

# Manual EMU Professional II M-Bus

Document Reference: 1480

Version: 2.1

Date: 27.06.2023

# Inhaltsverzeichnis

<b>1 General</b>	<b>4</b>
Settings ex Factory . . . . .	4
Connection Diagram M-Bus . . . . .	4
Configuration of the Primary Address on the Device . . . . .	4
Configuration of the Secondary Address on the Device . . . . .	5
Configuration of the Baud Rate on the Device . . . . .	5
Configuration via MB-Connect . . . . .	5
<b>2 Data Available for Read-Out</b>	<b>7</b>
Standard Energy Register Readout . . . . .	7
ViFE . . . . .	9
Request Set Time/Date Epoch with secondary address . . . . .	9
Answer Set Time/Date Epoch with secondary address . . . . .	10
Switching from 32bit to 64bit Registers . . . . .	10
Switching from 64bit to 32bit Registers . . . . .	10
Request Read Datalogger with secondary address . . . . .	11
Answer Read Datalogger with secondary address . . . . .	11
Definition of the Status-Codes . . . . .	13

Version	Revision Date	Token	Changes
V1.0	05.07.2021	met,fme	Creation of document
V1.1	07.12.2021	fme	Corrected M-Bus data logger answer (status byte VIFE)
V1.3	17.02.2022	met	Added missing M-Bus telegrams
V1.4	06.04.2022	met	Added information to data logger read-out
V1.5	05.05.2022	met	Additional info about time synchronization
V1.6	11.05.2022	met	Rework of Doc.Ref numbers. Same document in different language no longer has a different Doc.Ref number
V2.0	30.11.2022	met	Rework document structure
V2.1	26.06.2023	met	Switch between 32bit and 64bit register values

## General

The M-Bus interface is implemented according to EN 13757-2,-3 (formerly EN1434-3). Therefore the EMU Professional II M-Bus can communicate with all M-Bus capable devices. The M-Bus interface is integrated into the meter and protected from contamination and manipulation. The interface is located at the back of the meter on pin 1[3] (+) and pin 2[4] (-).

## Settings ex Factory

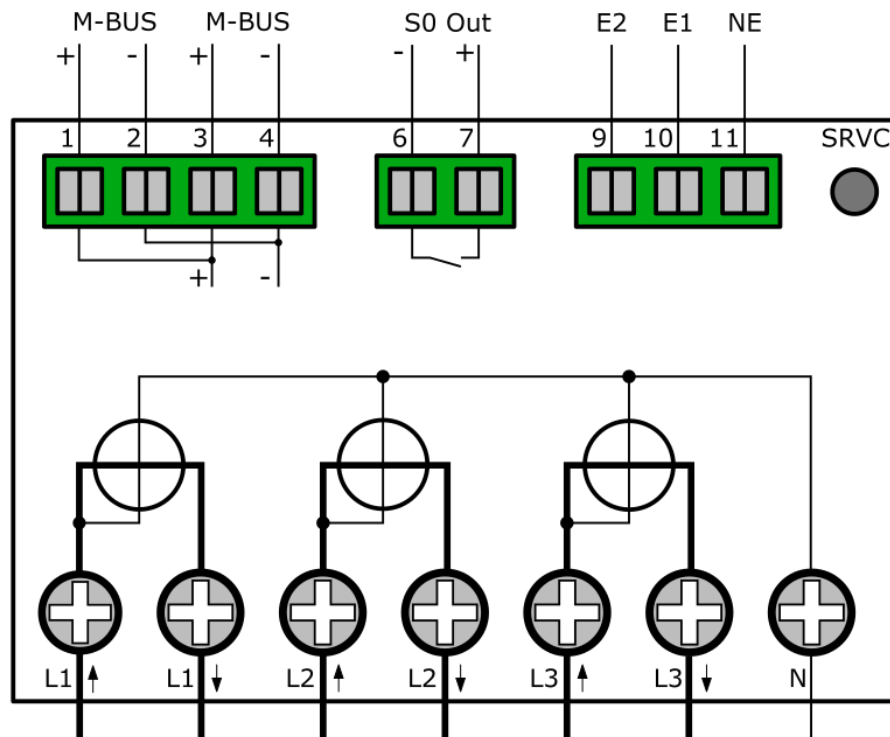
Setting	Value
Secondary Address	Serial number of the device
Primary Address	0
Baud rate	2400

## Connection Diagram M-Bus

The EMU Professional II M-Bus possesses two internally connected M-Bus clamps. This facilitates an easier serial connection of multiple M-Bus devices in installations.



*Note: The M-Bus interface is the same for the EMU Professional II 3/100 M-Bus and the EMU Professional II 3/5 M-Bus.*



## Configuration of the Primary Address on the Device

- “Arrow right” to settings
- “Arrow down” to M-Bus Pri. Address
- Press “SRVC” button (<2 seconds)
- “Arrow right” chooses the digit, “Arrow down” increments the digit
- Save: Press “SRVC” button (>2 seconds) until the LCD flashes

## Configuration of the Secondary Address on the Device

- “Arrow right” to settings
- “Arrow down” to M-Bus Sec. Address
- Press “SRVC” button (<2 seconds)
- “Arrow right” chooses the digit, “Arrow down” increments the digit
- Save: Press “SRVC” button (>2 seconds) until the LCD flashes

## Configuration of the Baud Rate on the Device

- “Arrow right” to settings
- “Arrow down” to M-Bus Baud Rate
- Press “SRVC” button (<2 seconds)
- “Arrow right” chooses between 300, 600, 1’200, 2’400 (default), 4’800 and 9’600 Baud
- Save: Press “SRVC” button (>2 seconds) until the LCD flashes

## Configuration via MB-Connect

The EMU Professional II M-Bus can also be configured over M-Bus with our own software MB-Connect.

Download the MB-Connect software [HERE](#) and start it up. Enter the following in the configuration window that pops up:

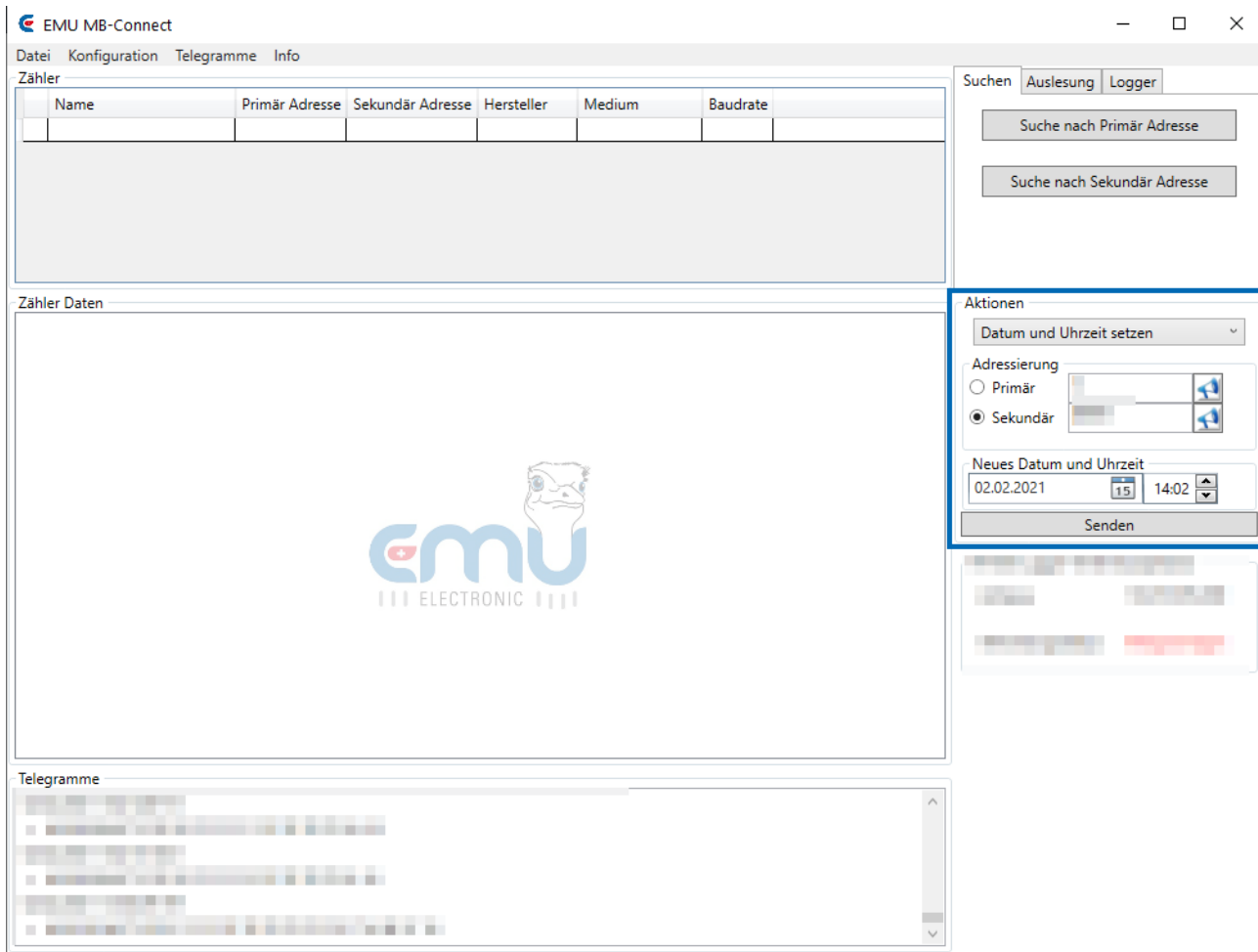


*Note: In case this window does not open up automatically you can open it manually by clicking on “Configuration” in the top menu.*

- “Communication mode”:
  - COM Port: Connect to the EMU Professional II via the COM-Port of your M-Bus level converter.
    - Choose which port you use.
    - Choose your desired baud rate.
    - If you initialize this EMU Professional II for the first time be sure to also check the last option “Initialize Device Prior to Read-Out (SND NKE)”.
    - Click “Save” and you should be connected to the meter.

Once you are connected to the EMU Professional II you can send commands via the action menu on the right.

- New Primary Address: Choose this option and set your desired address in the field “New Primary Address”.
  - “Save” this setting by clicking “Send” and delivering this information to the EMU Professional II .
- New Secondary Address: Choose this option and set your desired address in the field “New Secondary Address”.
  - “Save” this setting by clicking “Send” and delivering this information to the EMU Professional II .
- New Baud Rate: Choose this option and set your desired address in the field “New Baud Rate”.
  - “Save” this setting by clicking “Send” and delivering this information to the EMU Professional II .
- New Date/Time: Choose this option and set your desired address in the field “New Date/Time”.
  - “Save” this setting by clicking “Send” and delivering this information to the EMU Professional II .



For further information on the MB-Connect software please consult its documentation.

# Data Available for Read-Out

You can read out all registers of the EMU Professional II via M-Bus. The following chapters describe the M-Bus telegrams.

## Standard Energy Register Readout

Byte Nr.	Size	Value	Description	Meaning
1	1	0x68	START char LONG telegram	
2	1	0xBC	L-Field	
3	1	0xBC	L-Field repeated	
4	1	0x68	START char LONG telegram repeated	
5	1	0x08	C-Field	
6	1	0x00	A-Field primary address	
7	1	0x72	CI-Field 12 Byte header & variable format data	
8	4	...	Secondary address	
12	2	0x15	0xB5	Manufacturer Code EMU
14	1	0x19	Meter version 25	
15	1	0x02	Medium Electricity	
16	1	0xFF	Access Number	
17	1	0xFF	Status Byte	
18	2	0x00 0x00	Signature No Encryption	
20	1	0x84	DIF-Field 32 bit unsigned integer	Active Energy Import T1
21	1	0x10	DIFE-Field Tariff/Unit information	
22	1	0x03	VIF-Field Energy Wh	
23	4	...	Energy	
27	1	0x84	DIF-Field 32 bit unsigned integer	Active Energy Import T2
28	1	0x20	DIFE-Field Tariff/Unit information	
29	1	0x03	VIF-Field Energy Wh	
30	4	...	Energy	
34	1	0x84	DIF-Field 32 bit unsigned integer	Active Energy Export T1
35	1	0x10	DIFE-Field Tariff/Unit information	
36	1	0x03	VIF-Field Energy Wh	
37	4	...	Energy	
41	1	0x84	DIF-Field 32 bit unsigned integer	Active Energy Export T2
42	1	0x20	DIFE-Field Tariff/Unit information	
43	1	0x03	VIF-Field Energy Wh	
44	4	...	Energy	
48	1	0x84	DIF-Field 32 bit unsigned integer	Reactive Energy Import T1
49	1	0x90	DIFE-Field Tariff/Unit information	
50	1	0x40	DIFE-Field Tariff/Unit information	
51	1	0x03	VIF-Field Energy varh	
52	4	...	Energy	
56	1	0x84	DIF-Field 32 bit unsigned integer	Reactive Energy Import T2
57	1	0xA0	DIFE-Field Tariff/Unit information	
58	1	0x40	DIFE-Field Tariff/Unit information	
59	1	0x03	VIF-Field Energy varh	
60	4	...	Energy	
64	1	0x84	DIF-Field 32 bit unsigned integer	Reactive Energy Export T1
65	1	0x90	DIFE-Field Tariff/Unit information	
66	1	0x40	DIFE-Field Tariff/Unit information	
67	1	0x03	VIF-Field Energy varh	
68	4	...	Energy	
72	1	0x84	DIF-Field 32 bit unsigned integer	Reactive Energy Export T2
73	1	0xA0	DIFE-Field Tariff/Unit information	
74	1	0x40	DIFE-Field Tariff/Unit information	
75	1	0x03	VIF-Field Energy varh	

Byte Nr.	Size	Value	Description	Meaning
76	4	...	Energy	
80	1	0x04	DIF-Field 32 bit signed integer	Active Power L123
81	1	0x2B	VIF-Field Power W	
82	4	...	Power	
86	1	0x04	DIF-Field 32 bit signed integer	Active Power L1
87	1	0xAB	VIF-Field Power W	
88	1	0xFF	VIFE-Field Manufacturer specific	
89	1	0x01	VIFE-Field Phase L1	
90	4	...	Power	
94	1	0x04	DIF-Field 32 bit signed integer	Active Power L2
95	1	0xAB	VIF-Field Power W	
96	1	0xFF	VIFE-Field Manufacturer specific	
97	1	0x02	VIFE-Field Phase L2	
98	4	...	Power	
102	1	0x04	DIF-Field 32 bit signed integer	Active Power L3
103	1	0xAB	VIF-Field Power W	
104	1	0xFF	VIFE-Field Manufacturer specific	
105	1	0x03	VIFE-Field Phase L3	
106	4	...	Power	
110	1	0x04	DIF-Field 32 bit signed integer	Current L123
111	1	0xFD	VIF-Field Secondary VIF table	
112	1	0x59	VIFE-Field Current 0.001A	
113	4	...	Current	
117	1	0x04	DIF-Field 32 bit signed integer	Current L1
118	1	0xFD	VIF-Field Secondary VIF table	
119	1	0xD9	VIFE-Field Current 0.001A	
120	1	0xFF	VIFE-Field Manufacturer specific	
121	1	0x01	VIFE-Field Phase L1	
122	4	...	Current	
126	1	0x04	DIF-Field 32 bit signed integer	Current L2
127	1	0xFD	VIF-Field Extended VIF table	
128	1	0xD9	VIFE-Field Current 0.001A	
129	1	0xFF	VIFE-Field Manufacturer specific	
130	1	0x02	VIFE-Field Phase L2	
131	4	...	Current	
135	1	0x04	DIF-Field 32 bit signed integer	Current L3
136	1	0xFD	VIF-Field Extended VIF table	
137	1	0xD9	VIFE-Field Current 0.001A	
138	1	0xFF	VIFE-Field Manufacturer specific	
139	1	0x03	VIFE-Field Phase L3	
140	4	...	Current	
144	1	0x02	DIF-Field 16 bit signed integer	Voltage L1-N
145	1	0xFD	VIF-Field Extended VIF table	
146	1	0xC8	VIFE-Field Voltage 0.1V	
147	1	0xFF	VIFE-Field Manufacturer specific	
148	1	0x01	VIFE-Field Phase L1	
149	2	...	Voltage	
151	1	0x02	DIF-Field 16 bit signed integer	Voltage L2-N
152	1	0xFD	VIF-Field Extended VIF table	
153	1	0xC8	VIFE-Field Voltage 0.1V	
154	1	0xFF	VIFE-Field Manufacturer specific	
155	1	0x02	VIFE-Field Phase L2	
156	2	...	Voltage	
158	1	0x02	DIF-Field 16 bit signed integer	Voltage L3-N
159	1	0xFD	VIF-Field Extended VIF table	
160	1	0xC8	VIFE-Field Voltage 0.1V	
161	1	0xFF	VIFE-Field Manufacturer specific	
162	1	0x03	VIFE-Field Phase L3	



Byte Nr.	Size	Value	Description	Meaning
163	2	...	Voltage	
165	1	0x01	DIF-Field 8 bit signed integer	Powerfactor L1
166	1	0xFF	VIFE-Field Manufacturer specific	
167	1	0xE1	VIFE-Field Powerfactor	
168	1	0xFF	VIFE-Field Manufacturer specific	
169	1	0x01	VIFE-Field Phase L1	
170	1	...	Powerfactor	
171	1	0x01	DIF-Field 8 bit signed integer	Powerfactor L2
172	1	0xFF	VIFE-Field Manufacturer specific	
173	1	0xE1	VIFE-Field Powerfactor	
174	1	0xFF	VIFE-Field Manufacturer specific	
175	1	0x02	VIFE-Field Phase L2	
176	1	...	Powerfactor	
177	1	0x01	DIF-Field 8 bit signed integer	Powerfactor L3
178	1	0xFF	VIFE-Field Manufacturer specific	
179	1	0xE1	VIFE-Field Powerfactor	
180	1	0xFF	VIFE-Field Manufacturer specific	
181	1	0x03	VIFE-Field Phase L3	
182	1	...	Powerfactor	
183	1	0x02	DIF-Field 16 bit signed integer	Net Frequency L123
184	1	0xFF	VIF-Field Manufacturer specific	
185	1	0x52	VIFE-Field Net Frequency 0.1Hz	
186	2	...	Net Frequency	
188	1	0x02	DIF-Field 16 bit signed integer	Powerfail Count
189	1	0xFD	VIF-Field Extended VIF table	
190	1	0x60	VIFE-Field Powerfail (Reset) counter	
191	2	...	Powerfail Count	
193	1	0xFF	CS	
194	1	0x16	STOP char	

## ViFE

ViFE (bin)	ViFE (hex)	Description
0bX1010011	0x53	Index of datalogger entry
0bX1100010	0x62	Time 32Bit Epoch

## Request Set Time/Date Epoch with secondary address

Byte Nr.	Size	Value	Description
1	1	0x68	START char LONG telegram
2	1	0x12	L-Field
3	1	0x12	L-Field repeated
4	1	0x68	START char LONG telegram repeated
5	1	0x53 or 0x73	C-Field SND_UD (with or without FCB Bit)
6	1	0xFD	A-Field
7	1	0x51	CI-Field
8 – 15	8	...	Secondary address
16	1	0x04	DIF-Field
17	1	0xFF	VIF-Field manufacturer specific
18	1	0x62	VIFE-Field set time/date with 32Bit UNIX epoch
19 – 22	4	...	32Bit UNIX epoch
23	1	0xFF	CS
24	1	0x16	STOP char



Note: The time synchronization can be used as a broadcast transmission.

## Answer Set Time/Date Epoch with secondary address

Byte Nr.	Size	Value	Description
1	1	0xE5	ACK



Note: The LP variant of the EMU Professional II acknowledges a time synchronization only once every 15 minutes.

## Switching from 32bit to 64bit Registers

The following telegram switches the readout registers over M-bus from the default 32bit values to 64bit values. The FF in the middle are placeholders for the secondary address.

Byte Nr.	Size	Value	Description
1	1	0x68	START char LONG telegram
2	1	0x12	L-Field
3	1	0x12	L-Field repeated
4	1	0x68	START char LONG telegram repeated
5	1	0x53 or 0x73	C-Field SND_UD (with or without FCB Bit)
6	1	0xFD	A-Field
7	1	0x51	CI-Field
8 – 15	8	...	Secondary address
16	1	0x04	DIF-Field
17	1	0xFF	VIF-Field manufacturer specific
18	1	0x64	VIFE-Field Set M-Bus Telegram
19 – 22	4	01 00 00 00	Set 64bit flag
23	1	0xFF	CS
24	1	0x16	STOP char



Note: This telegram only works on meters with a serial number of 23260000 or greater.

## Switching from 64bit to 32bit Registers

The following telegram switches the readout registers over M-bus from 64bit values to the default 32bit values. The FF in the middle are placeholders for the secondary address.

Byte Nr.	Size	Value	Description
1	1	0x68	START char LONG telegram
2	1	0x12	L-Field
3	1	0x12	L-Field repeated
4	1	0x68	START char LONG telegram repeated
5	1	0x53 or 0x73	C-Field SND_UD (with or without FCB Bit)
6	1	0xFD	A-Field
7	1	0x51	CI-Field
8 – 15	8	...	Secondary address
16	1	0x04	DIF-Field
17	1	0xFF	VIF-Field manufacturer specific
18	1	0x64	VIFE-Field Set M-Bus Telegram

Byte Nr.	Size	Value	Description
19 – 22	4	00 00 00 00	Reset 64bit flag
23	1	0xXX	CS
24	1	0x16	STOP char



Note: This telegram only works on meters with a serial number of 23260000 or greater.

## Request Read Datalogger with secondary address

Byte Nr	Size	Value	Description
1	1	0x68	START char LONG telegram
2	1	0x12	L-Field
3	1	0x12	L-Field repeated
4	1	0x68	START char LONG telegram repeated
5	1	0x53 or 0x73	C-Field SND_UD (with or without FCB Bit)
6	1	0xFD	A-Field
7	1	0x51	CI-Field
8 – 15	8	...	Secondary address
16	1	0x04	DIF-Field
17	1	0xFF	VIF-Field manufacturer specific
18	1	0x50	VIFE-Field read datalogger by index
19 – 22	4	...	Index of required record (0x00000000 – 0x0019F7E; 0xFFFFFFFF or 0x0= latest record)
23	1	0xXX	CS
24	1	0x16	STOP char

## Answer Read Datalogger with secondary address

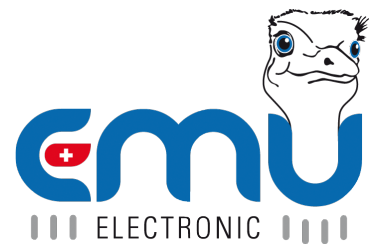
Byte Nr	Size	Value	Description	Information
1	1	0x68	START char LONG telegram	
2	1	0x7C	L-Field	
3	1	0x7C	L-Field repeated	
4	1	0x68	START char LONG telegram repeated	
5	1	0x08	C-Field	
6	1	0x00	A-Field primary address	
7	1	0x72	CI-Field 12 Byte header + format data	
8 – 11	4	...	Secondary Address	Secondary Address
12 – 13	2	0x15 0xB5	Manufacturer Code EMU	
14	1	0x16	Meter version 22	
15	1	0x02	Medium Electricity	
16	1	0xXX	Access Number	
17	1	0xXX	Status Byte	Status Byte
18 – 19	2	0x00 0x00	Signature No Encryption	
20	1	0x04	DIF-Field	
21	1	0xFF	VIF-Field manufacturer specific	
22	1	0x53	VIFE-Field Index of datalogger entry	
23 – 26	4	...	Data Logger Index (uint32)	Data Logger Index
27	1	0x01	DIF-Field	
28	1	0xFF	VIF-Field manufacturer specific	
29	1	0x54	VIFE-Field Statusbyte of datalogger entry	
30	1	...	Datalogger Status Byte (uint8)	
31	1	0x04	DIF-Field	

Byte Nr	Size	Value	Description	Information
32	1	0x6D	VIF-Field Date/Time TypeF	Timestamp
33 – 36	4	...	Timestamp TypeF	
37	1	0x87	DIF-Field 64 Bit Integer	
38	1	0x10	DIFE-Field Tariff/Unit information	
39	1	0x03	VIF-Field Wh	
40 – 47	8	...	Energy value (uint64)	Active Energy Import Tariff 1
48	1	0x87	DIF-Field 64 Bit Integer	
49	1	0x20	DIFE-Field Tariff/Unit information	
50	1	0x03	VIF-Field Wh	
51 – 58	8	...	Energy value (uint64)	Active Energy Import Tariff 2
59	1	0x87	DIF-Field 64 Bit Integer	
60	1	0x10	DIFE-Field Tariff/Unit information	
61	1	0x03	VIF-Field Wh	
62 – 69	8	...	Energy value (uint64)	Active Energy Export Tariff 1
70	1	0x87	DIF-Field 64 Bit Integer	
71	1	0x20	DIFE-Field Tariff/Unit information	
72	1	0x03	VIF-Field Wh	
73 – 80	8	...	Energy value (uint64)	Active Energy Export Tariff 1
81	1	0x87	DIF-Field 64 Bit Integer	
82	1	0x90	DIFE-Field Tariff/Unit information	
83	1	0x40	DIFE-Field Tariff/Unit information	
84	1	0x03	VIF-Field Wh	
85 – 92	8	...	Energy value (uint64)	Reactive Energy Import Tariff 1
93	1	0x87	DIF-Field 64 Bit Integer	
94	1	0xA0	DIFE-Field Tariff/Unit information	
95	1	0x40	DIFE-Field Tariff/Unit information	
96	1	0x03	VIF-Field Wh	
97 – 104	8	...	Energy value (uint64)	Reactive Energy Import Tariff 2
105	1	0x87	DIF-Field 64 Bit Integer	
106	1	0x90	DIFE-Field Tariff/Unit information	
107	1	0x40	DIFE-Field Tariff/Unit information	
108	1	0x03	VIF-Field Wh	
109 – 116	8	...	Energy value (uint64)	Reactive Energy Export Tariff 1
117	1	0x87	DIF-Field 64 Bit Integer	
118	1	0xA0	DIFE-Field Tariff/Unit information	
119	1	0x40	DIFE-Field Tariff/Unit information	
120	1	0x03	VIF-Field Wh	
121 – 128	8	...	Energy value (uint64)	Reactive Energy Export Tariff 2
129	1	0xFF	CS	
130	1	0x16	STOP char	

## Definition of the Status-Codes

The status code is bit-coded. The following table describes the status byte for binary, hex, and decimal read out.

Bit-Position	Bin	Hex	Dec	Description
0	0b00000000	0x0	0	No Change
0	0b00000001	0x1	1	Time changed
1	0b00000010	0x2	2	Current transformer ratio changed
2	0b00000100	0x4	4	Voltage transformer ratio changed
3	0b00001000	0x8	8	Impulse length changed
4	0b00010000	0x10	16	Impulse ratio changed
5	0b00100000	0x20	32	Power Failure
6	0b01000000	0x40	64	No time synchronization occurred
7	0b10000000	0x80	128	Logbook is full



**EMU Metering GmbH**

Friemarier Str. 38  
99867 Gotha  
Deutschland

Phone: +49 (0)3621 510 40 70

[hello@emu-metering.de](mailto:hello@emu-metering.de)  
[www.emu-metering.de](http://www.emu-metering.de)

**EMU Electronic AG**

Jöchlerweg 2  
CH-6340 Baar  
Switzerland

Phone: +41 (0)41 545 03 00

[helpdesk@emuag.ch](mailto:helpdesk@emuag.ch)  
[www.emuag.ch](http://www.emuag.ch)