 2 (Default) ▪ Option 3 (Default)* Note! – Default setting emphasized and marked with "Default" – * = Default setting depends on country and device properties 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!

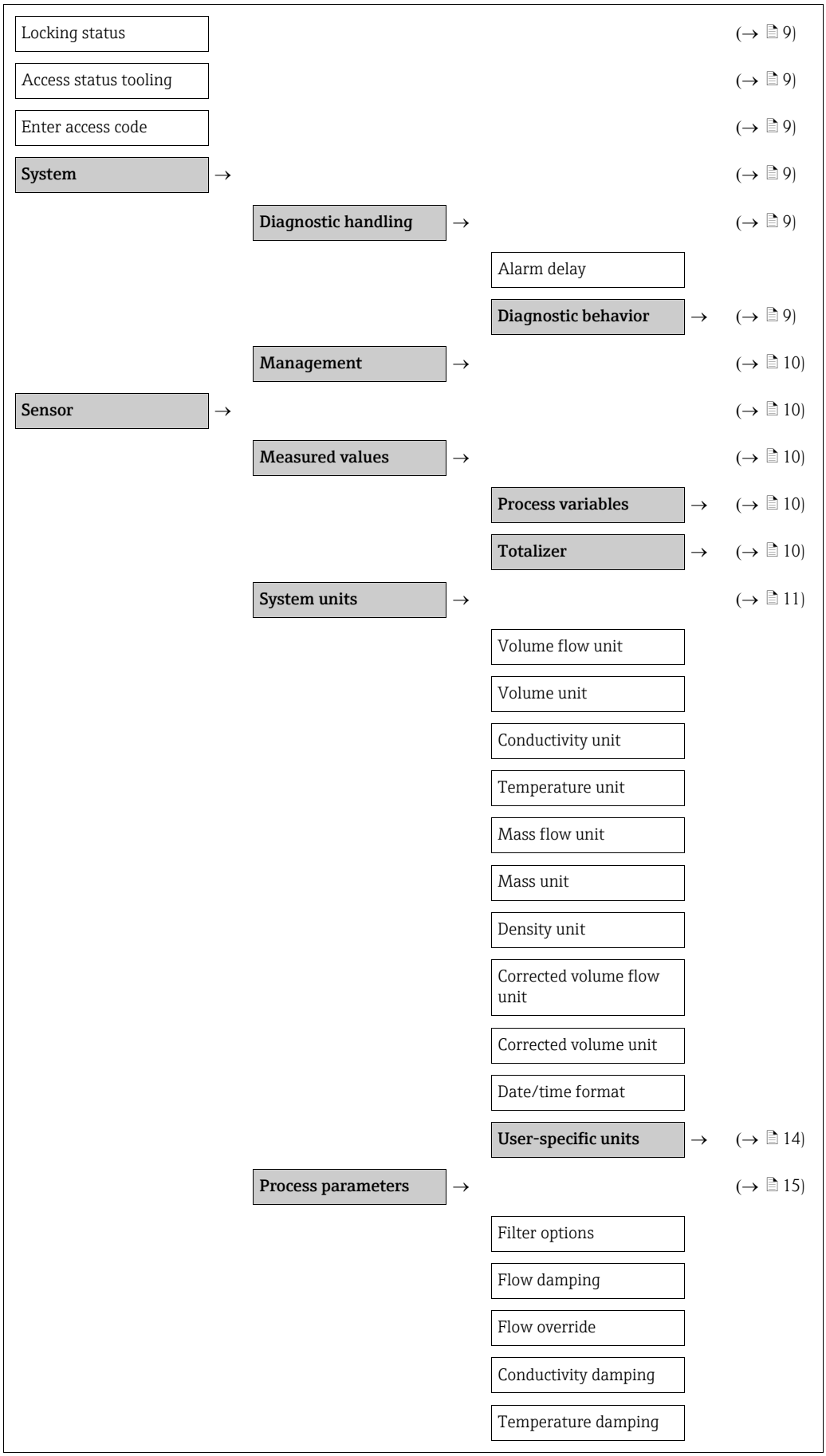
1.2.3 Modbus RS485 register address model

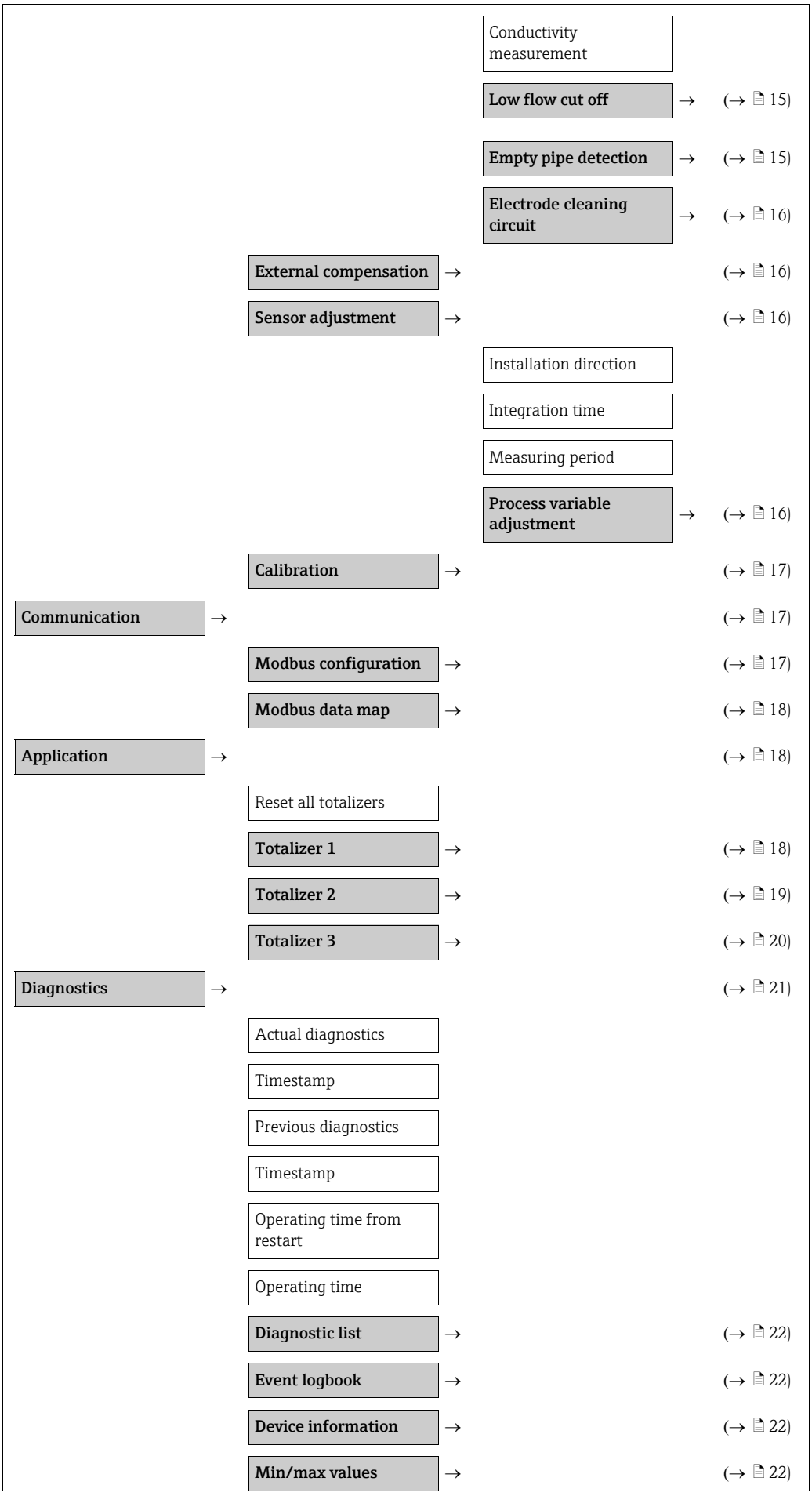
The Modbus RS485 register addresses of the measuring device are implemented in accordance with "Modbus Applications Protocol Specification V1.1".

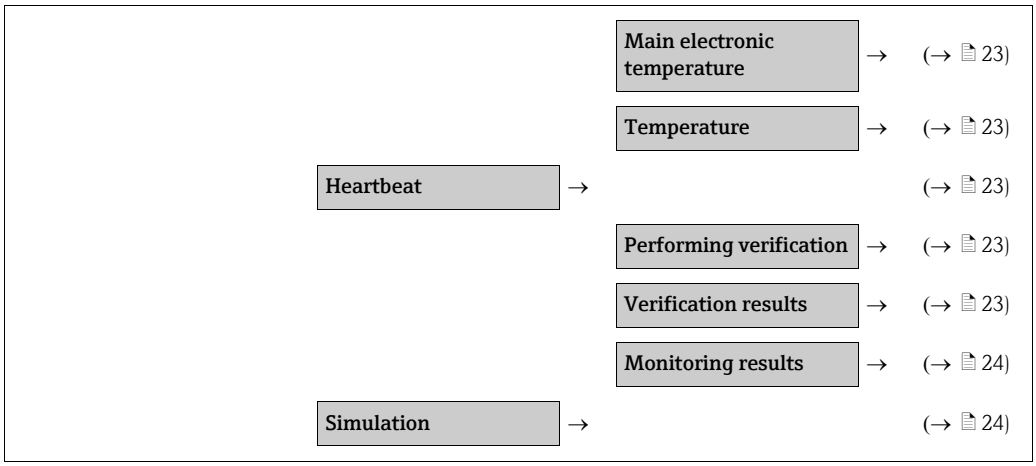
In addition, also systems are deployed which work with the register address model "Modicon Modbus Protocol Reference Guide (PI-MBUS-300 Rev. J)". Depending on the used function code, the register address is extended with a prefix number in this specification:
▪ "3" → Access type "Read"
▪ "4" → Access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




Conductivity measurement
Low flow cut off → (→ 15)
Empty pipe detection → (→ 15)
Electrode cleaning circuit → (→ 16)
External compensation → (→ 16)
Sensor adjustment → (→ 16)
Installation direction
Integration time
Measuring period
Process variable adjustment → (→ 16)
Calibration → (→ 17)
Communication → (→ 17)
Modbus configuration → (→ 17)
Modbus data map → (→ 18)
Application → (→ 18)
Reset all totalizers
Totalizer 1 → (→ 18)
Totalizer 2 → (→ 19)
Totalizer 3 → (→ 20)
Diagnostics → (→ 21)
Actual diagnostics
Timestamp
Previous diagnostics
Timestamp
Operating time from restart
Operating time
Diagnostic list → (→ 22)
Event logbook → (→ 22)
Device information → (→ 22)
Min/max values → (→ 22)


Main electronic temperature → (→ 23)
Temperature → (→ 23)
Heartbeat → (→ 23)
Performing verification → (→ 23)
Verification results → (→ 23)
Monitoring results → (→ 24)
Simulation → (→ 24)

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 **1 = Maintenance (Default)** 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. 531	2397	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 832	2759	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 833	2762	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 834	2761	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 835	2760	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 862	2097	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 937	2396	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm

3.1.2 Sub-menu "Management"

Navigation: Expert → System → Management				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Device reset	6817	Integer	Read/write	**0 = Cancel (Default)** 1 = Restart device 2 = To delivery settings
Activate SW option	2795	Integer	Read/write	Positive Ganzzahl
Software option overview	2902	Integer	Read	1 = Extended HistoROM 16384 = Heartbeat Monitoring 32768 = Heartbeat Verification 32 = Electrode cleaning circuit
Permanent storage	6907	Integer	Read/write	0 = Off **1 = On (Default)**
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**
Volume flow	2007	Float	Read	
Mass flow	2009	Float	Read	
Conductivity	2013	Float	Read	
Corrected volume flow	2011	Float	Read	
Temperature	2015	Float	Read	
Corrected conductivity	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

3.2.2 Sub-menu "System units"

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

Navigation: Expert → Sensor → System units				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
				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) 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)
Volume unit	2104	Integer	Read/write	0 = cm^3 1 = dm^3 **2 = m^3 (Default)*** 3 = ml 4 = l 5 = hl 6 = Ml Mega 8 = af 9 = ft^3 10 = fl oz (us) 11 = gal (us) 12 = Mgal (us) 13 = bbl (us;liq.) 14 = bbl (us;beer) 15 = bbl (us;oil) 16 = bbl (us;tank) 17 = gal (imp) 18 = Mgal (imp) 20 = bbl (imp;oil) 21 = User vol. 22 = kgal
Conductivity unit	2121	Integer	Read/write	1 = MS/m 2 = kS/m 3 = S/m 4 = S/cm 5 = mS/m 6 = mS/cm 7 = µS/m **8 = µS/cm (Default)*** 9 = µS/mm 10 = nS/cm
Temperature unit	2109	Integer	Read/write	**0 = °C (Default)*** 1 = K 2 = °F 3 = °R

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 **6 = kg/h (Default)*** 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	0 = g **1 = kg (Default)*** 2 = t 3 = oz 4 = lb 5 = STon 6 = User mass
Density unit	2107	Integer	Read/write	0 = g/cm³ 2 = kg/dm³ **3 = kg/l (Default)*** 4 = kg/m³ 5 = SD4°C 6 = SD15°C 7 = SD20°C 8 = SG4°C 9 = SG15°C 10 = SG20°C 11 = lb/ft³ 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) 19 = lb/bbl (imp;oil) 21 = g/m³

Navigation: Expert → Sensor → System units				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Corrected volume flow unit	2105	Integer	Read/write	0 = Nl/s 1 = Nl/min **2 = Nl/h (Default)*** 3 = Nl/d 4 = Nm^3/s 5 = Nm^3/min 6 = Nm^3/h 7 = Nm^3/d 8 = Sm^3/s 9 = Sm^3/min 10 = Sm^3/h 11 = Sm^3/d 12 = Sft^3/s 13 = Sft^3/min 14 = Sft^3/h 15 = Sft^3/d 16 = Sgal/s (us) 17 = Sgal/min (us) 18 = Sgal/h (us) 19 = Sgal/d (us) 20 = Sbbl/s (us;liq.) 21 = Sbbl/min (us;liq.) 22 = Sbbl/h (us;liq.) 23 = Sbbl/d (us;liq.) 24 = Sgal/s (imp) 25 = Sgal/min (imp) 26 = Sgal/h (imp) 27 = Sgal/d (imp) 28 = User vol./s 29 = User vol/min 30 = User vol/h 31 = User vol/d
Corrected volume unit	2106	Integer	Read/write	0 = Nl **1 = Nm^3 (Default)*** 2 = Sm^3 3 = Sft^3 5 = Sgal (us) 6 = Sbbl (us;liq.) 7 = Sgal (imp) 8 = UserCrVol.
Date/time format	2150	Integer	Read/write	**0 = dd.mm.yy hh:mm (Default)** 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 volume text	2542	String	Read/write	
User volume factor	2119	Float	Read/write	Gleitkommazahl mit Vorzeichen
User mass text	2531	String	Read/write	
User mass factor	2115	Float	Read/write	Gleitkommazahl mit Vorzeichen
User corrected volume text	2568	String	Read/write	
User corrected volume factor	2573	Float	Read/write	Gleitkommazahl mit Vorzeichen

3.2.3 Sub-menu "Process parameters"

Navigation: Expert → Sensor → Process parameters				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Filter options	2273	Integer	Read/write	**1 = Standard CIP off (Default)** 2 = Standard CIP on 3 = Dynamic CIP off 4 = Dynamic CIP on
Flow damping	2274	Integer	Read/write	0…15
Flow override	5503	Integer	Read/write	**0 = Off (Default)** 1 = On
Conductivity damping	5508	Float	Read/write	0…999.9
Temperature damping	2483	Float	Read/write	0…999.9
Conductivity measurement	2268	Integer	Read/write	**0 = Off (Default)** 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 **1 = Volume flow (Default)** 2 = Mass flow 3 = Corrected 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 "Empty pipe detection"

Navigation: Expert → Sensor → Process parameters → Empty pipe detection				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Empty pipe detection	5106	Integer	Read/write	**0 = Off (Default)** 1 = On
Switch point empty pipe detection	2890	Float	Read/write	0…100
Response time empty pipe detection	5108	Float	Read/write	0…100
New adjustment	2335	Integer	Read/write	**0 = Cancel (Default)** 1 = Empty pipe adjust 2 = Full pipe adjust
Progress	2336	Integer	Read	**0 = Not ok (Default)** 6 = Ok 8 = Busy
Empty pipe adjust value	2181	Float	Read	Positive Gleitkommazahl
Full pipe adjust value	2832	Float	Read	Positive Gleitkommazahl
Measured value EPD	2298	Float	Read	

Sub-menu "Electrode cleaning circuit"

Navigation: Expert → Sensor → Process parameters → Electrode cleaning circuit				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Electrode cleaning circuit	2280	Integer	Read/write	**0 = Off (Default)** 1 = On
ECC duration	2330	Float	Read/write	0.01...30
ECC recovery time	2332	Float	Read/write	1...600
ECC cleaning cycle	2328	Float	Read/write	0.5...168
ECC Polarity	2334	Integer	Read	**0 = Positive (Default)** 1 = Negative

3.2.4 Sub-menu "External compensation"

Navigation: Expert → Sensor → External compensation				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Temperature source	2114	Integer	Read/write	0 = Internal temperature sensor **1 = External value (Default)**
External temperature	2125	Float	Read/write	-100273.1499...99726.8499
Density source	2497	Integer	Read/write	**0 = Fixed density (Default)** 1 = External density
External density	2117	Float	Read/write	Positive Gleitkommazahl
Fixed density	2830	Float	Read/write	Positive Gleitkommazahl
Reference density	2536	Float	Read/write	Gleitkommazahl mit Vorzeichen

3.2.5 Sub-menu "Sensor adjustment"

Navigation: Expert → Sensor → Sensor adjustment				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Installation direction	5501	Integer	Read/write	**0 = Flow in arrow direction (Default)** 1 = Flow against arrow direction
Integration time	2260	Float	Read	1...65
Measuring period	2852	Float	Read	50...1000

Sub-menu "Process variable adjustment"

Navigation: Expert → Sensor → Sensor adjustment → Process variable adjustment				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Volume flow offset	5521	Float	Read/write	Gleitkommazahl mit Vorzeichen
Volume flow factor	5519	Float	Read/write	Positive Gleitkommazahl
Mass flow offset	5525	Float	Read/write	Gleitkommazahl mit Vorzeichen
Mass flow factor	5523	Float	Read/write	Positive Gleitkommazahl
Conductivity offset	5529	Float	Read/write	Gleitkommazahl mit Vorzeichen
Conductivity factor	5527	Float	Read/write	Positive Gleitkommazahl
Corrected volume flow offset	2044	Float	Read/write	Gleitkommazahl mit Vorzeichen
Corrected volume flow factor	2076	Float	Read/write	Positive Gleitkommazahl

Navigation: Expert → Sensor → Sensor adjustment → Process variable adjustment				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Temperature offset	2046	Float	Read/write	Gleitkommazahl mit Vorzeichen
Temperature factor	2042	Float	Read/write	Positive Gleitkommazahl

3.2.6 Sub-menu "Calibration"

Navigation: Expert → Sensor → Calibration				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Nominal diameter	2048	String	Read	
Calibration factor	2313	Float	Read	Gleitkommazahl mit Vorzeichen
Zero point	2870	Float	Read	Gleitkommazahl mit Vorzeichen
Conductivity Calibration factor	19806	Float	Read/write	0...10000

3.3 Sub-menu "Communication"

3.3.1 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 **4 = 19200 BAUD (Default)** 5 = 38400 BAUD 6 = 57600 BAUD 7 = 115200 BAUD
Data transfer mode	4913	Integer	Read/write	**0 = RTU (Default)** 1 = ASCII
Parity	4914	Integer	Read/write	**0 = Even (Default)** 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 **3 = 1-0-3-2 (Default)**
Telegram delay	4916	Float	Read/write	0...100
Assign diagnostic behavior	4921	Integer	Read/write	0 = Off 1 = Warning **2 = Alarm (Default)** 3 = Alarm or warning
Failure mode	4920	Integer	Read/write	**0 = NaN value (Default)** 1 = Last valid value
Interpreter mode	4925	Integer	Read/write	**0 = Standard (Default)** 1 = Ignore surplus bytes

3.3.2 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

3.4 Sub-menu "Application"

Navigation: Expert → Application				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Reset all totalizers	2609	Integer	Read/write	**0 = Cancel (Default)** 1 = Reset + totalize

3.4.1 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 1 = Volume flow **2 = Mass flow (Default)** 3 = Corrected volume flow
Mass unit	2602	Integer	Read/write	0 = g **1 = kg (Default)*** 2 = t 3 = oz 4 = lb 5 = STon 6 = User mass

Navigation: Expert → Application → Totalizer 1				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Volume unit	2603	Integer	Read/write	0 = cm^3 1 = dm^3 **2 = m^3 (Default)*** 3 = ml 4 = l 5 = hl 6 = Ml Mega 8 = af 9 = ft^3 10 = fl oz (us) 11 = gal (us) 12 = Mgal (us) 13 = bbl (us;liq.) 14 = bbl (us;beer) 15 = bbl (us;oil) 16 = bbl (us;tank) 17 = gal (imp) 18 = Mgal (imp) 20 = bbl (imp;oil) 21 = User vol. 22 = kgal
Corrected volume unit	2604	Integer	Read/write	0 = Nl **1 = Nm^3 (Default)*** 2 = Sm^3 3 = Sft^3 5 = Sgal (us) 6 = Sbbl (us;liq.) 7 = Sgal (imp) 8 = UserCrVol.
Totalizer operation mode	2605	Integer	Read/write	**0 = Net flow total (Default)** 1 = Forward flow total 2 = Reverse flow total
Control Totalizer 1	2608	Integer	Read/write	**0 = Totalize (Default)** 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	**0 = Stop (Default)** 1 = Actual value 2 = Last valid value

3.4.2 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 1 = Volume flow **2 = Mass flow (Default)** 3 = Corrected volume flow
Mass unit	2802	Integer	Read/write	0 = g **1 = kg (Default)*** 2 = t 3 = oz 4 = lb 5 = STon 6 = User mass

Navigation: Expert → Application → Totalizer 2				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Volume unit	2803	Integer	Read/write	0 = cm^3 1 = dm^3 **2 = m^3 (Default)*** 3 = ml 4 = l 5 = hl 6 = Ml Mega 8 = af 9 = ft^3 10 = fl oz (us) 11 = gal (us) 12 = Mgal (us) 13 = bbl (us;liq.) 14 = bbl (us;beer) 15 = bbl (us;oil) 16 = bbl (us;tank) 17 = gal (imp) 18 = Mgal (imp) 20 = bbl (imp;oil) 21 = User vol. 22 = kgal
Corrected volume unit	2804	Integer	Read/write	0 = Nl **1 = Nm^3 (Default)*** 2 = Sm^3 3 = Sft^3 5 = Sgal (us) 6 = Sbbl (us;liq.) 7 = Sgal (imp) 8 = UserCrVol.
Totalizer operation mode	2805	Integer	Read/write	**0 = Net flow total (Default)** 1 = Forward flow total 2 = Reverse flow total
Control Totalizer 2	2808	Integer	Read/write	**0 = Totalize (Default)** 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	**0 = Stop (Default)** 1 = Actual value 2 = Last valid value

3.4.3 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 1 = Volume flow **2 = Mass flow (Default)** 3 = Corrected volume flow
Mass unit	3002	Integer	Read/write	0 = g **1 = kg (Default)*** 2 = t 3 = oz 4 = lb 5 = STon 6 = User mass

Navigation: Expert → Application → Totalizer 3				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Volume unit	3003	Integer	Read/write	0 = cm^3 1 = dm^3 **2 = m^3 (Default)*** 3 = ml 4 = l 5 = hl 6 = Ml Mega 8 = af 9 = ft^3 10 = fl oz (us) 11 = gal (us) 12 = Mgal (us) 13 = bbl (us;liq.) 14 = bbl (us;beer) 15 = bbl (us;oil) 16 = bbl (us;tank) 17 = gal (imp) 18 = Mgal (imp) 20 = bbl (imp;oil) 21 = User vol. 22 = kgal
Corrected volume unit	3004	Integer	Read/write	0 = Nl **1 = Nm^3 (Default)*** 2 = Sm^3 3 = Sft^3 5 = Sgal (us) 6 = Sbbl (us;liq.) 7 = Sgal (imp) 8 = UserCrVol.
Totalizer operation mode	3005	Integer	Read/write	**0 = Net flow total (Default)** 1 = Forward flow total 2 = Reverse flow total
Control Totalizer 3	3008	Integer	Read/write	**0 = Totalize (Default)** 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	**0 = Stop (Default)** 1 = Actual value 2 = Last valid value

3.5 Sub-menu "Diagnostics"

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

3.5.1 Sub-menu "Diagnostic list"

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

3.5.2 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)**

3.5.3 Sub-menu "Device information"

Navigation: Expert → Diagnostics → Device information				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Device tag	2026	String	Read	
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	

3.5.4 Sub-menu "Min/max values"

Navigation: Expert → Diagnostics → Min/max values				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Reset min/max values	2269	Integer	Read/write	**0 = Cancel (Default)**

Sub-menu "Main electronic temperature"

Navigation: Expert → Diagnostics → Min/max values → Main electronic temperature				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Minimum value	2292	Float	Read	Gleitkommazahl mit Vorzeichen
Maximum value	2294	Float	Read	Gleitkommazahl mit Vorzeichen

Sub-menu "Temperature"

Navigation: Expert → Diagnostics → Min/max values → Temperature				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Minimum value	2339	Float	Read	Gleitkommazahl mit Vorzeichen
Maximum value	2337	Float	Read	Gleitkommazahl mit Vorzeichen

3.5.5 Sub-menu "Heartbeat"

Sub-menu "Performing verification"

Navigation: Expert → Diagnostics → Heartbeat → Performing verification				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Year	2495	Integer	Read/write	9...99
Month	2494	Integer	Read/write	**0 = January (Default)** 1 = February 2 = March 3 = April 4 = May 5 = June 6 = July 7 = August 8 = September 9 = October 10 = November 11 = December
Day	2493	Integer	Read/write	
Hour	2492	Integer	Read/write	
AM/PM	2496	Integer	Read/write	**0 = AM (Default)** 1 = PM
Minute	2467	Integer	Read/write	0...59
Start verification	2270	Integer	Read/write	**0 = Cancel (Default)** 1 = Start
Progress	6797	Integer	Read	
Status	2079	Integer	Read	0 = Failed **1 = Ready (Default)** 3 = Check not done 8 = Busy

Sub-menu "Verification results"

Navigation: Expert → Diagnostics → Heartbeat → Verification results				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Date/time	2372	String	Read	
Verification ID	2315	Integer	Read	

Navigation: Expert → Diagnostics → Heartbeat → Verification results				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Operating time	3346	String	Read	
Overall result	2355	Integer	Read	0 = Failed 1 = Not used 2 = Passed **3 = Check not done (Default)**
Sensor	2384	Integer	Read	0 = Failed 1 = Not used 2 = Passed **3 = Check not done (Default)**
Sensor electronic module	2385	Integer	Read	0 = Failed 1 = Not used 2 = Passed **3 = Check not done (Default)**
I/O module	2386	Integer	Read	0 = Failed 1 = Not used 2 = Passed **3 = Check not done (Default)**

Sub-menu "Monitoring results"

Navigation: Expert → Diagnostics → Heartbeat → Monitoring results				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Noise	2463	Float	Read	
Coil rise time	2465	Float	Read	
Reference electrode potential against PE	3990	Float	Read	

3.5.6 Sub-menu "Simulation"

Navigation: Expert → Diagnostics → Simulation				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Assign simulation process variable	6813	Integer	Read/write	**0 = Off (Default)** 1 = Volume flow 2 = Mass flow 3 = Corrected volume flow 4 = Conductivity 7 = Temperature 9 = Corrected conductivity
Value process variable	6814	Float	Read/write	
Simulation device alarm	6812	Integer	Read/write	**0 = Off (Default)** 1 = On

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