SD01166D/06/EN/01.14
71241770

Valid as of version
01.02.zz (Device firmware)

Special documentation
CNGmass
Register information Modbus RS485

Endress+Hauser
People for Process Automation

Table of contents

1 Document information

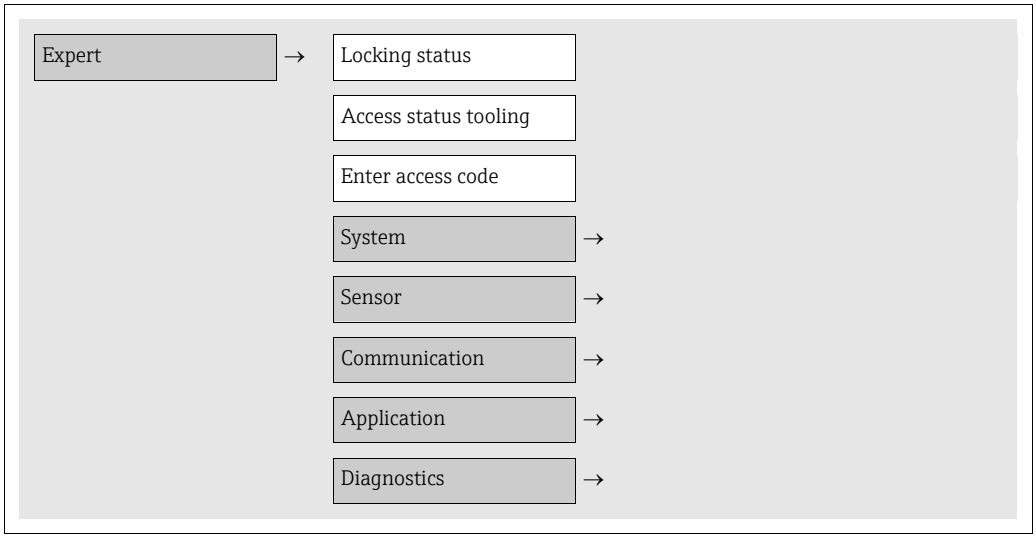
1.1 Document function

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	▪ 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!

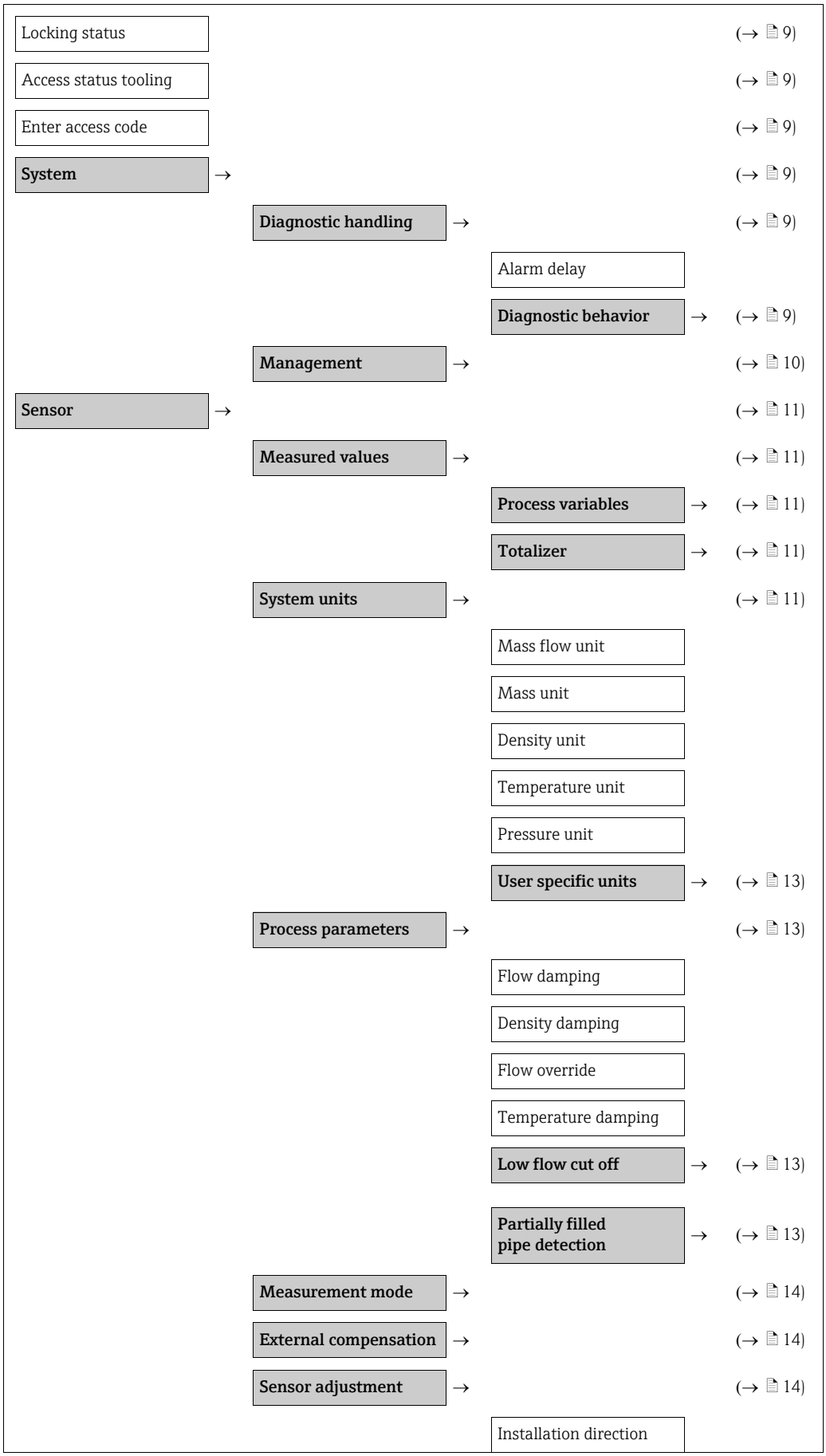
1.2.3 Modbus RS485 register address model

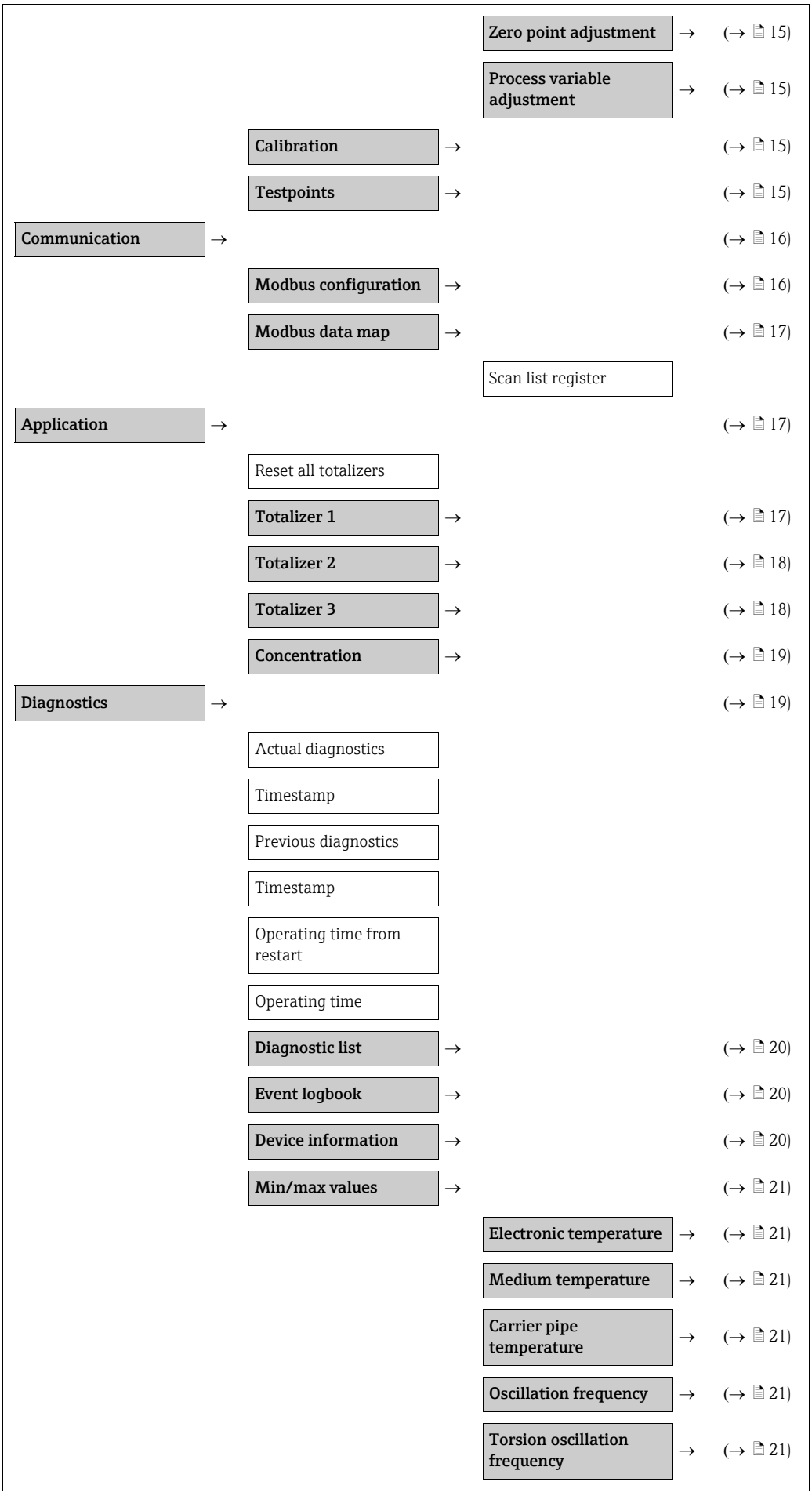
The Modbus RS485 register addresses of the measuring device are implemented in accordance with "Modbus Applications Protocol Specification V1.1".

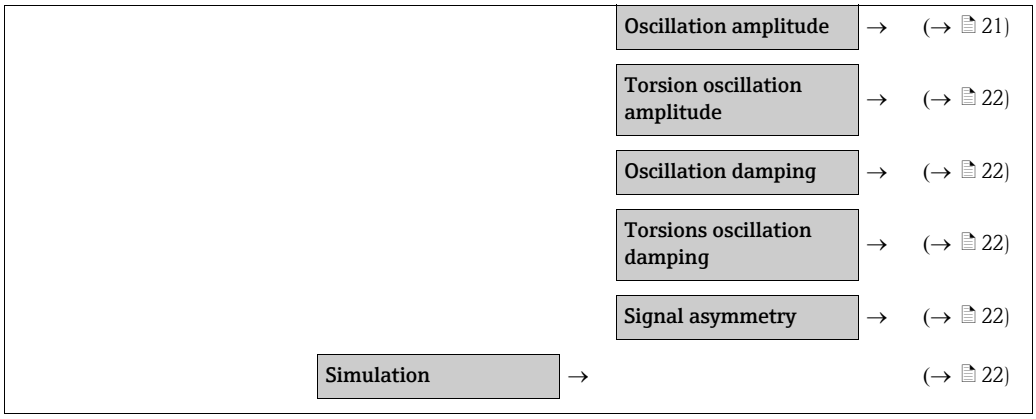
In addition, also systems are deployed which work with the register address model "Modicon Modbus Protocol Reference Guide (PI-MBUS-300 Rev. J)". Depending on the used function code, the register address is extended with a prefix number in this specification:
▪ "3" → Access type "Read"
▪ "4" → Access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




Zero point adjustment → (→ 15)
Process variable adjustment → (→ 15)
Calibration → (→ 15)
Testpoints → (→ 15)
Communication → (→ 16)
Modbus configuration → (→ 16)
Modbus data map → (→ 17)
Scan list register
Application → (→ 17)
Reset all totalizers
Totalizer 1 → (→ 17)
Totalizer 2 → (→ 18)
Totalizer 3 → (→ 18)
Concentration → (→ 19)
Diagnostics → (→ 19)
Actual diagnostics
Timestamp
Previous diagnostics
Timestamp
Operating time from restart
Operating time
Diagnostic list → (→ 20)
Event logbook → (→ 20)
Device information → (→ 20)
Min/max values → (→ 21)
Electronic temperature → (→ 21)
Medium temperature → (→ 21)
Carrier pipe temperature → (→ 21)
Oscillation frequency → (→ 21)
Torsion oscillation frequency → (→ 21)


Oscillation amplitude → (→ 21)
Torsion oscillation amplitude → (→ 22)
Oscillation damping → (→ 22)
Torsions oscillation damping → (→ 22)
Signal asymmetry → (→ 22)
Simulation → (→ 22)

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. 044	2757	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 046	2756	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 144	2081	Integer	Read/write	0 = Off 1 = Logbook entry only 2 = Warning **3 = Alarm (Default)**
Assign behavior of diagnostic no. 192	2022	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 274	2755	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 392	2023	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 592	2024	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm

Navigation: Expert → System → Diagnostic handling → Diagnostic behavior				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
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. 912	2758	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 913	2754	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 944	2082	Integer	Read/write	0 = Off 1 = Logbook entry only **2 = Warning (Default)** 3 = Alarm
Assign behavior of diagnostic no. 992	2021	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 integer
Software option overview	2902	Integer	Read	4 = Concentration
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**
Mass flow	2007	Float	Read	
Density	2013	Float	Read	
Temperature	2017	Float	Read	
Pressure value	2089	Float	Read	
Concentration	2598	Float	Read	
Target mass flow	2797	Float	Read	
Carrier mass flow	2799	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**
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

Navigation: Expert → Sensor → System units				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
	2101	Integer	Read/write	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/cf 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/m³ 22 = g/ml
Temperature unit	2109	Integer	Read/write	**0 = °C (Default)*** 1 = K 2 = °F 3 = °R
Pressure unit	2130	Integer	Read/write	**0 = bar a (Default)*** 1 = psi a 2 = bar g 3 = psi g 4 = Pa a 5 = kPa a 6 = MPa a 7 = Pa g 8 = kPa g 9 = MPa g 10 = User pres.
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 mass text	2531	String	Read/write	
User mass factor	2115	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
User pressure text	2559	String	Read/write	
User pressure offset	2566	Float	Read/write	Floating-point number with sign
User pressure factor	2564	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	**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 = Mass flow (Default)**
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	**0 = Off (Default)** 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 "Measurement mode"

Navigation: Expert → Sensor → Measurement mode				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Select medium	2442	Integer	Read/write	**0 = Liquid (Default)** 1 = Gas
Select gas type	5229	Integer	Read/write	0 = Air 1 = Nitrogen N2 2 = Argon Ar 3 = Helium He 4 = Carbon dioxide CO2 5 = Oxygen O2 **6 = Methane CH4 (Default)** 7 = Ammonia NH3 9 = Hydrogen H2 10 = Ethane C2H6 11 = Propane C3H8 12 = Butane C4H10 13 = Chlorine Cl2 14 = Hydrogen chloride HCl 15 = Carbon monoxide CO 16 = Nitrous oxide N2O 17 = Nitrogen oxide NOx 18 = Hydrogen sulfide H2S 19 = Sulfur hexafluoride SF6 20 = Propylene C3H6 21 = Ozone O3 22 = Others 23 = Ethylene C2H4
Reference sound velocity	7413	Float	Read/write	1...99999.9999
Temperature coefficient sound velocity	7411	Float	Read/write	Positive floating-point number

3.2.5 Sub-menu "External compensation"

Navigation: Expert → Sensor → External compensation				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Pressure compensation	5184	Integer	Read/write	**0 = Off (Default)** 1 = Fixed value 2 = External value
Pressure value	5185	Float	Read/write	Positive floating-point number
External pressure	2440	Float	Read/write	Positive floating-point number
Temperature mode	5515	Integer	Read/write	**0 = Internal measured value (Default)** 1 = External value
External temperature	2507	Float	Read/write	-273.15...99999

3.2.6 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

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	**0 = Cancel (Default)** 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
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

3.2.7 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

3.2.8 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	

Navigation: Expert → Sensor → Testpoints				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
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	
Electronic temperature	2457	Float	Read	
Carrier pipe temperature	9513	Float	Read	
Exciter current 0	9509	Float	Read	
Exciter current 1	9511	Float	Read	
RawMassFlow	10232	Float	Read	

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 = Mass flow (Default)** 74 = Target mass flow 75 = Carrier mass flow
Mass unit	2602	Integer	Read/write	0 = g **1 = kg (Default)*** 2 = t 3 = oz 4 = lb 5 = STon 6 = User mass
Totalizer operation mode	2605	Integer	Read/write	**0 = Net flow total (Default)** 1 = Forward flow total 2 = Reverse flow total

Navigation: Expert → Application → Totalizer 1				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
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 = Mass flow (Default)** 74 = Target mass flow 75 = Carrier mass flow
Mass unit	2802	Integer	Read/write	0 = g **1 = kg (Default)*** 2 = t 3 = oz 4 = lb 5 = STon 6 = User mass
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 = Mass flow (Default)** 74 = Target mass flow 75 = Carrier mass 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**
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

3.4.4 Sub-menu "Concentration"

Navigation: Expert → Application → Concentration				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Concentration damping	2526	Float	Read/write	0...999.9
Concentration unit	2439	Integer	Read/write	**0 = WT-% (Default)*** 2 = °API 3 = °Balling 4 = °Baum (hv) 5 = °Baum (lt) 6 = °Brix 7 = °Plato 8 = User conc.
User concentration text	2585	String	Read/write	
User concentration factor	2554	Float	Read/write	Floating-point number with sign
User concentration offset	2490	Float	Read/write	Floating-point number with sign
A0	2099	Float	Read/write	Floating-point number with sign
A1	2730	Float	Read/write	Floating-point number with sign
A2	2972	Float	Read/write	Floating-point number with sign
A3	2618	Float	Read/write	Floating-point number with sign
A4	2670	Float	Read/write	Floating-point number with sign
B1	2616	Float	Read/write	Floating-point number with sign
B2	2656	Float	Read/write	Floating-point number with sign
B3	2672	Float	Read/write	Floating-point number with sign

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	

Navigation: Expert → Diagnostics				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
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"

Sub-menu "Electronic temperature"

Navigation: Expert → Diagnostics → Min/max values → Electronic temperature				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Minimum value	2421	Float	Read	Floating-point number with sign
Maximum value	2419	Float	Read	Floating-point number with sign

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

Sub-menu "Carrier pipe temperature"

Navigation: Expert → Diagnostics → Min/max values → Carrier pipe temperature				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Minimum value	7533	Float	Read	Floating-point number with sign
Maximum value	7535	Float	Read	Floating-point number with sign

Sub-menu "Oscillation frequency"

Navigation: Expert → Diagnostics → Min/max values → Oscillation frequency				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Minimum value	2459	Float	Read	
Maximum value	2468	Float	Read	

Sub-menu "Torsion oscillation frequency"

Navigation: Expert → Diagnostics → Min/max values → Torsion oscillation frequency				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Minimum value	2519	Float	Read	
Maximum value	2517	Float	Read	

Sub-menu "Oscillation amplitude"

Navigation: Expert → Diagnostics → Min/max values → Oscillation amplitude				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Minimum value	2472	Float	Read	
Maximum value	2470	Float	Read	

Sub-menu "Torsion oscillation amplitude"

Navigation: Expert → Diagnostics → Min/max values → Torsion oscillation amplitude				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Minimum value	2515	Float	Read	
Maximum value	2480	Float	Read	

Sub-menu "Oscillation damping"

Navigation: Expert → Diagnostics → Min/max values → Oscillation damping				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Minimum value	2478	Float	Read	
Maximum value	2423	Float	Read	

Sub-menu "Torsion oscillation damping"

Navigation: Expert → Diagnostics → Min/max values → Torsion oscillation damping				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Minimum value	2523	Float	Read	
Maximum value	2521	Float	Read	

Sub-menu "Signal asymmetry"

Navigation: Expert → Diagnostics → Min/max values → Signal asymmetry				
Parameter	**Register**	**Data type**	**Access**	**Selection/Default**
Minimum value	2474	Float	Read	
Maximum value	2476	Float	Read	

3.5.5 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 = Mass flow 4 = Density 7 = Temperature 73 = Concentration 74 = Target mass flow 75 = Carrier mass flow
Value process variable	6814	Float	Read/write	
Simulation device alarm	6812	Integer	Read/write	**0 = Off (Default)** 1 = On

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