

Manual EMU Professional II Modbus

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Version	Revision Date	Token	Changes
V1.0	23.03.2021	met	Creation of Document
V1.1	04.04.2021	met, mro	Matching of unit and resolution
V1.2	04.05.2022	fbo,sha	Matching of unit and resolution
V1.3	10.05.2022	fbo	Sort order changed
V1.4	11.05.2022	met	Rework of Doc.Ref numbers. Same document in different language no longer has a different Doc.Ref number
V1.5	03.08.2022	fbo	Added new min/max registers, fixed unit/value of datalogger
V1.6	01.09.2022	met, fbo	fixed modpoll examples
V2.0	30.11.2022	met	Rework of document structure
V2.1	14.04.2023	met	Added register 5026 as writable
V2.2	21.06.2023	met	Description of Modbus Test Registers
V2.3	12.07.2023	met	slave address change explanation

General

All registers available for Modbus read-out are listed in this document. The registers are read-only. The function code is <<Read Holding Registers - 03>>. In case you are integrating the EMU Professional II into an existing EMU Professional / Allrounder Modbus installation you can find the old register no. in the chapter "EMU Professional Compatible Read-Out"

You can find a few examples of Modbus read-out with modpoll at the end of this document.



Note: This document assumes 1 as the starting point for the registers. If your Modbus client starts its read out at register 0 a subtraction of 1 is needed for all register numbers in this document.

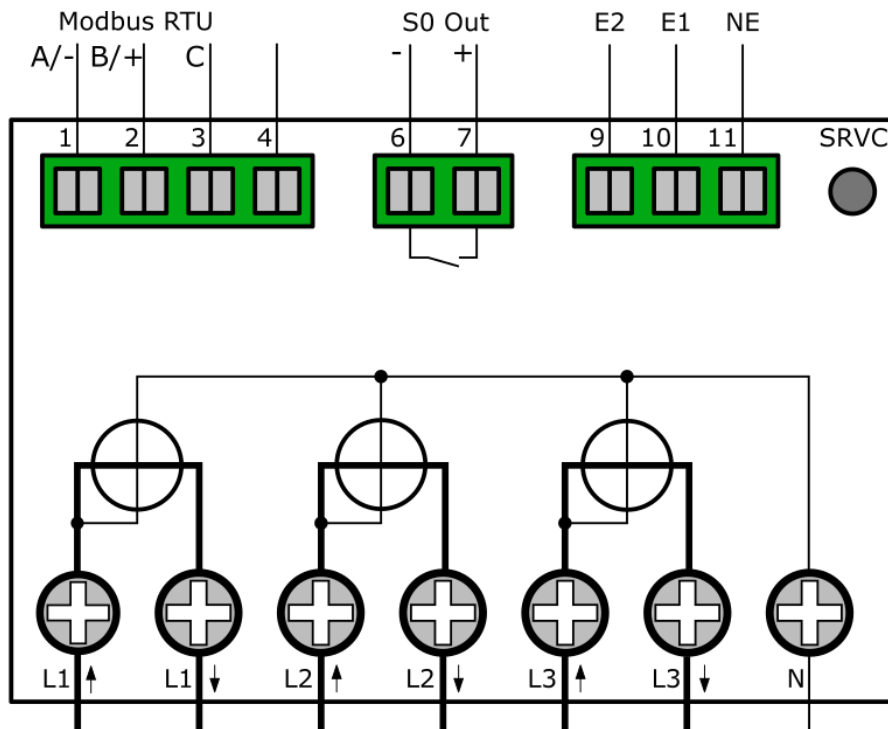
Settings ex Factory

Setting	Value
Slave Address	1
Baud rate	19200
Parity	even
Stop Bits	1
Data Bits	8

Connection Diagram Modbus



Note: The Modbus interface is the same for both the EMU Professional II 3/100 Modbus and the EMU Professional II 3/5 Modbus.



Configuration of the Slave Address on the Device

- “Arrow right” to settings
- “Arrow down” to ModBus Slave Adr.
- 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

Data Types

Description	Data Type	Value Facet	No. of Register
Integer, 16bit, signed	sInt16	-32'768 .. 32'767	1
Integer, 32bit, unsigned	uInt32	0 .. 4'294'967'295	2
float, 32bit, single precision	float	-3.4 * 10 ³⁸ .. 3.4 * 10 ³⁸	2
Integer, 64bit, unsigned	uInt64	0 .. 18'446'744'073'709'551'615	4

Modbus Test Registers

The following registers may be used to controll the modbus read out. The values in these registers are constant. If your readout values differ from these, please check the following readout settings:

- Endianness
- Command (output register data type)
- Multiple register for one value (64bit values require 4 registers)

Description	Register	Data Type	Expected
Unsigned Int 32bit	4000	uInt32	4032260735
Unsigned Int 32bit Minimum	4002	uInt32	0
Unsigned Int 32bit Maximum	4004	uInt32	4042260735
Signed Int 32bit	4006	sInt32	-42260735
Signed Int 32bit Minimum	4008	sInt32	-2147483648
Signed Int 32bit Maximum	4010	sInt32	2147483647
Unsigned Int 64bit	4012	uInt64	17361393123323912609
Unsigned Int 64bit Minimum	4016	uInt64	0
Unsigned Int 64bit Maximum	4020	uInt64	18446744073709551615
Signed Int 64bit	4024	sInt64	1220492058828054945
Signed Int 64bit Minimum	4028	sInt64	-9223372036854775808
Signed Int 64bit Maximum	4032	sInt64	9223372036854775807
Signed Float32	4036	float	1.234567
Signed Float32	4038	float	8/2.01
Signed Float32	4040	float	-1234567.89
Signed Float32	4040	float	1.26999998092651
Signed Float32	4040	float	0
Signed Float32	4040	float	-1.27999997138977
Signed Float32	4040	float	2.54999995231628
Signed Float32	4040	float	0
Signed Float32	4040	float	1.23000001907348
Signed Float32	4040	float	2.53999996185302

Read-Out of Meter Information

Description	Register	Data Type
Serial No.	5000	uint32
Factory No.	5002	uint32
Current System-time	5026	uint64

Definitions

This document uses both Active Energy Consumption and Active Energy Import. These notations are synonyms. The same applies to:

Active Energy Production and Active Energy Export

Reactive Energy Import and Reactive Energy Capacitive

Reactive Energy Export and Reactive Energy Inductive and Reactive.

Read-Out of Data logger

The data logger saves energy and power values at the end of the load profile interval. While the current log interval is not completed (e.g. 15 minute load profile interval) the values in these Registers are those of the previous load profile. After a startup of the meter these registers will send the value "0" until the first load profile after startup is completed.

Description	Unit	Resolution	Register	Data Type
Time Stamp of Entry	Epoch	Seconds	5900	uint32
Active Energy Import L123 T1	Wh	1 Wh	5902	uint64
Active Energy Import L123 T2	Wh	1 Wh	5906	uint64
Active Energy Export L123 T1	Wh	1 Wh	5910	uint64
Active Energy Export L123 T2	Wh	1 Wh	5914	uint64
Reactive Energy Import L123 T1	varh	1 varh	5918	uint64
Reactive Energy Import L123 T2	varh	1 varh	5922	uint64
Reactive Energy Export L123 T1	varh	1 varh	5926	uint64
Reactive Energy Export L123 T2	varh	1 varh	5930	uint64
Active Power L123	W	1 W	5934	float
Active Power L1	W	1 W	5936	float
Active Power L2	W	1 W	5938	float
Active Power L3	W	1 W	5940	float
Current L123	A	0.001 A	5942	float
Current L1	A	0.001 A	5944	float
Current L2	A	0.001 A	5946	float
Current L3	A	0.001 A	5948	float
Current L4	A	0.001 A	5950	float
Voltage L1-N	V	0.1 V	5952	float
Voltage L2-N	V	0.1 V	5954	float
Voltage L3-N	V	0.1 V	5956	float
Power Factor L1	-	0.01	5958	float
Power Factor L2	-	0.01	5960	float
Power Factor L3	-	0.01	5962	float
Frequency	Hz	0.1 Hz	5964	float

Register Read-Out EMU Professional II

Energy Register 64bit, Wh/varh Resolution

Active Energy

Description	Unit	Resolution	Register	Data Type
Phase L123				
Active Energy Import L123 Total	Wh	1 Wh	6000	uInt64
Active Energy Import L123 T1	Wh	1 Wh	6004	uInt64
Active Energy Import L123 T2	Wh	1 Wh	6008	uInt64
Active Energy Import L123 T3	Wh	1 Wh	6012	uInt64
Active Energy Import L123 T4	Wh	1 Wh	6016	uInt64
Active Energy Export L123 Total	Wh	1 Wh	6020	uInt64
Active Energy Export L123 T1	Wh	1 Wh	6024	uInt64
Active Energy Export L123 T2	Wh	1 Wh	6028	uInt64
Active Energy Export L123 T3	Wh	1 Wh	6032	uInt64
Active Energy Export L123 T4	Wh	1 Wh	6036	uInt64
Phase L1				
Active Energy Import L1 Total	Wh	1 Wh	6100	uInt64
Active Energy Import L1 T1	Wh	1 Wh	6104	uInt64
Active Energy Import L1 T2	Wh	1 Wh	6108	uInt64
Active Energy Import L1 T3	Wh	1 Wh	6112	uInt64
Active Energy Import L1 T4	Wh	1 Wh	6116	uInt64
Active Energy Export L1 Total	Wh	1 Wh	6120	uInt64
Active Energy Export L1 T1	Wh	1 Wh	6124	uInt64
Active Energy Export L1 T2	Wh	1 Wh	6128	uInt64
Active Energy Export L1 T3	Wh	1 Wh	6132	uInt64
Active Energy Export L1 T4	Wh	1 Wh	6136	uInt64
Phase L2				
Active Energy Import L2 Total	Wh	1 Wh	6140	uInt64
Active Energy Import L2 T1	Wh	1 Wh	6144	uInt64
Active Energy Import L2 T2	Wh	1 Wh	6148	uInt64
Active Energy Import L2 T3	Wh	1 Wh	6152	uInt64
Active Energy Import L2 T4	Wh	1 Wh	6156	uInt64
Active Energy Export L2 Total	Wh	1 Wh	6160	uInt64
Active Energy Export L2 T1	Wh	1 Wh	6164	uInt64
Active Energy Export L2 T2	Wh	1 Wh	6168	uInt64
Active Energy Export L2 T3	Wh	1 Wh	6172	uInt64
Active Energy Export L2 T4	Wh	1 Wh	6176	uInt64
Phase L3				
Active Energy Import L3 Total	Wh	1 Wh	6180	uInt64
Active Energy Import L3 T1	Wh	1 Wh	6184	uInt64
Active Energy Import L3 T2	Wh	1 Wh	6188	uInt64
Active Energy Import L3 T3	Wh	1 Wh	6192	uInt64
Active Energy Import L3 T4	Wh	1 Wh	6196	uInt64
Active Energy Export L3 Total	Wh	1 Wh	6200	uInt64
Active Energy Export L3 T1	Wh	1 Wh	6204	uInt64
Active Energy Export L3 T2	Wh	1 Wh	6208	uInt64
Active Energy Export L3 T3	Wh	1 Wh	6212	uInt64
Active Energy Export L3 T4	Wh	1 Wh	6216	uInt64

Reactive Energy

Description	Unit	Resolution	Register	Data Type
Phase L123				
Reactive Energy Import L123 Total	varh	1 varh	6300	uInt64
Reactive Energy Import L123 T1	varh	1 varh	6304	uInt64
Reactive Energy Import L123 T2	varh	1 varh	6308	uInt64
Reactive Energy Import L123 T3	varh	1 varh	6312	uInt64
Reactive Energy Import L123 T4	varh	1 varh	6316	uInt64
Reactive Energy Export L123 Total	varh	1 varh	6320	uInt64
Reactive Energy Export L123 T1	varh	1 varh	6324	uInt64
Reactive Energy Export L123 T2	varh	1 varh	6328	uInt64
Reactive Energy Export L123 T3	varh	1 varh	6332	uInt64
Reactive Energy Export L123 T4	varh	1 varh	6336	uInt64
Phase L1				
Reactive Energy Import L1 Total	varh	1 varh	6400	uInt64
Reactive Energy Import L1 T1	varh	1 varh	6404	uInt64
Reactive Energy Import L1 T2	varh	1 varh	6408	uInt64
Reactive Energy Import L1 T3	varh	1 varh	6412	uInt64
Reactive Energy Import L1 T4	varh	1 varh	6416	uInt64
Reactive Energy Export L1 Total	varh	1 varh	6420	uInt64
Reactive Energy Export L1 T1	varh	1 varh	6424	uInt64
Reactive Energy Export L1 T2	varh	1 varh	6428	uInt64
Reactive Energy Export L1 T3	varh	1 varh	6432	uInt64
Reactive Energy Export L1 T4	varh	1 varh	6436	uInt64
Phase L2				
Reactive Energy Import L2 Total	varh	1 varh	6440	uInt64
Reactive Energy Import L2 T1	varh	1 varh	6444	uInt64
Reactive Energy Import L2 T2	varh	1 varh	6448	uInt64
Reactive Energy Import L2 T3	varh	1 varh	6452	uInt64
Reactive Energy Import L2 T4	varh	1 varh	6456	uInt64
Reactive Energy Export L2 Total	varh	1 varh	6460	uInt64
Reactive Energy Export L2 T1	varh	1 varh	6464	uInt64
Reactive Energy Export L2 T2	varh	1 varh	6468	uInt64
Reactive Energy Export L2 T3	varh	1 varh	6472	uInt64
Reactive Energy Export L2 T4	varh	1 varh	6476	uInt64
Phase L3				
Reactive Energy Import L3 Total	varh	1 varh	6480	uInt64
Reactive Energy Import L3 T1	varh	1 varh	6484	uInt64
Reactive Energy Import L3 T2	varh	1 varh	6488	uInt64
Reactive Energy Import L3 T3	varh	1 varh	6492	uInt64
Reactive Energy Import L3 T4	varh	1 varh	6496	uInt64
Reactive Energy Export L3 Total	varh	1 varh	6500	uInt64
Reactive Energy Export L3 T1	varh	1 varh	6504	uInt64
Reactive Energy Export L3 T2	varh	1 varh	6508	uInt64
Reactive Energy Export L3 T3	varh	1 varh	6512	uInt64
Reactive Energy Export L3 T4	varh	1 varh	6516	uInt64

Energy Register 64bit, kWh/kvarh Resolution

Active Energy

Description	Unit	Resolution	Register	Data Type
Phase L123				
Active Energy Import L123 Total	kWh	1 kWh	7000	uInt64
Active Energy Import L123 T1	kWh	1 kWh	7004	uInt64
Active Energy Import L123 T2	kWh	1 kWh	7008	uInt64
Active Energy Import L123 T3	kWh	1 kWh	7012	uInt64
Active Energy Import L123 T4	kWh	1 kWh	7016	uInt64
Active Energy Export L123 Total	kWh	1 kWh	7020	uInt64
Active Energy Export L123 T1	kWh	1 kWh	7024	uInt64
Active Energy Export L123 T2	kWh	1 kWh	7028	uInt64
Active Energy Export L123 T3	kWh	1 kWh	7032	uInt64
Active Energy Export L123 T4	kWh	1 kWh	7036	uInt64
Phase L1				
Active Energy Import L1 Total	kWh	1 kWh	7100	uInt64
Active Energy Import L1 T1	kWh	1 kWh	7104	uInt64
Active Energy Import L1 T2	kWh	1 kWh	7108	uInt64
Active Energy Import L1 T3	kWh	1 kWh	7112	uInt64
Active Energy Import L1 T4	kWh	1 kWh	7116	uInt64
Active Energy Export L1 Total	kWh	1 kWh	7120	uInt64
Active Energy Export L1 T1	kWh	1 kWh	7124	uInt64
Active Energy Export L1 T2	kWh	1 kWh	7128	uInt64
Active Energy Export L1 T3	kWh	1 kWh	7132	uInt64
Active Energy Export L1 T4	kWh	1 kWh	7136	uInt64
Phase L2				
Active Energy Import L2 Total	kWh	1 kWh	7140	uInt64
Active Energy Import L2 T1	kWh	1 kWh	7144	uInt64
Active Energy Import L2 T3	kWh	1 kWh	7152	uInt64
Active Energy Import L2 T2	kWh	1 kWh	7148	uInt64
Active Energy Import L2 T4	kWh	1 kWh	7156	uInt64
Active Energy Export L2 Total	kWh	1 kWh	7160	uInt64
Active Energy Export L2 T1	kWh	1 kWh	7164	uInt64
Active Energy Export L2 T2	kWh	1 kWh	7168	uInt64
Active Energy Export L2 T3	kWh	1 kWh	7172	uInt64
Active Energy Export L2 T4	kWh	1 kWh	7176	uInt64
Phase L3				
Active Energy Import L3 Total	kWh	1 kWh	7180	uInt64
Active Energy Import L3 T1	kWh	1 kWh	7184	uInt64
Active Energy Import L3 T2	kWh	1 kWh	7188	uInt64
Active Energy Import L3 T3	kWh	1 kWh	7192	uInt64
Active Energy Import L3 T4	kWh	1 kWh	7196	uInt64
Active Energy Export L3 Total	kWh	1 kWh	7200	uInt64
Active Energy Export L3 T1	kWh	1 kWh	7204	uInt64
Active Energy Export L3 T2	kWh	1 kWh	7208	uInt64
Active Energy Export L3 T3	kWh	1 kWh	7212	uInt64
Active Energy Export L3 T4	kWh	1 kWh	7216	uInt64

Reactive Energy

Description	Unit	Resolution	Register	Data Type
Phase L123				
Reactive Energy Import L123 Total	kvarh	1 kvarh	7300	uint64
Reactive Energy Import L123 T1	kvarh	1 kvarh	7304	uint64
Reactive Energy Import L123 T2	kvarh	1 kvarh	7308	uint64
Reactive Energy Import L123 T3	kvarh	1 kvarh	7312	uint64
Reactive Energy Import L123 T4	kvarh	1 kvarh	7316	uint64
Reactive Energy Export L123 Total	kvarh	1 kvarh	7320	uint64
Reactive Energy Export L123 T1	kvarh	1 kvarh	7324	uint64
Reactive Energy Export L123 T2	kvarh	1 kvarh	7328	uint64
Reactive Energy Export L123 T3	kvarh	1 kvarh	7332	uint64
Reactive Energy Export L123 T4	kvarh	1 kvarh	7336	uint64
Phase L1				
Reactive Energy Import L1 Total	kvarh	1 kvarh	7340	uint64
Reactive Energy Import L1 T1	kvarh	1 kvarh	7344	uint64
Reactive Energy Import L1 T2	kvarh	1 kvarh	7348	uint64
Reactive Energy Import L1 T3	kvarh	1 kvarh	7352	uint64
Reactive Energy Import L1 T4	kvarh	1 kvarh	7356	uint64
Reactive Energy Export L1 Total	kvarh	1 kvarh	7360	uint64
Reactive Energy Export L1 T1	kvarh	1 kvarh	7364	uint64
Reactive Energy Export L1 T2	kvarh	1 kvarh	7368	uint64
Reactive Energy Export L1 T3	kvarh	1 kvarh	7372	uint64
Reactive Energy Export L1 T4	kvarh	1 kvarh	7376	uint64
Phase L2				
Reactive Energy Import L2 Total	kvarh	1 kvarh	7380	uint64
Reactive Energy Import L2 T1	kvarh	1 kvarh	7384	uint64
Reactive Energy Import L2 T2	kvarh	1 kvarh	7388	uint64
Reactive Energy Import L2 T3	kvarh	1 kvarh	7392	uint64
Reactive Energy Import L2 T4	kvarh	1 kvarh	7396	uint64
Reactive Energy Export L2 Total	kvarh	1 kvarh	7400	uint64
Reactive Energy Export L2 T1	kvarh	1 kvarh	7404	uint64
Reactive Energy Export L2 T2	kvarh	1 kvarh	7408	uint64
Reactive Energy Export L2 T3	kvarh	1 kvarh	7412	uint64
Reactive Energy Export L2 T4	kvarh	1 kvarh	7416	uint64
Phase L3				
Reactive Energy Import L3 Total	kvarh	1 kvarh	7420	uint64
Reactive Energy Import L3 T1	kvarh	1 kvarh	7424	uint64
Reactive Energy Import L3 T2	kvarh	1 kvarh	7428	uint64
Reactive Energy Import L3 T3	kvarh	1 kvarh	7432	uint64
Reactive Energy Import L3 T4	kvarh	1 kvarh	7436	uint64
Reactive Energy Export L3 Total	kvarh	1 kvarh	7440	uint64
Reactive Energy Export L3 T1	kvarh	1 kvarh	7444	uint64
Reactive Energy Export L3 T2	kvarh	1 kvarh	7448	uint64
Reactive Energy Export L3 T3	kvarh	1 kvarh	7452	uint64
Reactive Energy Export L3 T4	kvarh	1 kvarh	7456	uint64

Energy Register 32bit, kWh/kvarh Resolution

Active Energy

Description	Unit	Resolution	Register	Data Type
Phase L123				
Active Energy Import L123 Total	kWh	1 kWh	8000	uInt32
Active Energy Import L123 T1	kWh	1 kWh	8002	uInt32
Active Energy Import L123 T2	kWh	1 kWh	8004	uInt32
Active Energy Import L123 T3	kWh	1 kWh	8006	uInt32
Active Energy Import L123 T4	kWh	1 kWh	8008	uInt32
Active Energy Export L123 Total	kWh	1 kWh	8010	uInt32
Active Energy Export L123 T1	kWh	1 kWh	8012	uInt32
Active Energy Export L123 T2	kWh	1 kWh	8014	uInt32
Active Energy Export L123 T3	kWh	1 kWh	8016	uInt32
Active Energy Export L123 T4	kWh	1 kWh	8018	uInt32
Phase L1				
Active Energy Import L1 Total	kWh	1 kWh	8100	uInt32
Active Energy Import L1 T1	kWh	1 kWh	8102	uInt32
Active Energy Import L1 T2	kWh	1 kWh	8104	uInt32
Active Energy Import L1 T3	kWh	1 kWh	8106	uInt32
Active Energy Import L1 T4	kWh	1 kWh	8108	uInt32
Active Energy Export L1 Total	kWh	1 kWh	8110	uInt32
Active Energy Export L1 T1	kWh	1 kWh	8112	uInt32
Active Energy Export L1 T2	kWh	1 kWh	8114	uInt32
Active Energy Export L1 T3	kWh	1 kWh	8116	uInt32
Active Energy Export L1 T4	kWh	1 kWh	8118	uInt32
Phase L2				
Active Energy Import L2 Total	kWh	1 kWh	8120	uInt32
Active Energy Import L2 T1	kWh	1 kWh	8122	uInt32
Active Energy Import L2 T2	kWh	1 kWh	8124	uInt32
Active Energy Import L2 T3	kWh	1 kWh	8126	uInt32
Active Energy Import L2 T4	kWh	1 kWh	8128	uInt32
Active Energy Export L2 Total	kWh	1 kWh	8130	uInt32
Active Energy Export L2 T1	kWh	1 kWh	8132	uInt32
Active Energy Export L2 T2	kWh	1 kWh	8134	uInt32
Active Energy Export L2 T3	kWh	1 kWh	8136	uInt32
Active Energy Export L2 T4	kWh	1 kWh	8138	uInt32
Phase L3				
Active Energy Import L3 Total	kWh	1 kWh	8140	uInt32
Active Energy Import L3 T1	kWh	1 kWh	8142	uInt32
Active Energy Import L3 T2	kWh	1 kWh	8144	uInt32
Active Energy Import L3 T3	kWh	1 kWh	8146	uInt32
Active Energy Import L3 T4	kWh	1 kWh	8148	uInt32
Active Energy Export L3 Total	kWh	1 kWh	8150	uInt32
Active Energy Export L3 T1	kWh	1 kWh	8152	uInt32
Active Energy Export L3 T2	kWh	1 kWh	8154	uInt32
Active Energy Export L3 T3	kWh	1 kWh	8156	uInt32
Active Energy Export L3 T4	kWh	1 kWh	8158	uInt32

Reactive Energy

Description	Unit	Resolution	Register	Data Type
Phase L123				
Reactive Energy Import L123 Total	kvarh	1 kvarh	8200	ulnt32
Reactive Energy Import L123 T1	kvarh	1 kvarh	8202	ulnt32
Reactive Energy Import L123 T2	kvarh	1 kvarh	8204	ulnt32
Reactive Energy Import L123 T3	kvarh	1 kvarh	8206	ulnt32
Reactive Energy Import L123 T4	kvarh	1 kvarh	8208	ulnt32
Reactive Energy Export L123 Total	kvarh	1 kvarh	8210	ulnt32
Reactive Energy Export L123 T1	kvarh	1 kvarh	8212	ulnt32
Reactive Energy Export L123 T2	kvarh	1 kvarh	8214	ulnt32
Reactive Energy Export L123 T3	kvarh	1 kvarh	8216	ulnt32
Reactive Energy Export L123 T4	kvarh	1 kvarh	8218	ulnt32
Phase L1				
Reactive Energy Import L1 Total	kvarh	1 kvarh	8300	ulnt32
Reactive Energy Import L1 T1	kvarh	1 kvarh	8302	ulnt32
Reactive Energy Import L1 T2	kvarh	1 kvarh	8304	ulnt32
Reactive Energy Import L1 T3	kvarh	1 kvarh	8306	ulnt32
Reactive Energy Import L1 T4	kvarh	1 kvarh	8308	ulnt32
Reactive Energy Export L1 Total	kvarh	1 kvarh	8310	ulnt32
Reactive Energy Export L1 T1	kvarh	1 kvarh	8312	ulnt32
Reactive Energy Export L1 T2	kvarh	1 kvarh	8314	ulnt32
Reactive Energy Export L1 T3	kvarh	1 kvarh	8316	ulnt32
Reactive Energy Export L1 T4	kvarh	1 kvarh	8318	ulnt32
Phase L2				
Reactive Energy Import L2 Total	kvarh	1 kvarh	8320	ulnt32
Reactive Energy Import L2 T1	kvarh	1 kvarh	8322	ulnt32
Reactive Energy Import L2 T2	kvarh	1 kvarh	8324	ulnt32
Reactive Energy Import L2 T3	kvarh	1 kvarh	8326	ulnt32
Reactive Energy Import L2 T4	kvarh	1 kvarh	8328	ulnt32
Reactive Energy Export L2 Total	kvarh	1 kvarh	8330	ulnt32
Reactive Energy Export L2 T1	kvarh	1 kvarh	8332	ulnt32
Reactive Energy Export L2 T2	kvarh	1 kvarh	8334	ulnt32
Reactive Energy Export L2 T3	kvarh	1 kvarh	8336	ulnt32
Reactive Energy Export L2 T4	kvarh	1 kvarh	8338	ulnt32
Phase L3				
Reactive Energy Import L3 Total	kvarh	1 kvarh	8340	ulnt32
Reactive Energy Import L3 T1	kvarh	1 kvarh	8342	ulnt32
Reactive Energy Import L3 T2	kvarh	1 kvarh	8344	ulnt32
Reactive Energy Import L3 T3	kvarh	1 kvarh	8346	ulnt32
Reactive Energy Import L3 T4	kvarh	1 kvarh	8348	ulnt32
Reactive Energy Export L3 Total	kvarh	1 kvarh	8350	ulnt32
Reactive Energy Export L3 T1	kvarh	1 kvarh	8352	ulnt32
Reactive Energy Export L3 T2	kvarh	1 kvarh	8354	ulnt32
Reactive Energy Export L3 T3	kvarh	1 kvarh	8356	ulnt32
Reactive Energy Export L3 T4	kvarh	1 kvarh	8358	ulnt32

Momentary Values

Power

Description	Unit	Resolution	Register	Data Type
Active Power L123	W	1 W	9000	float
Active Power L1	W	1 W	9002	float
Active Power L2	W	1 W	9004	float
Active Power L3	W	1 W	9006	float
Reactive Power L123	var	1 var	9010	float
Reactive Power L1	var	1 var	9012	float
Reactive Power L2	var	1 var	9014	float
Reactive Power L3	var	1 var	9016	float
Apparent Power L123	VA	1 VA	9020	float
Apparent Power L1	VA	1 VA	9022	float
Apparent Power L2	VA	1 VA	9024	float
Apparent Power L3	VA	1 VA	9026	float

Current

Description	Unit	Resolution	Register	Data Type
Current L123	A	1 A	9100	float
Current L1	A	1 A	9102	float
Current L2	A	1 A	9104	float
Current L3	A	1 A	9106	float

Voltage

Description	Unit	Resolution	Register	Data Type
Voltage L1-N	V	0.1 V	9200	float
Voltage L2-N	V	0.1 V	9202	float
Voltage L3-N	V	0.1 V	9204	float
Voltage L1-L2	V	0.1 V	9206	float
Voltage L2-L3	V	0.1 V	9208	float
Voltage L3-L1	V	0.1 V	9210	float

Power Factor and Frequency

Description	Unit	Resolution	Register	Data Type
Power Factor L1	-	1	9300	float
Power Factor L2	-	1	9302	float
Power Factor L3	-	1	9304	float
Frequency	Hz	1 Hz	9310	float

Minimum and Maximum Values



Note: These values are only available to meters with a serial number greater than 22350000.

Voltage

Description	Unit	Resolution	Register	Data Type
Min. Voltage L1-N	V	0.1 V	10000	float
Min. Voltage L2-N	V	0.1 V	10002	float
Min. Voltage L3-N	V	0.1 V	10004	float
Min. Voltage L1-N Timestamp	Epoch	Seconds	10008	uint64
Min. Voltage L2-N Timestamp	Epoch	Seconds	10012	uint64
Min. Voltage L2-N Timestamp	Epoch	Seconds	10016	uint64
Max. Voltage L1-N	V	0.1 V	10024	float
Max. Voltage L2-N	V	0.1 V	10026	float
Max. Voltage L3-N	V	0.1 V	10028	float
Max. Voltage L1-N Timestamp	Epoch	Seconds	10032	uint64
Max. Voltage L2-N Timestamp	Epoch	Seconds	10036	uint64
Max. Voltage L3-N Timestamp	Epoch	Seconds	10040	uint64

Current

Description	Unit	Resolution	Register	Data Type
Min. Current L1	A	0.001 A	10100	float
Min. Current L2	A	0.001 A	10102	float
Min. Current L3	A	0.001 A	10104	float
Min. Current L123	A	0.001 A	10106	float
Min. Current L1 Timestamp	Epoch	Seconds	10108	uint64
Min. Current L2 Timestamp	Epoch	Seconds	10112	uint64
Min. Current L3 Timestamp	Epoch	Seconds	10116	uint64
Min. Current L123 Timestamp	Epoch	Seconds	10120	uint64
Max. Current L1	A	0.001 A	10124	float
Max. Current L2	A	0.001 A	10126	float
Max. Current L3	A	0.001 A	10128	float
Max. Current L123	A	0.001 A	10130	float
Max. Current L1 Timestamp	Epoch	Seconds	10132	uint64
Max. Current L2 Timestamp	Epoch	Seconds	10136	uint64
Max. Current L3 Timestamp	Epoch	Seconds	10140	uint64
Max. Current L123 Timestamp	Epoch	Seconds	10144	uint64

Power

Description	Unit	Resolution	Register	Data Type
Max. Active Energy L1	W	1 W	10200	float
Max. Active Energy L2	W	1 W	10202	float
Max. Active Energy L3	W	1 W	10204	float
Max. Active Energy L123	W	1 W	10206	float
Max. Active Energy L1 Timestamp	Epoch	Seconds	10208	uint64
Max. Active Energy L2 Timestamp	Epoch	Seconds	10212	uint64
Max. Active Energy L3 Timestamp	Epoch	Seconds	10216	uint64
Max. Active Energy L123 Timestamp	Epoch	Seconds	10220	uint64
Max. Reactive Energy L1	var	1 var	10300	float

Description	Unit	Resolution	Register	Data Type
Max. Reactive Energy L2	var	1 var	10302	float
Max. Reactive Energy L3	var	1 var	10304	float
Max. Reactive Energy L123	var	1 var	10306	float
Max. Reactive Energy L1 Timestamp	Epoch	Seconds	10308	ulnt64
Max. Reactive Energy L2 Timestamp	Epoch	Seconds	10312	ulnt64
Max. Reactive Energy L3 Timestamp	Epoch	Seconds	10316	ulnt64
Max. Reactive Energy L123 Timestamp	Epoch	Seconds	10320	ulnt64
Max. Apparent Energy L1	VA	1 VA	10400	float
Max. Apparent Energy L2	VA	1 VA	10402	float
Max. Apparent Energy L3	VA	1 VA	10404	float
Max. Apparent Energy L123	VA	1 VA	10406	float
Max. Apparent Energy L1 Timestamp	Epoch	Seconds	10408	ulnt64
Max. Apparent Energy L2 Timestamp	Epoch	Seconds	10412	ulnt64
Max. Apparent Energy L3 Timestamp	Epoch	Seconds	10416	ulnt64
Max. Apparent Energy L123 Timestamp	Epoch	Seconds	10420	ulnt64
Min. Active Energy L1	W	1 W	10500	float
Min. Active Energy L2	W	1 W	10502	float
Min. Active Energy L3	W	1 W	10504	float
Min. Active Energy L123	W	1 W	10506	float
Min. Active Energy L1 Timestamp	Epoch	Seconds	10508	ulnt64
Min. Active Energy L2 Timestamp	Epoch	Seconds	10512	ulnt64
Min. Active Energy L3 Timestamp	Epoch	Seconds	10516	ulnt64
Min. Active Energy L123 Timestamp	Epoch	Seconds	10520	ulnt64
Min. Reactive Energy L1	var	1 var	10600	float
Min. Reactive Energy L2	var	1 var	10602	float
Min. Reactive Energy L3	var	1 var	10604	float
Min. Reactive Energy L123	var	1 var	10606	float
Min. Reactive Energy L1 Timestamp	Epoch	Seconds	10608	ulnt64
Min. Reactive Energy L2 Timestamp	Epoch	Seconds	10612	ulnt64
Min. Reactive Energy L3 Timestamp	Epoch	Seconds	10616	ulnt64
Min. Reactive Energy L123 Timestamp	Epoch	Seconds	10620	ulnt64
Min. Apparent Energy L1	VA	1 VA	10700	float
Min. Apparent Energy L2	VA	1 VA	10702	float
Min. Apparent Energy L3	VA	1 VA	10704	float
Min. Apparent Energy L123	VA	1 VA	10706	float
Min. Apparent Energy L1 Timestamp	Epoch	Seconds	10708	ulnt64
Min. Apparent Energy L2 Timestamp	Epoch	Seconds	10712	ulnt64
Min. Apparent Energy L3 Timestamp	Epoch	Seconds	10716	ulnt64
Min. Apparent Energy L123 Timestamp	Epoch	Seconds	10720	ulnt64

Power Factor and Frequency

Description	Unit	Resolution	Register	Data Type
Min. Power Factor L1	-	1	10900	float
Min. Power Factor L2	-	1	10902	float
Min. Power Factor L3	-	1	10904	float
Min. Power Factor L1 Timestamp	Epoch	Seconds	10906	ulnt64
Min. Power Factor L2 Timestamp	Epoch	Seconds	10910	ulnt64
Min. Power Factor L3 Timestamp	Epoch	Seconds	10914	ulnt64
Max. Power Factor L1	-	1	10918	float
Max. Power Factor L2	-	1	10920	float
Max. Power Factor L3	-	1	10922	float
Max. Power Factor L1 Timestamp	Epoch	Seconds	10924	ulnt64
Max. Power Factor L2 Timestamp	Epoch	Seconds	10928	ulnt64
Max. Power Factor L3 Timestamp	Epoch	Seconds	10932	ulnt64
Min. Frequency	Hz	0.1 Hz	10950	float

Description	Unit	Resolution	Register	Data Type
Min. Frequency Timestamp	Epoch	Seconds	10952	uInt64
Max. Frequency	Hz	0.1 Hz	10956	float
Max. Frequency Timestamp	Epoch	Seconds	10958	uInt64

Further Information



Note: These values are only available to meters with a serial number greater than 22350000.

Description	Register	Data Type
Powerfail count on meter	11000	uInt16
Current Tariff	11001	uInt16
Current transformer ratio primary	11002	uInt16
Current transformer ratio secondary	11003	uInt16
Voltage transformer ratio primary	11004	uInt16
Voltage transformer ratio secondary	11005	uInt16

Further Functionality

To reset the Min/Max-Registers, change the current tariff or set the system time, the following registers can be written to.

Writing to these registers requires the function code <<Write Multiple Registers - 16>>.

Description	Register	Data Type
Switching of tariff	11001	uInt16
Reset of Min/Max Registers	11006	uInt16
Current System-time	5026	uInt64

To change the current tariff please write the desired tariff (1,2,3,4) into the register 11001.

To reset the min/max registers please write a 1 into the register 11006.

To set the current system-time please write the time as a 64-bit EPOCH value to the register 5026.



Note: Switching of the current tariff is only possible on the EMU Professional II Modbus (RTU) meters with a serial number greater than 22350000. Furthermore the meter must be produced with the function "Tariff switching via Interface".

Examples for Modbus Read-Out

These Examples use Modpoll to read-out the registers.

Please make sure you entered the correct IP address of your meter.

More information on Modpoll command arguments can be found at <https://www.modbusdriver.com/modpoll.html>.

Energy Register

Active Energy Import Tariff 1 Total:

```
modpoll.exe -l -m tcp -t 4:int -i -f -r 5902 -c 1 10.255.255.119
```

Active Energy Export Phase L1 Tariff 2:

```
modpoll.exe -l -m tcp -t 4:int -i -f -r 6128 -c 1 10.255.255.119
```

Reactive Energy Export Total:

```
modpoll.exe -l -m tcp -t 4:int -i -f -r 7320 -c 1 10.255.255.119
```

Momentary Values

Active Power Total:

```
modpoll.exe -l -m tcp -t 4:float -i -f -r 9000 -c 1 10.255.255.119
```

Apparent Power Phase L3:

```
modpoll.exe -l -m tcp -t 4:float -i -f -r 9026 -c 1 10.255.255.119
```

Power Factor Phase L1:

```
modpoll.exe -l -m tcp -t 4:float -i -f -r 9300 -c 1 10.255.255.119
```

Voltage L1-N:

```
modpoll.exe -l -m tcp -t 4:float -i -f -r 9200 -c 1 10.255.255.119
```

Information for Read-Out to a Loxone Miniserver

Be aware, that contrary to the EMU Professional/Allrounder, the EMU Professional II uses unsigned integers/floats. Registers with 2 and 4 registers used (32bit, 64bit respectively) need their register order reversed.

TCP/IP

Example 32-bit Value:

Active Energy Import Total	
Register	8000
Command	3 – Read holding register(4x)
Datatype	32-bit unsigned integer
16-Bit Register	yes
Register order	yes
Byte order	no
Start value 1	0
End value 1	0
Start value 2	100
End value 2	100
Unit	kWh

Einstellungen	
<input type="checkbox"/> Fehlerausgang anzeig...	
IO-Adresse	7999
Befehl	3 - Read holding register(...
Datentyp	32-bit unsigned integer
<input checked="" type="checkbox"/> 16-Bit Register	
<input checked="" type="checkbox"/> Registerreihenfolge	
<input type="checkbox"/> Byte-Reihenfolge	
Abfragezyklus [s]	5
Korrektur	
Eingangswert 1	0
Zielwert 1	0
Eingangswert 2	100
Zielwert 2	100
Logging/Mail/Call/Track	
Validierung	
<input type="checkbox"/> Validierung verwenden	
<input checked="" type="checkbox"/> Validierung überwach...	
Zeitüberschreitung Empf...	25
Standardwert	0
Empfindlichkeit	
Anzeige	
Einheit	<V>kWh
Simulation/LiveView	

Example 64-bit Value:

Active Energy Import Total	
Register	6000
Command	3 – Read holding register(4x)
Datatype	64-bit unsigned integer
16-Bit Register	yes
Register order	yes
Byte order	no
Start value 1	0
End value 1	0
Start value 2	10
End value 2	10
Unit	Wh

Einstellungen

Fehlerausgang anzeig...

IO-Adresse

Befehl

Datentyp

16-Bit Register

Registerreihenfolge

Byte-Reihenfolge

Abfragezyklus [s]

Korrektur

Eingangswert 1

Zielwert 1

Eingangswert 2

Zielwert 2

Logging/Mail/Call/Track

Validierung

Empfindlichkeit

Anzeige

Einheit

RTU

Example 32-bit Value:

Active Energy Import Total	
Register	8000
Command	3 – Read holding register(4x)
Datatype	32-bit unsigned integer
16-Bit Register	yes
Register order	no
Byte order	no
Start value 1	0
End value 1	0
Start value 2	100
End value 2	100
Unit	kWh

Einstellungen	
<input type="checkbox"/> Fehlerausgang anzeig...	
IO-Adresse	7999
Befehl	3 - Read holding register(...
Datentyp	32-bit unsigned integer
<input checked="" type="checkbox"/> 16-Bit Register	
<input type="checkbox"/> Registerreihenfolge	
<input type="checkbox"/> Byte-Reihenfolge	
Abfragezyklus [s]	60
Korrektur	
Eingangswert 1	0
Zielwert 1	0
Eingangswert 2	100
Zielwert 2	100
Logging/Mail/Call/Track	
Validierung	
Empfindlichkeit	
Anzeige	
Einheit	<v>kWh

EMU Professional TCP Compatible Read-Out



Note: The EMU Professional II works with unsigned data types while the EMU Professional/Allrounder works with signed data types.

Energy Register

Description	Unit	Resolution	Register	Data Type
32 bit				
Active Energy Consumption Total	Wh	1 Wh	4631	uInt32
Active Energy Consumption Tariff 1	Wh	1 Wh	4633	uInt32
Active Energy Consumption Tariff 2	Wh	1 Wh	4635	uInt32
Active Energy Supply Total	Wh	1 Wh	4637	uInt32
Active Energy Supply Tariff 1	Wh	1 Wh	4639	uInt32
Active Energy Supply Tariff 2	Wh	1 Wh	4641	uInt32
Inductive Reactive Energy Total	varh	1 varh	4643	uInt32
Inductive Reactive Energy Tariff 1	varh	1 varh	4645	uInt32
Inductive Reactive Energy Tariff 2	varh	1 varh	4647	uInt32
Capacitive Reactive Energy Total	varh	1 varh	4649	uInt32
Capacitive Reactive Energy Tariff 1	varh	1 varh	4651	uInt32
Capacitive Reactive Energy Tariff 2	varh	1 varh	4653	uInt32
32 bit				
Active Energy Consumption Total	Wh	1 Wh	4202	uInt64
Active Energy Consumption Tariff 1	Wh	1 Wh	4230	uInt64
Active Energy Consumption Tariff 2	Wh	1 Wh	4246	uInt64
Active Energy Supply Total	Wh	1 Wh	4282	uInt64
Active Energy Supply Tariff 1	Wh	1 Wh	4310	uInt64
Active Energy Supply Tariff 2	Wh	1 Wh	4326	uInt64
Inductive Reactive Energy Total	varh	1 varh	4362	uInt64
Inductive Reactive Energy Tariff 1	varh	1 varh	4390	uInt64
Inductive Reactive Energy Tariff 2	varh	1 varh	4406	uInt64
Capacitive Reactive Energy Total	varh	1 varh	4442	uInt64
Capacitive Reactive Energy Tariff 1	varh	1 varh	4470	uInt64
Capacitive Reactive Energy Tariff 2	varh	1 varh	4486	uInt64

Power

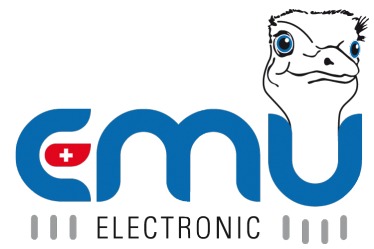
Description	Unit	Resolution	Register	Data Type
Active Power L123	W	1 W	4528	sInt32
Active Power L1	W	1 W	4522	sInt32
Active Power L2	W	1 W	4524	sInt32
Active Power L3	W	1 W	4526	sInt32
Reactive Power L123	var	1 var	4536	sInt32
Reactive Power L1	var	1 var	4530	sInt32
Reactive Power L2	var	1 var	4532	sInt32
Reactive Power L3	var	1 var	4534	sInt32
Apparent Power L123	VA	1 VA	4544	sInt32
Apparent Power L1	VA	1 VA	4538	sInt32
Apparent Power L2	VA	1 VA	4540	sInt32
Apparent Power L3	VA	1 VA	4542	sInt32

Current and Voltage

Description	Unit	Resolution	Register	Data Type
Current L123	mA	1 mA	4598	sInt32
Current L1	mA	1 mA	4592	sInt32
Current L2	mA	1 mA	4594	sInt32
Current L3	mA	1 mA	4596	sInt32
Voltage L1-N	0.1 V	0.1 V	4568	sInt16
Voltage L2-N	0.1 V	0.1 V	4569	sInt16
Voltage L3-N	0.1 V	0.1 V	4570	sInt16
Voltage L1-L2	0.1 V	0.1 V	4571	sInt16
Voltage L2-L3	0.1 V	0.1 V	4572	sInt16
Voltage L3-L1	0.1 V	0.1 V	4573	sInt16

Power Factor and Frequency

Description	Unit	Resolution	Register	Data Type
Power Factor L1	-	0.01	4624	float
Power Factor L2	-	0.01	4625	float
Power Factor L3	-	0.01	4626	float
Frequency	0.1Hz	0.1 Hz	4627	float



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