

Manual EMU Professional II M-Bus

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Doc. Ref	Version	Revision Date	Token	Company	Changes
1481	V1.0	05.07.2021	met,fme	EMU Electronic AG	Creation of document
1481	V1.1	07.12.2021	fme	EMU Electronic AG	Corrected M-Bus data logger answer (status byte VIFE)
1481	V1.3	17.02.2022	met	EMU Electronic AG	Added missing M-Bus telegrams
1481	V1.4	06.04.2022	met	EMU Electronic AG	Added information to data logger read-out
1481	V1.5	05.05.2022	met	EMU Electronic AG	Additional info about time synchronization
1480	V1.6	11.05.2022	met	EMU Electronic AG	Rework of Doc.Ref numbers. Same document in different language no longer has a different Doc.Ref number

General

This document is a follow up for the EMU Professional II documentation (Doc.Ref 1451).

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

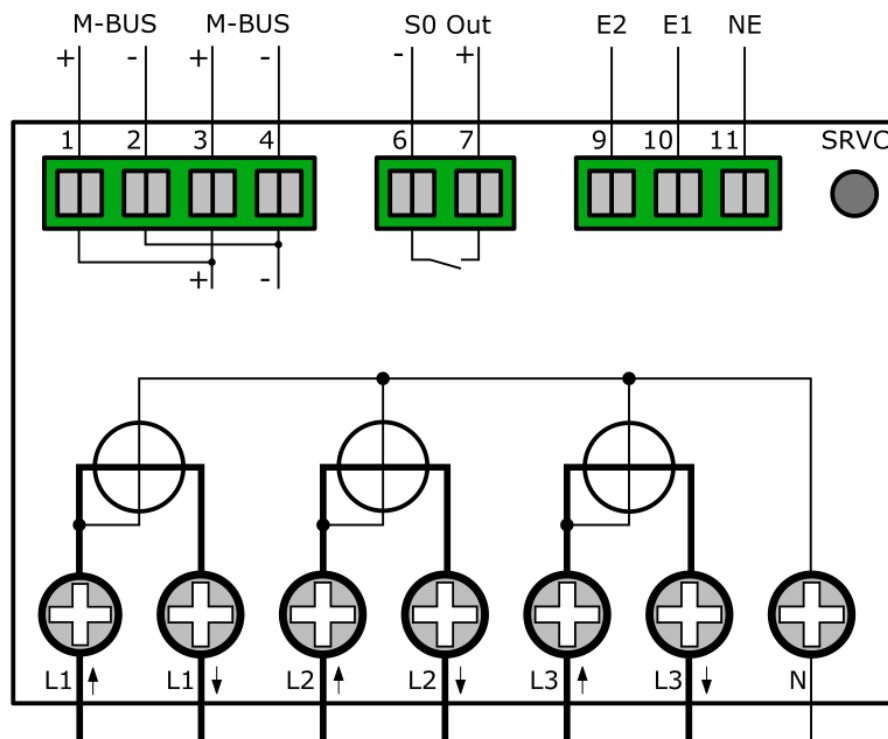
Setting	Value
Secondary Address	Serial number of the device
Primary Address	0
Baud rate	2400

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 while installing.



Note: The M-Bus interface is the same for the EMU Professional II 3/100 M-Bus and the EMU Professional 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 EMU M-Bus software [HERE](#) and start it up. Enter the following in the configuration window that pops up:

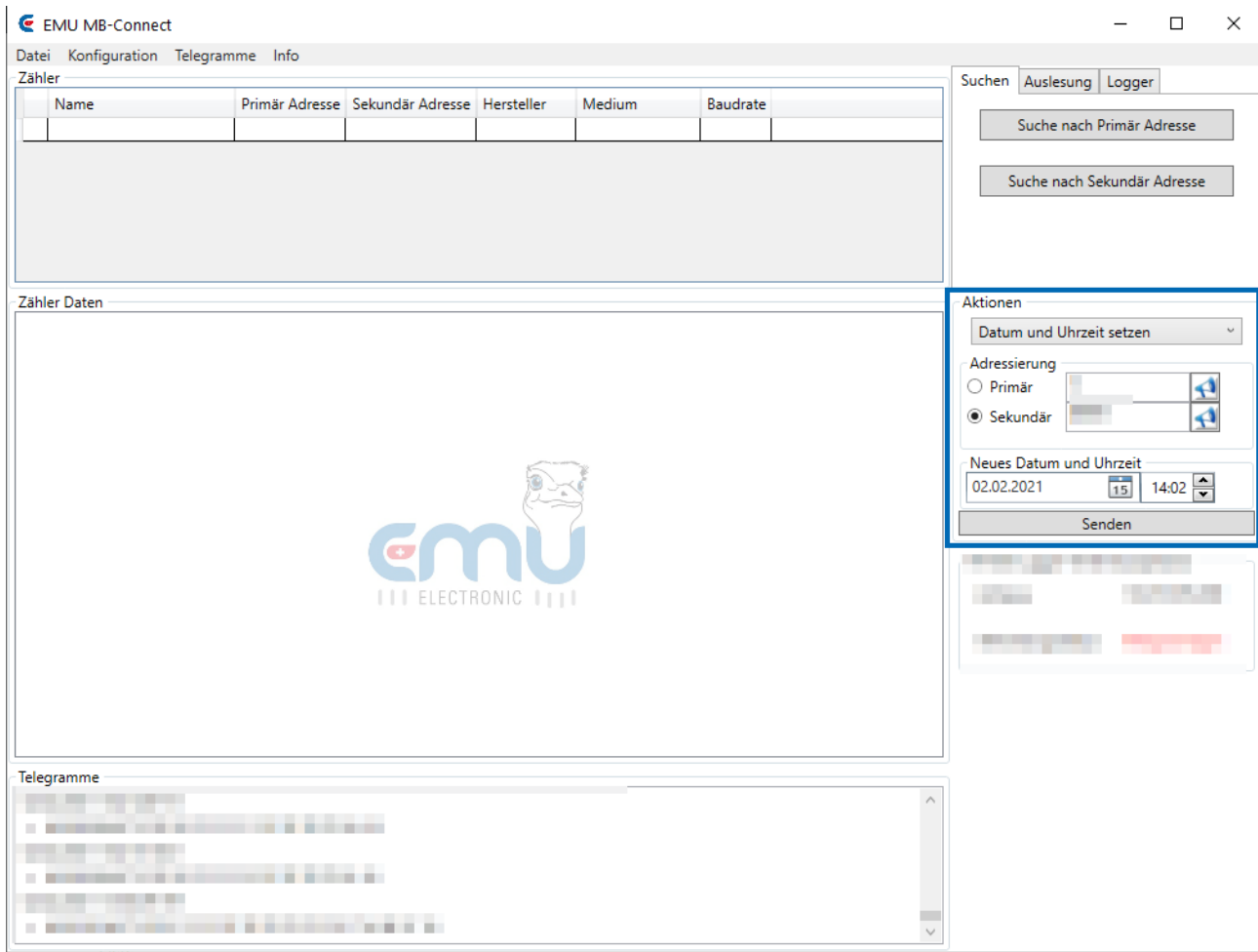


Note: In case this window does not open up automatically you can open it manually by clicking on “Configuration” in the top menu.

- “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.
- 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.
- 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.
- 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.



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

Data Available for Read-Out

You can read out all registers of the EMU Professionals 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.

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	0xFF	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	0xFF	Access Number	
17	1	0xFF	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

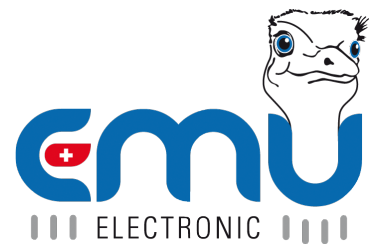
Byte Nr	Size	Value	Description	Information
27	1	0x01	DIF-Field	
28	1	0xFF	VIF-Field manufacturer specific	
29	1	0x54	VIFE-Field Statusbyte of datalogger entry	
30	1	...	Datalogger Status Byte (uint8)	
31	1	0x04	DIF-Field	
32	1	0x6D	VIF-Field Date/Time TypeF	Timestamp
33 – 36	4	...	Timestamp TypeF	
37	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

Bit-Position	Bin	Hex	Dec	Description
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



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