

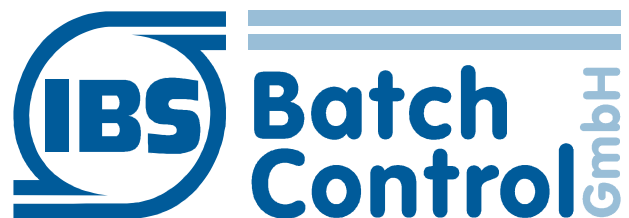
Batching Master xx0 (i)



Revision 052

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Attention!

Important!

These instructions should be used in conjunction with the Standard Installation and Operating Instructions for the Batching Master.

Table of Contents

1. General Informations.....	4
1.1. Reading / Writing.....	4
1.2. Modbus protocol type.....	4
1.3. Baud rate.....	4
1.4. Fixed interface settings.....	5
1.5. Connection of the interface.....	5
1.6. Required cable types.....	5
2. Coil Data (Basis 0xxxx).....	6
2.1. Read.....	6
2.2. Write in order to switch digital outputs.....	6
2.3. Write in order to switch the LEDs in the function keys.....	6
3. Input Status (Basis 1xxxx).....	6
4. Holding Register (Basis 4xxxx).....	7
4.1. General overview.....	7
4.1.1. Actual data for a standard device.....	7
4.1.2. Terminal function (optional function).....	7
4.1.3. Printout data of the last batch process.....	7
4.1.4. Actual data for a device with flow conversion function.....	8
4.1.5. Parameter variables.....	8
4.1.6. Actual data of a Pipeline Master.....	8
4.2. Control of a batch process by the Modbus interface.....	9
4.2.1. Sending a pre-set value to the Batching Master.....	9
4.2.2. Sending a pre-set value with the selection of the batch dimension .	9
4.2.3. Start the batch.....	10
4.2.4. Stop the batch.....	10
4.2.5. At a finished batch.....	11
4.2.6. Setting the time at the Batching Master	11
4.3. Working variables.....	12
4.4. Parameter variables.....	17
4.5. Pipeline Master.....	25

1. General Informations

This manual shows the functions and possibilities of the Modbus communication to the Batching Master 110(i) and 210(i).

The Batching Master has two Modbus interfaces:

- The interface 1 is always a Modbus slave interface.
- The interface 2 can either work as a Modbus slave or as a Modbus master interface. As Modbus master the actual process data of the following devices can be read directly:
 - Endress & Hauser Promass 84F
 - Emerson MVD electronics
 - Krohne Optimass MFC 010

1.1. Reading / Writing

The red LED in the RC key indicates the function of the Modbus interface

LED on = read/write

LED off = read only

This function can be selected in menu 2.4.1 of the Batching Master

1.2. Modbus protocol type

The Batching Master has the possibility to communicate in this two protocols:

- Modbus RTU
- Modbus ASCII

This can be selected in menu 2.4.2 for interface 1 and in menu 2.4.6 for interface 2

1.3. Baud rate

The baud rate for both interfaces can be entered between 2400 and 115.200 bps; in menu 2.4.3 for interface 1 and in menu 2.4.8 for interface 2

Attention:

The intrinsically safe batch controllers Batching Master 110i and 210i have intrinsically safe TTY current interfaces, which have to be connected to the IPC300i interface modules. These interfaces only work up to a baud rate of 19.200 bps.

1.4. Fixed interface settings

The Batching Master interface works with the following parameters (settings):

For Modbus RTU:

- Data bits: 8
- Stop bits: 1
- Parity: Even

For Modbus ASCII:

- Data bits: 7
- Stop bits: 1
- Parity: Even

1.5. Connection of the interface

Non-Exi devices Batching Master 110 and 210:

The Batching Master 110 and 210 have two RS 485 interfaces each with a terminal for A, B, and GND.

The last Batching Master in the bus has to be terminated with 120 Ohm resistor, connected parallel between the terminals A and B.

Exi devices Batching Master 110i and 210i:

The Batching Master 110 und 210 have two intrinsically safe TTY interfaces with the terminals RxD, TxD and GND. These interfaces have to be connected strictly to the interface and power supply module IPC 300i, witch a RS485 output at the safe side.

For the connection please see the installation manuals of Batching Master and IPC 300i module. Please take care that the TxD (transmit) need to be connected always to the RxD (receive).

The RS 485 interface of the last IPC 300i module in the bus has to be terminated with a 120 Ohm resistor, connected parallel between the terminals A and B.

1.6. Required cable types

These cable requirements have to be observed strictly otherwise we can't guaranty an error-free communication.

Non-Exi devices Batching Master 110 and 210:

A shielded, twisted pair cable with an impedance of 120 Ohm and a cross section of minimal $2 \times 0,5 \text{ mm}^2$ has to be used. The cable shield need to be connected to the potential equalisation PE.

Exi devices Batching Master 110i and 210i:

A shielded cable with a cross section of minimal $3 \times 0,5 \text{ mm}^2$ has to be used. The cable shield need to be connected to the potential equalisation PE.

2. Coil Data (Basis 0xxxx)

2.1. Read

At the Coil Data it is possible to read out the status of the digital outputs 1 – 5 and to read out if the LEDs in the function keys F1-F3 are lightning or not.

2.2. Write in order to switch digital outputs

Via the coil function the supervisory system is able to switch the outputs of the Batching Master in order to realise local operations. This is only possible if the digital outputs DO 1 – DO 5 are programmed in menu 2.3... to “no function”.

2.3. Write in order to switch the LEDs in the function keys

The supervisory system is able to switch the the LEDs in the function keys F1 – F3 “on” and “off” in order to make status indication For this the function of the function keys F1-F3 has to be programmed in 2.7 to “no function”.

Coil no.	Register name	Description	Data type	Access	Modbus func.
1	Digital output 1		Bit	R/W	01, 05
2	Digital output 2		Bit	R/W	01, 05
3	Digital output 3		Bit	R/W	01, 05
4	Digital output 4		Bit	R/W	01, 05
5	Digital output 5		Bit	R/W	01, 05
6	LED F1		Bit	R/W	01, 05
7	LED F2		Bit	R/W	01, 05
8	LED F3		Bit	R/W	01, 05

3. Input Status (Basis 1xxxx)

Via the input status function it is possible to read out if the actual status of the digital inputs Di 1 – Di 5.

Input no.	Register name	Description	Data type	Access	Modbus func.
1	Digital input 1		Bit	R/O	02
2	Digital input 2		Bit	R/O	02
3	Digital input 3		Bit	R/O	02
4	Digital input 4		Bit	R/O	02
5	Digital input 5		Bit	R/O	02

4. Holding Register (Basis 4xxxx)

The following part of the manual part of the manual explains the possibilities of the Modbus communication via the Holding Registers. Some of them can only be read (R/O) and others can also be written (R/W).

4.1. General overview

This chapter gives a first overview which parts of the Holding Registers are used for which functionalities.

4.1.1. Actual data for a standard device

If you use a standard Batching Master without *Flow Conversion Function* between mass, volume and standard volume, then you find al important information for the loading process in the Holding Registers 1 – 61.

4.1.2. Terminal function (optional function)

With the terminal function it is possible to switch off the batch function of the Batching Master, when no active batch is started. In this terminal mode it is possible to use the device as an HMI (**H**uman **M**achine **I**nterface). Then the supervisory is able to indicate texts via ASCII commands at the display and the user is able to make inputs via the key path, which will be transmitted to the supervisory system.

Examples:

```
CODE: *****  
PLEASE ENTER!
```

```
PRODUCT: HCL50%  
F1=OK F3=ABORT
```

If you want to realise such a communication, please contact your local sales partner, he will forward you a special explanation how to handle the terminal function.

4.1.3. Printout data of the last batch process

When the batch controller is used in the custody transfer mode, then the Batching Master provides the information of the last batch process in the Holding Registers 92 – 142. This data can be used to make printouts of the delivery papers or to store the batch data in the system.

Attention:

If a printer communication controller PCC 300 or PCC 400 is connected to the Batching Master, then this address range is reserved for the PCC communication and the top system is only allowed to read data not to write.

4.1.4. Actual data for a device with flow conversion function

If the option “flow conversion between mass, volume and standard volume” is activated at the Batching Master, then all important information for the loading process are shown in the Holding Registers 201 to 233.

4.1.5. Parameter variables

In the Holding Registers 1000 to 1318 all programmed parameters and settings of the Batching Masters are shown. It is possible to change most of this settings by the in Modbus communication.

Storing of parameter changes:

Changes of the parameters and settings will be stored and activated in the Batching Master, when the value “1” will be written into Holding Register 62 “safe parameters”.

Attention:

If the programming of a Batching Master for “custody transfer” will be blocked by the programming switch, then it is not more possible to change the parameters of the install, linearisation and flow conversion menu by Modbus.

4.1.6. Actual data of a Pipeline Master

The Batching Master has an optional function called Pipeline Master. Then the Batching Master reads the 3 counter blocks and all process data from a mass flow meter system via the second Modbus interface. The indicated data are shown in the Holding Registers 2000 – 2064. Then the Batching Master has no batch functionality.

4.2. Control of a batch process by the Modbus interface

4.2.1. Sending a pre-set value to the Batching Master

Action	Reaction
After a finished batch, the status in H-Reg. 15 is 1 (<i>input pre-selection</i>)	
Send the pre-set value as a 32 bit long integer to the H-Reg. 53 and 54.	No reaction
Write the value 1 into H-Reg. 55 to activate the new pre-set value.	<ol style="list-style-type: none"> 1. The first display line shows the new pre-set value and the second line shows a batched quantity of "0". 2. The status in H-Reg. 15 gets the value 2 (<i>ready for start</i>)

4.2.2. Sending a pre-set value with the selection of the batch dimension

Action	Reaction
After a finished batch, the status in H-Reg. 15 is 1 (<i>input pre-selection</i>)	
Selection of the batch dimension:	
Write the value 1 into Holding Register 56 to reset the Batching Master	<ol style="list-style-type: none"> 1. The status H-Reg. 15 shows the value 25 (<i>selection of the batch dimension</i>) 2. The display of the Batching Master shows in the first line "Batch dimension:" and the second line shows the last used batch dimension like "mass", "volume" or "standard volume".
Now it is possible to change the batch dimension by writing the following values into H-Reg. 17: 0 = (<i>mass</i>) , 1 = (<i>volume</i>) 2 = (<i>standard volume</i>)	At the same time when the value is changed, then the indicated dimension in the second display line of the Batching Master shows the new selected batch dimension.
Write the value 1 into H-Reg. 57 to confirm the batch dimension by the set-flag.	<ol style="list-style-type: none"> 1. The status in H-Reg. 15 shows again the value "1" (<i>input pre-selection</i>). 2. The display of the Batching Master shows a pre-set value of 0 and the last batched quantity
Transmitting of the pre-set value to the Batching Master:	
Send the pre-set value as a 32 bit long integer to the H-Reg. 53 and 54.	No reaction

Write the value 1 into H-Reg. 55 for the activation of the new pre-set value.	<ol style="list-style-type: none"> 1. The first display line shows the new pre-set value with right unit and the 2. display line shows a batched quantity of "0" 2. The status in H-Reg. 15 gets the value 2 (<i>ready for start</i>)
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4.2.3. Start the batch

Action	Reaction
The status in H-Reg. 15 need to have the value 2 (<i>ready for start</i>) or value 17 (<i>batch interrupted</i>)	
Write the value 1 into H-Reg. 58 for the batch start	<ol style="list-style-type: none"> 1. The status in H-Reg. 15 gets the value 7 (<i>batch started</i>) 2. A "b" is shown on the left side of the second display line, this indicates a started batch. 3. The Batching Master switches it's digital control outputs and the 4-20 mA valve output opens.

4.2.4. Stop the batch

Action	Reaction
The status in H-Reg. 15 need to be value 7 (<i>batch started</i>)	
Write the value 1 into H-Reg. 59 to stop the batch.	<ol style="list-style-type: none"> 1. The status in H-Reg. 15 gets the value 17 = (<i>batch interrupted</i>) 2. The "b" on the left side of the second display line disappears. 3. The Batching Master switches off it's digital control outputs and the 4-20 mA valve output close.
For the re-start of the batch please look in 4.2.3	

4.2.5. At a finished batch

Action	Reaction
The batch process is finished, when the batched quantity in the second display line reached the pre-set value or when the pre-set value will be deleted at a stopped batch process by writing the value 1 into H-Reg. 56 (Reset)	If in menu 4.11.2 a waiting time for the printout is programmed, then the status of H-Reg. 15 goes to the value 20 (waiting for printout) for the programmed time.
	<ol style="list-style-type: none"> 1. After the waiting time for the printout the status of H-Reg. 15 goes back to the value 1 (<i>input of the pre-selection</i>). 2. The Batching Master provides the information of the last batch process in the H-Registers 92 - 142. This data can be used to make a printout of the batch data or to store them in the system.
Then the Batching Master is ready for a new batch process.	

4.2.6. Setting the time at the Batching Master

The Batching Master has no own real time clock inside.

If a printer communication controller PCC300 or PCC400 is connected, then the PCC sets the internal clock of the Batching Master before each batch process and at a restart after a communication- or power-failure.

If only a supervisory system is connected and this system wants to store or to print the batch information from Modbus Holding Registers 101 – 142, then it is necessary to write the actual time once per day and after each power- or communication-failure in the Holding Registers 92-98, like described in the Holding Register list.

Otherwise the date/time for the “batch start” and the “batch end” deliver wrong information.

4.3. Working variables

Reg. no.	Description	Data type	Access	Modbus function
1	Device identification, value '5' for the Batching Master	16 Bit Int	R/O	3
2	Version number e. g. 209 for version 2.09	16 Bit Int	R/O	3
3	Device number LSW	32 Bit Int	R/O	3
4	Device number MSW		R/O	3
5	Error (32bit) – one bit is one failure b0- EEPROM failure b1- Sensor break NK1 b2- Sensor break NK2 b3- Sensor break mA1 b4- Sensor break mA2 b5- Sensor break mA3 b6- Overrange mA1	b7- Overrange mA2 b8- Overrange mA3 b9- Not used b10- Minimal flow rate b11- Ext. Error b12- Release 1 b13- Release 2 b14- Over batching b15- Off-Switch	32 Bit R/O	3
6	Error – bits 16-31 b16- Printer Err b17- Pre-selection to less b18-Pre-selection to great b19- Impulse failure (double pulses) b20- Batching conforming missing B21- Printer communication error	b22-Printer busy b23-Printer paper out b21 to b23 see Reg. no. 52 b24 Product selection (Din) b25 Extended area crc bad b26 API calculation error b27 External sensor error b28 Valve not open b29 Valve not closed	R/O	3
7	Totaliser LSW	32 Bit Int	R/O	3
8	Totaliser MSW		R/O	3
9	Actual flow rate LSW	32 Bit Int	R/O	3
10	Actual flow rate MSW		R/O	3
11	Batched quantity LSW	32 Bit Int	R/O	3
12	Batched quantity MSW		R/O	3
13	Pre-selection LSW	32 Bit Int	R/O	3
14	Pre-selection MSW		R/O	3
15	The batching status is shown 0- 'Very First Start' – first press RESET (only in the factory possible) 1- Pre-selection input 2- Ready for start 5- Purge (after reset) 6- Purge (after set) 7- Batch started 8- Waiting for release (Special function 4) 9- Waiting for release (Special function 2) 10- Waiting for release (Special function 1,3) 11- Delay (SF 4) 12- Batch started (Special function 4) 13- Batch started (SF 2) 14- Batch started (SF 1,3) 15- Error	16- Error (batch can be start after debugging e. g. no release, printer no paper, ...) 17- Batch interrupted (STOP-Taste) 18- pursing in batch pause 19- pursing and ready to start 20- Waiting time for the printout after batch end 21- Product selection 22- Wait for stop (SF2) 23- Waiting time after batch (SF2) 24- free 25- Select. batch dimension 26- Sub value-T. enter/indic. 27- Sub value-D. enter/indic. 28- Sub value-P. enter/indic.	16 Bit Int R/O	3

Reg. no.	Description	Data type	Access	Modbus function
16	Batching indication: This flag has the same functionality like the batch indication of a digital output. Please see menu 1.6.0 batch indication of the programming manual. The value become 1 at the batch start and when the batch is finished then the value goes back to 0.	Flag	R/O	3
17	Batch dimension with the following values: 0 = mass, 1 = volume 2 = standard volume.	16 Bit Int	R/W	03, 06, 16
18	Acknowledge flag at the end of the batch. After the end of the batch this register has the value 1. This value has to be reset to 0 by the supervisory system. Only then a start of a new batch is possible. For this function the option "custody transfer" has to be activated in the factory menu 8.4.	16 Bit Int	R/W	03, 06, 16
19	Checksum custody transfer LSW	16 Bit Int	R/O	3
20	Checksum custody transfer MSW	16 Bit Int	R/O	3
21	Checksum all parameters LSW	16 Bit Int	R/O	3
22	Checksum all parameters MSW	16 Bit Int	R/O	3
23	AD-converter: analog input 1 (rough value)	16 Bit Int	R/O	3
24	AD-converter: analog input 2 (rough value)	16 Bit Int	R/O	3
25	AD-converter: analog input 3 (rough value)	16 Bit Int	R/O	3
26	Analogue input 1, calibrated value standardised (value 0-10000 = 0%-100% input signal)	16 Bit Int	R/O	3
27	Analogue input 2, calibrated value standardised (value 0-10000 = 0%-100% input signal)	16 Bit Int	R/O	3
28	Analogue input 3, calibrated value standardised (value 0-10000 = 0%-100% input signal)	16 Bit Int	R/O	3
29	flow rate, standardised (value 0-10000 = 0%-100%)	16 Bit Int	R/O	3
30	Pulse input 1, actual frequency (LSW)	32 Bit Int	R/O	3
31	Pulse input 1, actual frequency (MSW)		R/O	3
32	Pulse input 2, actual frequency (LSW)	32 Bit Int	R/O	3
33	Pulse input 2, actual frequency (MSW)		R/O	3
34	Analogue output, actual value standardised (value 0-10000 = 4-20 mA output)	16 Bit Int	R/O	3
35	Digital switch off point 1 active (Shut off 1)	Flag	R/O	3
36	Digital switch off point 2 active (Shut off 2)	Flag	R/O	3
37	Digital switch off point 3 active (Shut off 3)	Flag	R/O	3
38	Flow alarm active (see parameter menu 1.5)	Flag	R/O	3
39	Fixed pre-selection active (0-normal input, 1-3 fixed pre-selection)	16 Bit Int	R/O	3
40	0= Interface Read-Only 1= Read/Write	Flag	R/O	3
41	Fixed setpoint limiting controller (actual value)	16 Bit Int	R/O	3
42	Fixed setpoint flow controller (actual value)	16 Bit Int	R/O	3
43	Product selection (actual value)	16 Bit Int	R/O	3
44	Selection F1-F3 (Reg. No. 15 must be 21), write the value 1-3, confirmation via SET (Reg. No. 57) required	16 Bit Int	R/W	03, 06, 16
45-46	Reserve		R/O	3
47	Reserved for PCC		R/O	3
48	Reserved for PCC		R/O	3
49-50	Reserve		R/O	3
51	Reserved for PCC (request every 10 s).	Flag	R/W	03, 06, 16
52	Error number from interface if register 51 is not set 0 no communication over the interface 1 printer error, 2 printer busy, 3 Paper out This error is checked at start. If a failure is signed, the batch cannot be started.	16 Bit Int	R/W	03, 06, 16

Holding Register (Basis 4xxxx)

Reg. no.	Description	Data type	Access	Modbus function
53	External pre-selection input LSW	16 Bit Int	R/W	03, 06, 16
54	External pre-selection input MSW	16 Bit Int	R/W	03, 06, 16
55	Activation flag of the new pre-set value written in the registers 53 and 54	Flag	R/W	03, 06, 16
56	External RESET - function	Flag	R/W	03, 06, 16
57	External SET - function	Flag	R/W	03, 06, 16
58	External START - function	Flag	R/W	03, 06, 16
59	External STOP - function	Flag	R/W	03, 06, 16
60	Reset totaliser	Flag	R/W	03, 06, 16
61	Purge function value 1 = ON / 0 = OFF	Flag	R/W	03, 06, 16
62	Save parameters	Flag	R/W	03, 06, 16
63	Function keys – single bits are indicate if a corresponding key was pressed. The value has to be reset by the supervisory system to the value 0. b0 – F1, b1 – F2, b2 – F3, b3 – RC	Bits	R/W	03, 06, 16
64	Terminal flag, if 1 terminal function active (not possible during an active batch)	Flag	R/W	03, 06, 16
65	Display indication in the terminal mode: bit0-bit7 = ASCII value for 1. character of the 1. line bit8-bit15 = ASCII value for 2. character of the 1. line	16 Bit Int	R/W	03, 06, 16
66	3. and 4. character in the 1 display line in terminal mode	16 Bit Int	R/W	03, 06, 16
67	5. and 6. character in the 1 display line in terminal mode	16 Bit Int	R/W	03, 06, 16
68	7. and 8. character in the 1 display line in terminal mode	16 Bit Int	R/W	03, 06, 16
69	9. and 10. character in the 1 display line in terminal m.	16 Bit Int	R/W	03, 06, 16
70	11. and 12. character in the 1 display line in terminal m.	16 Bit Int	R/W	03, 06, 16
71	13. and 14. character in the 1 display line in terminal m.	16 Bit Int	R/W	03, 06, 16
72	15. and 16. character in the 1 display line in terminal m.	16 Bit Int	R/W	03, 06, 16
73	Display indication in the terminal mode: bit0-bit7 = ASCII value for 1. character of the 2. line bit8-bit15 = ASCII value for 2. character of the 2. line	16 Bit Int	R/W	03, 06, 16
74	3. and 4. character in the 2 display line in terminal mode	16 Bit Int	R/W	03, 06, 16
75	5. and 6. character in the 2 display line in terminal mode	16 Bit Int	R/W	03, 06, 16
76	7. and 8. character in the 2 display line in terminal mode	16 Bit Int	R/W	03, 06, 16
77	9. and 10. character in the 2 display line in terminal m.	16 Bit Int	R/W	03, 06, 16
78	11. and 12. character in the 2 display line in terminal m.	16 Bit Int	R/W	03, 06, 16
79	13. and 14. character in the 2 display line in terminal m.	16 Bit Int	R/W	03, 06, 16
80	15. and 16. character in the 2 display line in terminal m.	16 Bit Int	R/W	03, 06, 16
81	Reset key board buffer (Reg. no. 82 to 91)	Flag	R/W	03, 06, 16
82	Function keys at terminal mode (Bitmap) b0 – SET b1 – Start b2 – Stop b3 – F1 b4 – F2 b5 – F3 b6 – ▲ b7 – ▼ b8 – ◀ b9 – ➤ b10 – Reset b11 – RC b12 – # b13 – Menu	Bits	R/W	03, 06, 16
83	Key board buffer pointer	16 Bit Int	R/W	03, 06, 16
84	Key board buffer in "Terminal Mode" (numeric keys): bit0-bit7 = ASCII value for the 1. key bit8-bit15 = ASCII value for the 2. key	16 Bit Int	R/W	03, 06, 16
85	3. and 4. key in the key board buffer (ASCII „0“ to „9“)	16 Bit Int	R/W	03, 06, 16
86	5. and 6. key in the key board buffer (ASCII „0“ to „9“)	16 Bit Int	R/W	03, 06, 16
87	7. and 8. key in the key board buffer (ASCII „0“ to „9“)	16 Bit Int	R/W	03, 06, 16
88	9. and 10. key in the key board buffer (ASCII „0“ to „9“)	16 Bit Int	R/W	03, 06, 16
89	11. and 12. key in the key board buffer (ASCII „0“ to „9“)	16 Bit Int	R/W	03, 06, 16
90	13. and 14. key in the key board buffer (ASCII „0“ to „9“)	16 Bit Int	R/W	03, 06, 16
91	15. and 16. key in the key board buffer (ASCII „0“ to „9“)	16 Bit Int	R/W	03, 06, 16
92	Time setting - seconds	16 Bit Int	R/W	03, 06, 16
93	Time setting - minutes	16 Bit Int	R/W	03, 06, 16

Reg. no.	Description	Data type	Access	Modbus function
94	Time setting - hours	16 Bit Int	R/W	03, 06, 16
95	Date setting - day	16 Bit Int	R/W	03, 06, 16
96	Date setting - month	16 Bit Int	R/W	03, 06, 16
97	Date setting - year	16 Bit Int	R/W	03, 06, 16
98	Time/date setting – activation flag for registers 92-97	Flag	R/W	03, 06, 16
99	Reserve	16 Bit Int	R/W	03, 06, 16
100	Reserve	16 Bit Int	R/W	03, 06, 16
101	Station name of the Batching Master bit0-bit7 = ASCII value for 1. character of the name bit8-bit15 = ASCII value for 2. character of the name	16 Bit Int	RO	03
102	Station name 3. and 4 character	16 Bit Int	RO	03
103	Station name 5. and 6 character	16 Bit Int	RO	03
104	Station name 7. and 8 character	16 Bit Int	RO	03
105	Station name 9. and 10 character	16 Bit Int	RO	03
106	Station name 11. and 12 character	16 Bit Int	RO	03
107	Station name 13. and 14 character	16 Bit Int	RO	03
108	Station name 15. and 16 character	16 Bit Int	RO	03
109	Station name 17. and 18 character	16 Bit Int	RO	03
110	Station name 19. and 20 character	16 Bit Int	RO	03
111	Start time second (of the last batch)	16 Bit Int	RO	03
112	Start time minutes (of the last batch)	16 Bit Int	RO	03
113	Start time hours (of the last batch)	16 Bit Int	RO	03
114	Start time day (of the last batch)	16 Bit Int	RO	03
115	Start time month (of the last batch)	16 Bit Int	RO	03
116	Start time year (of the last batch)	16 Bit Int	RO	03
117	End time second (of the last batch)	16 Bit Int	RO	03
118	End time minutes (of the last batch)	16 Bit Int	RO	03
119	End time hours (of the last batch)	16 Bit Int	RO	03
120	End time day (of the last batch)	16 Bit Int	RO	03
121	End time month (of the last batch)	16 Bit Int	RO	03
122	End time year (of the last batch)	16 Bit Int	RO	03
123	Batch number LSW (of the last batch)	32 Bit Int	RO	03
124	Batch number MSW (of the last batch)		RO	03
125	Batch pre-set value LSW (of the last batch)	32 Bit Int	RO	03
126	Batch pre-set value MSW (of the last batch)		RO	03
127	Last error code (of the last batch)	16 Bit Int	RO	03
128	Bits 15-8: unit (see #1112), bits 7-0 decimal point	16 Bit Int	RO	03
129	Batched quantity in mass LSW (of the last batch)	32 Bit Int	RO	03
130	Batched quantity in mass MSW (of the last batch)		RO	03
131	Batched quantity in volume LSW (of the last batch)	32 Bit Int	RO	03
132	Batched quantity in volume MSW (of the last batch)		RO	03
133	Batched quantity in standard volume LSW (last batch)	32 Bit Int	RO	03
134	Batched quantity in standard volume MSW (last batch)		RO	03
135	Reserve	16 Bit Int	RO	03
136	Reserve	16 Bit Int	RO	03
137	Reserve	16 Bit Int	RO	03
138	Reserve	16 Bit Int	RO	03
139	Reference temperature (of the last batch)	16 Bit Int	RO	03
140	Average density LSW (of the last batch)	32 Bit Int	RO	03
141	Average density MSW (of the last batch)		RO	03
142	Average temperature (of the last batch)	16 Bit Int	RO	03
143	Product selection, selected product (of the last batch) Special function with PCC 300			
144- 149	Reserve	16 Bit Int	RO	03
150	CRC checksum	16 Bit Int	RO	03
151- 200	Reserve			

Reg. no.	Description	Data type	Access	Modbus function
201	Error LSW (see #5)	16 Bit Int	RO	03
202	Error MSW (see #6)	16 Bit Int	RO	03
203	Batching Master status (see #15)	16 Bit Int	RO	03
204	Batch indication (see #16)	Flag	RO	03
205	Pre-set value LSW (see #13)	16 Bit Int	RO	03
206	Pre-set value MSW (see #14)	16 Bit Int	RO	03
207	Batched quantity in mass LSW	32 Bit Int	RO	03
208	Batched quantity in mass MSW		RO	03
209	Batched quantity in volume LSW	32 Bit Int	RO	03
210	Batched quantity in volume MSW		RO	03
211	Batched quantity in standard volume LSW	32 Bit Int	RO	03
212	Batched quantity in standard volume MSW		RO	03
213	Actual density with 2 decimal points LSW (kg/m3)	32 Bit Int	RO	03
214	Actual density with 2 decimal points MSW (kg/m3)		RO	03
215	Average density with 2 decimal points LSW (kg/m3)	32 Bit Int	RO	03
216	Average density with 2 decimal points MSW		RO	03
217	Actual temperature with one decimal point	16 Bit Int	RO	03
218	Temperature input for simulation without decimal point For this in menu "4.1.2 Temperature" the setting "Modbus-Slave" has to be done	16 Bit Int	R / W	03, 06, 16
219	Actual pressure with 2 decimal points	16 Bit Int	RO	03
220	Pressure input for simulation with 2 decimal points For this in menu "4.1.4 Pressure" the setting "Modbus-Slave" has to be done	16 Bit Int	R / W	03, 06, 16
221	Actual mass flow rate LSW	32 Bit Int	RO	03
222	Actual mass flow rate MSW		RO	03
223	Actual volume flow rate LSW	32 Bit Int	RO	03
224	Actual volume flow rate MSW		RO	03
225	Actual standard volume flow rate LSW	32 Bit Int	RO	03
226	Actual standard volume flow rate MSW		RO	03
227	Totaliser LSW (see #7)	32 Bit Int	RO	03
228	Totaliser MSW (see #8)		RO	03
229	Flow rate input for simulation The value 0-10000 = 0-100% of the measuring range For this in menu "4.1.1 Flow" the setting "Modbus-Slave" has to be done	16 Bit Int	R / W	03, 06, 16
230	Density input for simulation LSW kg/m3 with two decimal places For this in menu "4.1.3 Density" the setting "Modbus-Slave" has to be done	32 Bit Int	R / W	03, 06, 16
231	Density input for simulation MSW kg/m3 with two decimal places		R / W	03, 06, 16
232	Calculated reference density LSW kg/m3 with two decimal places	32 Bit Int	RO	03
233	Calculated reference density MSW kg/m3 with two decimal places		RO	03
234	Sub-value active: Bit0=Press., Bit1=Dens., Bit2= Temp.	16 Bit Int	RO	03
235	Sub-value input pressure	16 Bit Int	R / W	03, 06, 16
236	Sub-value input temperature	16 Bit Int	R / W	03, 06, 16
237	Sub-value input density LSW kg/m3 with two decimal places	32 Bit Int	R / W	03, 06, 16
238	Sub-value input density MSW		R / W	03, 06, 16
239	Totaliser mass LSW	32 Bit Int	RO	03
240	Totaliser mass MSW		RO	3
241	Totaliser volume LSW	32 Bit Int	RO	03
242	Totaliser volume MSW		RO	3
243	Totaliser standard volume LSW	32 Bit Int	RO	03

Reg. no.	Description	Data type	Access	Modbus function
244	Totaliser standard volöume MSW		RO	3
245-250	Reserve			
301-500	Text buffer	16 Bit Int	R / W	03, 06, 16

4.4. Parameter variables

Reg. no.	Description	Data type	Access	Modbus function
1001	Shut-off analogue 1 / Quantity before the end MSW	32 Bit Int	R/W	03, 06, 16
1002	Shut-off analogue 1 / Quantity before the end MSW		R/W	03, 06, 16
1003	Shut-off analogue 2 / Quantity before the end LSW	32 Bit Int	R/W	03, 06, 16
1004	Shut-off analogue 2 / Quantity before the end MSW		R/W	03, 06, 16
1005	Shut-off analogue 3 / Quantity before the end LSW	32 Bit Int	R/W	03, 06, 16
1006	Shut-off analogue 3 / Quantity before the end MSW		R/W	03, 06, 16
1007	Shut-off analogue 4 / Quantity before the end LSW	32 Bit Int	R/W	03, 06, 16
1008	Shut-off analogue 4 / Quantity before the end MSW		R/W	03, 06, 16
1009	Shut-off analogue 5 / Quantity before the end LSW	32 Bit Int	R/W	03, 06, 16
1010	Shut-off analogue 5 / Quantity before the end MSW		R/W	03, 06, 16
1011	Shut-off analogue 1 / mA value to the valve (400-2000 = 4.00-20.00 mA)	16 Bit Int	R/W	03, 06, 16
1012	Shut-off analogue 1 / mA value to the valve (400-2000 = 4.00-20.00 mA)	16 Bit Int	R/W	03, 06, 16
1013	Shut-off analogue 1 / mA value to the valve (400-2000 = 4.00-20.00 mA)	16 Bit Int	R/W	03, 06, 16
1014	Shut-off analogue 1 / mA value to the valve (400-2000 = 4.00-20.00 mA)	16 Bit Int	R/W	03, 06, 16
1015	Shut-off analogue 1 / mA value to the valve (400-2000 = 4.00-20.00 mA)	16 Bit Int	R/W	03, 06, 16
1016	Working method for analogue shut-off steps with active flow controller 0 = Input in mA-steps 1 = Input in flow rate set points	16 Bit Int	R/W	03, 06, 16
1017	Time for batch indicating pulse in 0.1 seconds	16 Bit Int	R/W	03, 06, 16
1018	Reserve	16 Bit Int	R/W	03, 06, 16
1019	Reserve	16 Bit Int	R/W	03, 06, 16
1020	Language	16 Bit Int	R/W	03, 06, 16
1021	Shut-off 1 digital LSW	32 Bit Int	R/W	03, 06, 16
1022	Shut-off 1 digital MSW		R/W	03, 06, 16
1023	Shut-off 2 digital LSW	32 Bit Int	R/W	03, 06, 16
1024	Shut-off 2 digital MSW		R/W	03, 06, 16
1025	Shut-off 3 digital LSW	32 Bit Int	R/W	03, 06, 16
1026	Shut-off 3 digital MSW		R/W	03, 06, 16
1027	Start-up ramp 4-20 mA output to valve in seconds	16 Bit Int	R/W	03, 06, 16
1028	Shut down ramp 4-20 mA output to the valve in s	16 Bit Int	R/W	03, 06, 16
1029	Maximum flow rate alarm LSW	32 Bit Int	R/W	03, 06, 16
1030	Maximum flow rate alarm MSW		R/W	03, 06, 16
1031	Batch indication: 0 = on, 1 = pulse at the end of the batch	16 Bit Int	R/W	03, 06, 16
1032	Maximum overrun quantity LSW	32 Bit Int	R/W	03, 06, 16
1033	Maximum overrun quantity MSW		R/W	03, 06, 16
1034	Control time for overrun quantity in seconds	16 Bit Int	R/W	03, 06, 16
1035	Sensor break activated: 0 = off 1 = on b0-SB_NK1 (pulse input 1) b5-OVER_mA2 b1-SB_NK2 (pulse input 2) b6-SB_mA3, b2-SB_mA1, b7-OVER_mA3	16 Bit Int	R/W	03, 06, 16

Reg. no.	Description	Data type	Access	Modbus function
1036	Function digital Input 1 value at bit 0-b4 = 1 - Set 2 - Start 3 - Set/Start (function only as 'edge') 4 - Stop 5 - Reset 6 - External Error 7 - Totaliser Reset 8 - Release 1 9 - Release 2 10 - Interface enable 11 - KBD disable 12 - Purge 13 - Controller off 14 - Valve open 15 - Valve closed 16 - SF-release (only SF) b13 - Action: 0 = level, 1 = flank b15 - Direction of action 0 = NO, 1 = NC	16 Bit Int	R/W	03, 06, 16
1037	Function digital input 2 see 1036	16 Bit Int	R/W	03, 06, 16
1038	Function digital input 3 see 1036 with following changes from b0 - b4 16 - SF-release (only SF) or pre-selection 2 (SF no SF, fixed pre-selection on) 17- pre-selection 2 (SF active, fixed pre-selection on)	16 Bit Int	R/W	03, 06, 16
1039	Function digital input 4, see 1036 with following changes from b0 - b4 16 - SF-release (only SF) or pre-selection 1 (SF no SF, fixed pre-selection on) 17- pre-selection 1 (SF active, fixed pre-selection on)	16 Bit Int	R/W	03, 06, 16
1040	Function digital input 5 see 1036	16 Bit Int	R/W	03, 06, 16
1041	Function digital output 1 value at bit 0-b4 = 0 - No function 1 - Shut-off 1 2 - Shut-off 2 3 - Shut-off 3 4 - Pulse output 5 - Batching indication 6 - Flow alarm 7 - Error 8 - Shut-off 1 invert 9 - Purge 10 - Additive control b14 - Direction of action: 0 = NO, 1 = NC	16 Bit Int	R/W	03, 06, 16
1042	Function digital output 2 (see register No. 1041)	16 Bit Int	R/W	03, 06, 16
1043	Function digital output 3 (see register No. 1041)	16 Bit Int	R/W	03, 06, 16
1044	Function digital output 4 (see register No. 1041)	16 Bit Int	R/W	03, 06, 16
1045	Function digital output 5 (see register No. 1041)	16 Bit Int	R/W	03, 06, 16
1046	Interface 1 settings: b0-b7 - Modbus address b12, b13 - Protocol b14 - Read only b8,b9, b10 - Baud rate 000: 2400, 001: 4800, 010: 9600, 011:19200 100: 38400, 101:57600 110: 115200)	16 Bit Int	R/W	03, 06, 16
1047	Fixed pre-selection 1 LSW	32 Bit Int	R/W	03, 06, 16
1048	Fixed pre-selection 1 MSW		R/W	03, 06, 16
1049	Fixed pre-selection 2 LSW	32 Bit Int	R/W	03, 06, 16
1050	Fixed pre-selection 2 MSW		R/W	03, 06, 16
1051	Fixed pre-selection 3 LSW	32 Bit Int	R/W	03, 06, 16
1052	Fixed pre-selection 3 MSW		R/W	03, 06, 16
1053	Locking keypad b0 - 0: keypad enable, 1: keypad locked b1 - not used b2 - 0: SET enable, b3 - 0: START enable, b4 - 0: STOP enable, b5 - 0: F1-F3 enable, b6 - 0 Reset enable, b7 - 0 Reset only for error reset enable b8 - 0: 0 to 9 enable	Bits	R/W	03, 06, 16

Holding Register (Basis 4xxxx)

Reg. no.	Description	Data type	Access	Modbus function
1054	Function of the function keys F1-F3: 0 – LED don't switch, signalisation only with interface 1 – LED switch with digital shut-off 2 – Fixed pre-selection values 3 – F1 = Purge 4 – Product selection 5 – Fixed set points flow controller 6 – Fixed set points override controller	16 Bit Int	R/W	03, 06, 16
1055	Shut-off 1 set point for the flow controller LSW	32 Bit Int	R/W	03, 06, 16
1056	Shut-off 1 set point for the flow controller MSW		R/W	03, 06, 16
1057	Shut-off 2 set point for the flow controller LSW	32 Bit Int	R/W	03, 06, 16
1058	Shut-off 2 set point for the flow controller MSW		R/W	03, 06, 16
1059	Shut-off 3 set point for the flow controller LSW	32 Bit Int	R/W	03, 06, 16
1060	Shut-off 3 set point for the flow controller MSW		R/W	03, 06, 16
1061	Shut-off 4 set point for the flow controller LSW	32 Bit Int	R/W	03, 06, 16
1062	Shut-off 4 set point for the flow controller MSW		R/W	03, 06, 16
1063	Shut-off 5 set point for the flow controller LSW	32 Bit Int	R/W	03, 06, 16
1064	Shut-off 5 set point for the flow controller MSW		R/W	03, 06, 16
1065	Reserve			
1066	Delay time for monitoring the valve position feedback signal "valve open" after batch start	16 Bit Int	R/W	03, 06, 16
1067	Delay time for monitoring the valve position feedback signal "valve closed" after the batch end	16 Bit Int	R/W	03, 06, 16
1068	Valve control mode: 0 = analog 4-20 mA output , 1 = 2-step valve	16 Bit Int	R/W	03, 06, 16
1069	Valve cycle in 0.1 s	16 Bit Int	R/W	03, 06, 16
1070	Minimum valve active time	16 Bit Int	R/W	03, 06, 16
1071	Override controller status b0-b2 = function 0 = disabled 1 = Local set point 2 = Remote set point b3, b4 = Decimal point b8 - b10 = Unit b12 = Set point fixed	Bits	R/W	03, 06, 16
1072	Override controller, start value measuring range	16 Bit Int	R/W	03, 06, 16
1073	Override controller, end value measuring range	16 Bit Int	R/W	03, 06, 16
1074	Kp - override controller	16 Bit Int	R/W	03, 06, 16
1075	OP - override controller	16 Bit Int	R/W	03, 06, 16
1076	Kd - override controller	16 Bit Int	R/W	03, 06, 16
1077	Tn - override controller	16 Bit Int	R/W	03, 06, 16
1078	Tv - override controller	16 Bit Int	R/W	03, 06, 16
1079	Set point start value Wa of the override controller	16 Bit Int	R/W	03, 06, 16
1080	Set point end value We of the override controller	16 Bit Int	R/W	03, 06, 16
1081	Set point 1, override controller	16 Bit Int	R/W	03, 06, 16
1082	Set point 2, override controller	16 Bit Int	R/W	03, 06, 16
1083	Set point 3, override controller	16 Bit Int	R/W	03, 06, 16
1084	Actual working set point	16 Bit Int	R/W	03, 06, 16
1085	Interval for additive control (batched quantity)	32 Bit Int	R/W	03, 06, 16
1087	Pulse length for additive control (in 0,1 seconds)	16 Bit Int	R/W	03, 06, 16
1088	Correction factor overrun correction (Menu 1.10.1)	16 Bit Int	R/W	03, 06, 16
1089	Maximal batch failure für overrun correction (Menu 1.10.2)	16 Bit Int	R/W	03, 06, 16
1090	Flow correction overrun correction (Menu 1.10.3)	16 Bit Int	R/W	03, 06, 16
1091	Flow controller b0-b2 = Function 0 = Disable 1 = Local set point 2 = Remote set point b11 = Set point fixed	Bits	R/W	03, 06, 16
1092	Kp - flow controller	16 Bit Int	R/W	03, 06, 16

Reg. no.	Description	Data type	Access	Modbus function	
1093	OP - flow controller	16 Bit Int	R/W	03, 06, 16	
1094	Kd - flow controller	16 Bit Int	R/W	03, 06, 16	
1095	Tn - flow controller	16 Bit Int	R/W	03, 06, 16	
1096	Tv - flow controller	16 Bit Int	R/W	03, 06, 16	
1097	Set point start value (LSW) flow controller	32 Bit Int	R/W	03, 06, 16	
1098	Set point start value (MSW) flow controller		R/W	03, 06, 16	
1099	Set point end value (LSW) flow controller	32 Bit Int	R/W	03, 06, 16	
1100	Set point end value (MSW) flow controller		R/W	03, 06, 16	
1101	Set point 1 (LSW) flow controller	32 Bit Int	R/W	03, 06, 16	
1102	Set point 1 (MSW) flow controller		R/W	03, 06, 16	
1103	Set point 2 (LSW) flow controller	32 Bit Int	R/W	03, 06, 16	
1104	Set point 2 (MSW) flow controller		R/W	03, 06, 16	
1105	Set point 3 (LSW) flow controller	32 Bit Int	R/W	03, 06, 16	
1106	Set point 3 (MSW) flow controller		R/W	03, 06, 16	
1107	Actual working set point (LSW) flow controller	32 Bit Int	R/W	03, 06, 16	
1108	Actual working set point (MSW) flow controller		R/W	03, 06, 16	
1109	Reserve	16 Bit Int	R/W	03, 06, 16	
1110	Reserve	16 Bit Int	R/W	03, 06, 16	
1111	Flow input selection value: 0 = pulse, 1 = double pulse, 2 = 4-20 mA input 1, 3 = Modbus slave 4 = Modbus master	16 Bit Int	R/W	03, 06, 16	
1112	Unit: 0=no, 1=kg, 2=g, 3=mg, 4=l, 5=ml, 6=m3, 7=t	16 Bit Int	R/W	03, 06, 16	
1113	Decimal point	16 Bit Int	R/W	03, 06, 16	
1114	Measuring range (LSW)	32 Bit Int	R/W	03, 06, 16	
1115	Measuring range (MSW)		R/W	03, 06, 16	
1116	Pulse per last digit LSW	32 Bit Int	R/W	03, 06, 16	
1117	Pulse per last digit MSW		R/W	03, 06, 16	
1118	Bit 2..bit 0 pulse output: 0: 1 pulse / last digit, 1: 10 Imp. / last digit, 2: 100 Imp. / last digit, 3: 1000 Imp. / last digit	Bit 8: 0 pulse count output 1 frequency output	Bits	R/W	03, 06, 16
1119	Linearisation function: 0 – no 1 – pulse input	2 – mA input 1 3 – mA input 2 4 – mA input 3	Bits	R/W	03, 06, 16
1120	Min pre-selection LSW	32 Bit Int	R/W	03, 06, 16	
1121	Min pre-selection MSW		R/W	03, 06, 16	
1122	Max pre-selection LSW	32 Bit Int	R/W	03, 06, 16	
1123	Max pre-selection MSW		R/W	03, 06, 16	
1124	Overrun quantity LSW	32 Bit Int	R/W	03, 06, 16	
1125	Overrun quantity MSW		R/W	03, 06, 16	
1126	Minimum flow rate LSW	32 Bit Int	R/W	03, 06, 16	
1127	Minimum flow rate MSW		R/W	03, 06, 16	
1128	Time after start LSW	32 Bit Int	R/W	03, 06, 16	
1129	Time after start MSW		R/W	03, 06, 16	
1130	Time during batch LSW	32 Bit Int	R/W	03, 06, 16	
1131	Time during batch MSW		R/W	03, 06, 16	
1132	Allowed under batching quantity LSW	32 Bit Int	R/W	03, 06, 16	
1133	Allowed under batching quantity MSW	16 Bit Int	R/W	03, 06, 16	
1134	Filter special function rinse	16 Bit Int	R/W	03, 06, 16	
1135	Time to batch	16 Bit Int	R/W	03, 06, 16	
1136	Waiting time	16 Bit Int	R/W	03, 06, 16	
1137	Delay	16 Bit Int	R/W	03, 06, 16	
1138	Counting of the flow rate: 0 = always 1 = only during a batch 2 = only during started batch	16 Bit Int	R/W	03, 06, 16	

Holding Register (Basis 4xxxx)

Reg. no.	Description	Data type	Access	Modbus function
1139	b0-printout (yes/no) b1-abort conditions . (1-no new start possible)	16 Bit Int	R/W	03, 06, 16
1140	Delay for printout (time in seconds)	16 Bit Int	R/W	03, 06, 16
1141	Confirm end of batch	16 Bit Int	R/W	03, 06, 16
1142	Value of pulses per error pulses LSW	32 Bit Int	R/W	03, 06, 16
1143	Value of pulses per error pulses MSW		R/W	03, 06, 16
1144	COM Status 2 b0-b7 address, b8-b10 baud rate, b12 protocol (0 – RTU, 1 – ASCII, in master mode only RTU) b13 ... b15 - 0 slave (function like COM1), 1 = master for Promass 84F 2 = master for Krohne MFC010 3 = master for Emerson Micromotion	Bits	R/W	03, 06, 16
1145	Main function: 0=Batching Master 1=Pipeline-Master	16 Bit Int	R/W	03, 06, 16
1146	Bit status - activate/deactivate display indications with the flow conversion function (also Pipeline Master old version) Bit 0 – batched quantity in mass Bit 1 – batched quantity in volume Bit 2 – batched quantity in standard volume Bit 3 – actual flow rate in mass Bit 4 – actual flow rate in volume Bit 5 – actual flow rate in standard volume Bit 6 – actual temperature Bit 7 – actual pressure Bit 8 – actual density Bit 9 – average temperature Bit 10 – average Density Bit 11 – actual calculated standard density Bit 12 – totaliser mass Bit 13 – totaliser volume Bit 14 – totaliser standard volume	16 Bit Int	R/W	03, 06, 16
1147	Print cycle	16 Bit Int	R/W	03, 06, 16
1148	Full scale output frequency: 1...10000 equal to 0.01Hz to 100.00Hz	16 Bit Int	R/W	03, 06, 16
1149	Reserve	16 Bit Int	R/W	03, 06, 16
1150	Reserve	16 Bit Int	R/W	03, 06, 16
1151	1. and 2. character for release 1 text	16 Bit Int	R/W	03, 06, 16
1152	3. and 4. character for release 1 text	16 Bit Int	R/W	03, 06, 16
1153	5. and 6. character for release 1 text	16 Bit Int	R/W	03, 06, 16
1154	7. and 8. character for release 1 text	16 Bit Int	R/W	03, 06, 16
1155	9. and 10. character for release 1 text	16 Bit Int	R/W	03, 06, 16
1156	11. and 12. character for release 1 text	16 Bit Int	R/W	03, 06, 16
1157	13. and 14. character for release 1 text	16 Bit Int	R/W	03, 06, 16
1158	15. and 16. character for release 1 text	16 Bit Int	R/W	03, 06, 16
1159	1. and 2. character for release 2 text	16 Bit Int	R/W	03, 06, 16
1160	3. and 4. character for release 2 text	16 Bit Int	R/W	03, 06, 16
1161	5. and 6. character for release 2 text	16 Bit Int	R/W	03, 06, 16
1162	7. and 8. character for release 2 text	16 Bit Int	R/W	03, 06, 16
1163	9. and 10. character for release 2 text	16 Bit Int	R/W	03, 06, 16
1164	11. and 12. character for release 2 text	16 Bit Int	R/W	03, 06, 16
1165	13. and 14. character for release 2 text	16 Bit Int	R/W	03, 06, 16
1166	15. and 16. character for release 2 text	16 Bit Int	R/W	03, 06, 16
1167	1. and 2. character for station name text	16 Bit Int	R/W	03, 06, 16
1168	3. und 4. character for station name text	16 Bit Int	R/W	03, 06, 16
1169	5. und 6. character for station name text	16 Bit Int	R/W	03, 06, 16

Reg. no.	Description	Data type	Access	Modbus function
1170	7. und 8. character for station name text	16 Bit Int	R/W	03, 06, 16
1171	9. und 10. character for station name text	16 Bit Int	R/W	03, 06, 16
1172	11. und 12. character for station name text	16 Bit Int	R/W	03, 06, 16
1173	13. und 14. character for station name text	16 Bit Int	R/W	03, 06, 16
1174	15. und 16. character for station name text	16 Bit Int	R/W	03, 06, 16
1175	17. und 18. character for station name text	16 Bit Int	R/W	03, 06, 16
1176	19. und 20. character for station name text	16 Bit Int	R/W	03, 06, 16
1177	Question text product selection character 1, 2	16 Bit Int	R/W	03, 06, 16
1178	Question text product selection character 3, 4	16 Bit Int	R/W	03, 06, 16
1179	Question text product selection character 5, 6	16 Bit Int	R/W	03, 06, 16
1180	Question text product selection character 7, 8	16 Bit Int	R/W	03, 06, 16
1181	Question text product selection character 9, 10	16 Bit Int	R/W	03, 06, 16
1182	Question text product selection character 11, 12	16 Bit Int	R/W	03, 06, 16
1183	Question text product selection character 13, 14	16 Bit Int	R/W	03, 06, 16
1184	Question text product selection character 15, 16	16 Bit Int	R/W	03, 06, 16
1185	Text product name 1 character 1, 2	16 Bit Int	R/W	03, 06, 16
1186	Text product name 1 character 3, 4	16 Bit Int	R/W	03, 06, 16
1187	Text product name 1 character 5, 6	16 Bit Int	R/W	03, 06, 16
1188	Text product name 1 character 7, 8	16 Bit Int	R/W	03, 06, 16
1189	Text product name 1 character 9, 10	16 Bit Int	R/W	03, 06, 16
1190	Text product name 1 character 11,12	16 Bit Int	R/W	03, 06, 16
1191	Text product name 1 character 13, 14	16 Bit Int	R/W	03, 06, 16
1192	Text product name 1 character 15, 16	16 Bit Int	R/W	03, 06, 16
1193	Text product name 2 character 1, 2	16 Bit Int	R/W	03, 06, 16
1194	Text product name 2 character 3, 4	16 Bit Int	R/W	03, 06, 16
1195	Text product name 2 character 5, 6	16 Bit Int	R/W	03, 06, 16
1196	Text product name 2 character 7, 8	16 Bit Int	R/W	03, 06, 16
1197	Text product name 2 character 9, 10	16 Bit Int	R/W	03, 06, 16
1198	Text product name 2 character 11,12	16 Bit Int	R/W	03, 06, 16
1199	Text product name 2 character 13, 14	16 Bit Int	R/W	03, 06, 16
1200	Text product name 2 character 15, 16	16 Bit Int	R/W	03, 06, 16
1201	Text product name 3 character 1, 2	16 Bit Int	R/W	03, 06, 16
1202	Text product name 3 character 3, 4	16 Bit Int	R/W	03, 06, 16
1203	Text product name 3 character 5, 6	16 Bit Int	R/W	03, 06, 16
1204	Text product name 3 character 7, 8	16 Bit Int	R/W	03, 06, 16
1205	Text product name 3 character 9, 10	16 Bit Int	R/W	03, 06, 16
1206	Text product name 3 character 11,12	16 Bit Int	R/W	03, 06, 16
1207	Text product name 3 character 13, 14	16 Bit Int	R/W	03, 06, 16
1208	Text product name 3 character 15, 16	16 Bit Int	R/W	03, 06, 16
1209	Text wait for release character 1, 2	16 Bit Int	R/W	03, 06, 16
1210	Text wait for release character 3, 4	16 Bit Int	R/W	03, 06, 16
1211	Text wait for release character 5, 6	16 Bit Int	R/W	03, 06, 16
1212	Text wait for release character 7, 8	16 Bit Int	R/W	03, 06, 16
1213	Text wait for release character 9, 10	16 Bit Int	R/W	03, 06, 16
1214	Text wait for release character 11, 12	16 Bit Int	R/W	03, 06, 16
1215	Text wait for release character 13, 14	16 Bit Int	R/W	03, 06, 16
1216	Text wait for release character 15, 16	16 Bit Int	R/W	03, 06, 16
1217	Text for delay special function character 1, 2	16 Bit Int	R/W	03, 06, 16
1218	Text for delay special function character 3, 4	16 Bit Int	R/W	03, 06, 16
1219	Text for delay special function character 5, 6	16 Bit Int	R/W	03, 06, 16
1220	Text for delay special function character 7, 8	16 Bit Int	R/W	03, 06, 16
1221	Text for delay special function character 9, 10	16 Bit Int	R/W	03, 06, 16
1222	Text for delay special function character 11, 12	16 Bit Int	R/W	03, 06, 16
1223	Text for delay special function character 13, 14	16 Bit Int	R/W	03, 06, 16
1224	Text for delay special function character 15, 16	16 Bit Int	R/W	03, 06, 16

Holding Register (Basis 4xxxx)

Reg. no.	Description	Data type	Access	Modbus function
1225	Sensor break function sub-value (Flow conversion) b0+b1- temperature, b4+b5- Density, b8+b9- Press. Function: 0= no restart, 1= fix sub-value, 2= manual input	16 Bit Int	R/W	03, 06, 16
1226-1229	Reserve	16 Bit Int	R/W	03, 06, 16
1230	Pressure compensation – calculation mode			
1231	Pressure compensation – base pressure			
1232	Pressure compensation – b-factor			
1233	Pressure compensation – manual cplm			
1237	Temperature input mode 0-none, 1- AIn1, 2-AIn2, 3-AIn3, 4- Modbus interface.	16 Bit Int	R/W	03, 06, 16
1238	Density input mode 0-none, 1- AIn1, 2-AIn2, 3-AIn3, 4- Modbus simulation, 5- Impuls2	16 Bit Int	R/W	03, 06, 16
1239	Pressure input 0-none, 1- AIn1, 2-AIn2, 3-AIn3, 4- Modbus simulat.	16 Bit Int	R/W	03, 06, 16
1240	Batch dimension: Bit 0 – 3 = 0- mass, 1- volume, 2- standard volume, 3- switch able Deactivated value when “switch able” is active: Bit 8-10 = 0-none, 1-mass, 2-volume, 3-standard volume Totaliser dimension: Bit 12-13 = 0- mass, 1- volume, 2- standard volume	16 Bit Int	R/W	03, 06, 16
1241	Temperature input, range begin	32 Bit Int	R/W	03, 06, 16
1242	Temperature input, range end		R/W	03, 06, 16
1243	Density input, range begin LSW	32 Bit Int	R/W	03, 06, 16
1244	Density input, range begin MSW		R/W	03, 06, 16
1245	Density input, range end LSW	32 Bit Int	R/W	03, 06, 16
1246	Density input, range end MSW		R/W	03, 06, 16
1247	Pressure input, range begin	16 Bit Int	R/W	03, 06, 16
1248	Pressure input, range end	16 Bit Int	R/W	03, 06, 16
1249	Density calculation mode: 0- parameter, 1- external input, 2- calculated	16 Bit Int	R/W	03, 06, 16
1250	Density calc. method: 0- linear, 1- API, 2- Biodiesel	16 Bit Int	R/W	03, 06, 16
1251	Reference density LSW	32 Bit Int	R/W	03, 06, 16
1252	Reference density MSW		R/W	03, 06, 16
1253	Factor for Biodiesel calculation	16 Bit Int	R/W	03, 06, 16
1254	Reference temperature	16 Bit Int	R/W	03, 06, 16
1255	Alpha0 factor LSW	32 Bit Int	R/W	03, 06, 16
1256	Alpha0 factor MSW		R/W	03, 06, 16
1257	K0 LSW	32 Bit Int	R/W	03, 06, 16
1258	K0 MSW		R/W	03, 06, 16
1259	K1 LSW	32 Bit Int	R/W	03, 06, 16
1260	K1 MSW		R/W	03, 06, 16
1261	K2 LSW	32 Bit Int	R/W	03, 06, 16
1262	K2 MSW		R/W	03, 06, 16
1263	Density value used when 1249 = 0 LSW	32 Bit Int	R/W	03, 06, 16
1264	Density value MSW		R/W	03, 06, 16
1265	Code for custody transfer key	16 Bit Int	R/W	03, 06, 16
1266	Code – parameter menu LSW	32 Bit Int	R/W	03, 06, 16
1267	Code - parameter menu MSW		R/W	03, 06, 16
1268	Code - structure menu LSW	32 Bit Int	R/W	03, 06, 16
1269	Code - structure menu MSW		R/W	03, 06, 16
1270	Code - controller menu LSW	32 Bit Int	R/W	03, 06, 16

Reg. no.	Description	Data type	Access	Modbus function
1271	Code - controller menu MSW		R/W	03, 06, 16
1272	Code - install menu LSW	32 Bit Int	R/W	03, 06, 16
1273	Code - install menu MSW		R/W	03, 06, 16
1274	Code – calibration menu LSW	32 Bit Int	R/W	03, 06, 16
1275	Code – calibration menu MSW		R/W	03, 06, 16
1276	Code – linearisation menu LSW	32 Bit Int	R/W	03, 06, 16
1277	Code – linearisation menu MSW		R/W	03, 06, 16
1278	Code – set point menu controller LSW	32 Bit Int	R/W	03, 06, 16
1279	Code – set point menu controller MSW		R/W	03, 06, 16
1280	Calibration value mA1 4 mA	16 Bit Int	R/W	03, 06, 16
1281	Calibration value mA1 20 mA	16 Bit Int	R/W	03, 06, 16
1282	Calibration value mA2 4 mA	16 Bit Int	R/W	03, 06, 16
1283	Calibration value mA2 20 mA	16 Bit Int	R/W	03, 06, 16
1284	Calibration value mA3 4 mA	16 Bit Int	R/W	03, 06, 16
1285	Calibration value mA3 20 mA	16 Bit Int	R/W	03, 06, 16
1286	Calibration value analogue output 4 mA	16 Bit Int	R/W	03, 06, 16
1287	Calibration value analogue output 20 mA	16 Bit Int	R/W	03, 06, 16
1288	Linearisation -10%	16 Bit Int	R/W	03, 06, 16
1289	Linearisation -5%	16 Bit Int	R/W	03, 06, 16
1290	Linearisation 0%	16 Bit Int	R/W	03, 06, 16
1291	Linearisation 5%	16 Bit Int	R/W	03, 06, 16
1292	Linearisation 10%	16 Bit Int	R/W	03, 06, 16
1293	Linearisation 15%	16 Bit Int	R/W	03, 06, 16
1294	Linearisation 20%	16 Bit Int	R/W	03, 06, 16
1295	Linearisation 25%	16 Bit Int	R/W	03, 06, 16
1296	Linearisation 30%	16 Bit Int	R/W	03, 06, 16
1297	Linearisation 35%	16 Bit Int	R/W	03, 06, 16
1298	Linearisation 40%	16 Bit Int	R/W	03, 06, 16
1299	Linearisation 45%	16 Bit Int	R/W	03, 06, 16
1300	Linearisation 50%	16 Bit Int	R/W	03, 06, 16
1301	Linearisation 55%	16 Bit Int	R/W	03, 06, 16
1302	Linearisation 60%	16 Bit Int	R/W	03, 06, 16
1303	Linearisation 65%	16 Bit Int	R/W	03, 06, 16
1304	Linearisation 70%	16 Bit Int	R/W	03, 06, 16
1305	Linearisation 75%	16 Bit Int	R/W	03, 06, 16
1306	Linearisation 80%	16 Bit Int	R/W	03, 06, 16
1307	Linearisation 85%	16 Bit Int	R/W	03, 06, 16
1308	Linearisation 90%	16 Bit Int	R/W	03, 06, 16
1309	Linearisation 95%	16 Bit Int	R/W	03, 06, 16
1310	Linearisation 100%	16 Bit Int	R/W	03, 06, 16
1311	Linearisation 105%	16 Bit Int	R/W	03, 06, 16
1312	Linearisation 110%	16 Bit Int	R/W	03, 06, 16
1313	Reserve	16 Bit Int	R/W	03, 06, 16
1314	Reserve	16 Bit Int	R/W	03, 06, 16
1315	Reserve	16 Bit Int	R/W	03, 06, 16
1316	Reserved for internal data	16 Bit Int	R/O	03
1317	Device number LSW	16 Bit Int	R/W	03, 06, 16
1318	Device number MSW	16 Bit Int	R/W	03, 06, 16

4.5. Pipeline Master

Reg. no.	Description	Data type	Access	Modbus function	
2001	Mass flow	Float	RO	03	
2003	Volume flow	Float	RO	03	
2005	Norm volume flow	Float	RO	03	
2007	Density	Float	RO	03	
2009	Norm density	Float	RO	03	
2011	Temperature	Float	RO	03	
2013	Unit mass flow	16 Bit Int	RO	03	
2014	Unit mass	16 Bit Int	RO	03	
2015	Unit volume flow	16 Bit Int	RO	03	
2016	Unit volume	16 Bit Int	RO	03	
2017	Unit norm volume flow	16 Bit Int	RO	03	
2018	Unit norm volume	16 Bit Int	RO	03	
2019	Unit density	16 Bit Int	RO	03	
2020	Unit norm density	16 Bit Int	RO	03	
2021	Unit temperature	16 Bit Int	RO	03	
2022	Function counter 1	16 Bit Int	RO	03	
2023	Unit counter 1 mass	16 Bit Int	RO	03	
2024	Unit counter 1 volume	16 Bit Int	RO	03	
2025	Unit counter 1 norm volume	16 Bit Int	RO	03	
2026	Counter mode 1	16 Bit Int	RO	03	
2027	Counter value 1	Float	RO	03	
2029	Counter overflow 1	Float	RO	03	
2031	Function counter 2	16 Bit Int	RO	03	
2032	Unit counter 2 mass	16 Bit Int	RO	03	
2033	Unit counter 2 volume	16 Bit Int	RO	03	
2034	Unit counter 2 norm volume	16 Bit Int	RO	03	
2035	Counter mode 2	16 Bit Int	RO	03	
2036	Counter value 2	Float	RO	03	
2038	Counter overflow 2	Float	RO	03	
2040	Function counter 3	16 Bit Int	RO	03	
2041	Unit counter 3 mass	16 Bit Int	RO	03	
2042	Unit counter 3 volume	16 Bit Int	RO	03	
2043	Unit counter 3 norm volume	16 Bit Int	RO	03	
2044	Counter mode 3	16 Bit Int	RO	03	
2045	Counter value 3	Float	RO	03	
2047	Counter overflow 3	Float	RO	03	
2049	Error message Promass; as a ASCII text (18 digits)	S18-String	RO	03	
2058	System failure Promass	16 Bit Int	RO	03	
2059	Pressure signal (from the 4-20 mA input)	Float	RO	03	
2061	Reserve				
2062	Printout modus 0 – 1 x each month 1 – 1 x each week 2 – daily at 12:00 3 – daily at 0:00 4 – each 12 hours 5 – each 6 hours	6 – each 4 hours 7 – each 2 hours 8 – each hour 9 – via key path at the Batching Master 10 - via a digital input	16 Bit Int	RO	03
2063	Print request from the Batching Master. Reset by the PCC	16 Bit Int	R/W	03, 06, 16	
2064	Status communication 0 - OK 1 - Time-Out 2 - CRC Error 3 - Format Error	16 Bit Int	RO	03	