

UEM2L, UEM4L <UEM2L-A R, UEM4L-A R>

Multi-load three phase energy meter with built-in communication

- UEM2L-A R; UEM4L-A R with RS485 Modbus RTU communication
- Compatible with the EMCT three-phase CT block series
- CT blocks rated current varies according to the block model
- Two models based on load numbers:
 - UEM2L-A R: 2 three-phase channels
 - UEM4L-A R: 4 three-phase channels (equivalent to two or four independent three-phase meters)
- MID certified, class B according to EN 50470-3
- Maximum operating temperature of 70°C



» General features

The UEM2L-A R and UEM4L-A R are high-performance multi-circuit energy meters designed for monitoring multiple loads in both industrial and commercial environments. Housed in a compact 4-DIN module format, these devices offer advanced functionality by enabling the simultaneous measurement of two or four independent three-phase loads, effectively replacing multiple traditional meters with a single, integrated solution.

The device comes with MID certification, making it suitable for billing purposes.

The active energy is compliant to EN 50470-3 class B (MID), the reactive energy is compliant to IEC/EN 62053-23 class 2.

The meters are specifically designed to operate in conjunction with the EMCT series of three-phase current transformer blocks. This configuration allows accurate current measurement across four available ranges: 160 A, 250 A, 630 A, 1000 A.

Besides the energy, the meter can measure the main electrical parameters and makes them available also on the built-in COM port. The COM port allows to manage the connected meter by a remote station. Data is transmitted on a RS485 line. Moreover, a dedicated application for remote management is provided:

- *Modbus Master software* > for energy meter set up & monitoring by PC in RS485 network.

Metrological LED on front panel and sealable terminal covers. The analysis of the MTBF values, the accurate selection of components and the reduction of the internal working temperatures together with strict production and control standards guarantee a product with an excellent quality and a long lasting reliability.

» Applications

- Energy monitoring of multiple machines or production lines within industrial plants.
- Measurement of energy generated by renewable sources such as solar, eolic, etc.
- Energy tracking and billing in residential compounds, campgrounds, and marinas
- Submetering in multi-tenant commercial buildings, shopping centers, and office complexes.
- Load profiling and cost allocation in data centers and IT facilities.
- Integration into energy management systems (EMS) for centralized supervision and cost optimization.
- Remote survey of the consumptions and compute of the costs.

» Benefits

- Remote management (RS485 Modbus).
- Up to 50 real-time electrical measurements.
- Compact design and simplified wiring reduce installation time & space.
- Monitor up to four independent 3-phase loads with a single device.
- Significant cost savings compared to traditional CT-based systems.
- MID certified.
- Operating temperature up to 70°C.

» Related products

- Algodue's EMCT three phase CT Blocks
- Modbus Master software (for Windows OS)

» Measurements

	3.4.3	3.3.2	1.2.1
REAL TIME VALUES			
Phase 1 to Neutral Voltage (U1N)	•		•
Phase 2 to Neutral Voltage (U2N)	•		
Phase 3 to Neutral Voltage (U3N)	•		
Line 1 to 2 Voltage (V12)	•	•	
Line 2 to 3 Voltage (V23)	•	•	
Line 3 to 1 Voltage (V31)	•	•	
Phase Sequence	•	•	
Phase 1 Current (I1)*	•	•	•
Phase 2 Current (I2)*	•	•	
Phase 3 Current (I3)*	•	•	
Neutral Current (IN)*	•		
System Frequency (F)	•	•	•
Phase 1 Power Factor (PF1)*	•		•
Phase 2 Power Factor (PF2)*	•		
Phase 3 Power Factor (PF3)*	•		
System Power Factor (PF Σ)	•	•	
Phase 1 Active Power (P1)*	•		•
Phase 2 Active Power (P2)*	•		
Phase 3 Active Power (P3)*	•		
System Active Power (P Σ)*	•	•	
Phase 1 Apparent Power (S1)*	•		•
Phase 2 Apparent Power (S2)*	•		
Phase 3 Apparent Power (S3)*	•		
System Apparent Power (S Σ)*	•	•	
Phase 1 Reactive Power (Q1)*	•		•
Phase 2 Reactive Power (Q2)*	•		
Phase 3 Reactive Power (Q3)*	•		
System Reactive Power (Q Σ)*	•	•	
Phase 1 to Neutral Voltage THD (U1N THD)	•		•
Phase 2 to Neutral Voltage THD (U2N THD)	•		
Phase 3 to Neutral Voltage THD (U3N THD)	•		
Line 1 to 2 Voltage THD (V12 THD)		•	
Line 2 to 3 Voltage THD (V23 THD)		•	
Phase 1 Current THD (I1 THD)*	•	•	•
Phase 2 Current THD (I2 THD)*	•		
Phase 3 Current THD (I3 THD)*	•	•	
Phase 1 Current Maximum Demand (I1 MAX DMD)*	•	•	•
Phase 2 Current Maximum Demand (I2 MAX DMD)*	•	•	
Phase 3 Current Maximum Demand (I3 MAX DMD)*	•	•	
System Active Power Maximum Demand ($\pm$ P Σ MAX DMD)*	•	•	•

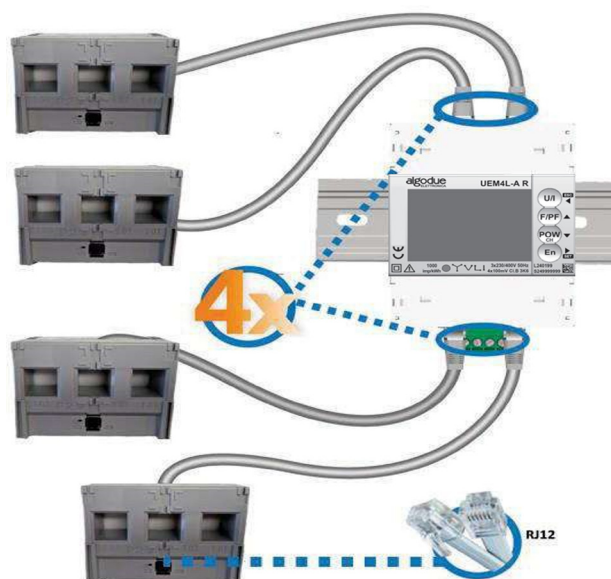
NOTE: The display parameters related to currents, powers, power factor, THD & MAX DMD(*)— are available x2 or x4 (depending on the model).

» Measurements

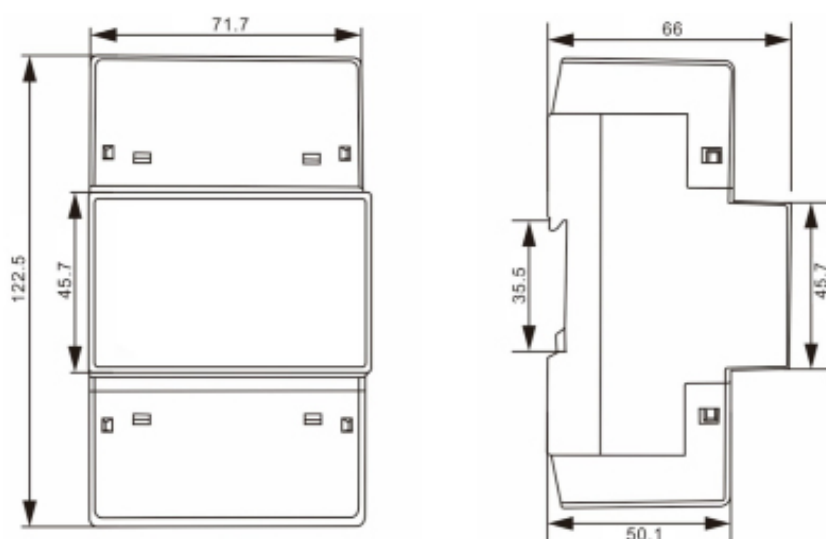
	3.4.3	3.3.2	1.2.1	TOTAL COUNTERS	PARTIAL COUNTERS
ENERGY COUNTERS					
Phase 1 Imported Active Energy (+kWh1)*	•		•	•	
Phase 2 Imported Active Energy (+kWh2)*	•			•	
Phase 3 Imported Active Energy (+kWh3)*	•			•	
System Imported Active Energy (+kWh Σ)*	•	•		•	•
Phase 1 Exported Active Energy (-kWh1)*	•		•	•	
Phase 2 Exported Active Energy (-kWh2)*	•			•	
Phase 3 Exported Active Energy (-kWh3)*	•			•	
System Exported Active Energy (-kWh Σ)*	•	•		•	•
System Apparent Energy (kVAh Σ)*	•	•	•	•	•
Phase 1 Imported Reactive Energy (+kvarh1)*	•		•	•	
Phase 2 Imported Reactive Energy (+kvarh2)*	•			•	
Phase 3 Imported Reactive Energy (+kvarh3)*	•			•	
System Imported Reactive Energy (+kvarh Σ)*	•	•		•	•
Phase 1 Exported Reactive Energy (-kvarh1)*	•		•	•	
Phase 2 Exported Reactive Energy (-kvarh2)*	•			•	
Phase 3 Exported Reactive Energy (-kvarh3)*	•			•	
System Exported Reactive Energy (-kvarh Σ)*	•	•		•	•
Balance of System Active Energy [imp-exp] (kWh Σ BAL)*	•	•	•	•	
Balance of System Reactive Energy [imp-exp] (kvarh Σ BAL)*	•	•	•	•	

NOTE: The display parameters related to energies (*) – are available x2 or x4 (depending on the model).

» Installation



» Technical drawing (mm)



» Technical features

GENERAL	
Housing in compliance with	DIN 43880

AUXILIARY POWER SUPPLY	
Voltage	100 ... 277 VAC
Max consumption	1 W, 3 VA
Wiring modes (x2/x4 channels)	3ph/ 4 wires/ 3 currents,
	3ph/ 3 wires/ 2 currents,
	1ph/ 2 wires/ 1 current

VOLTAGE	
Nominal value	3x230/400 V 50/60 Hz

CURRENT	
CT primary rating per block type:	160A 250A 630 A 1000A
Starting current I_{st}	0.24 A 0.4 A 1 A 1.6 A
Minimum current I_{min}	1.2 A 2 A 5 A 8 A
Transitional current I_{tr}	6 A 10 A 25 A 4 A
Nominal current I_n	120 A 200 A 500 A 800 A
Maximum current I_{max}	160 A 250 A 630 A 1000 A

ACCURACY	
Active energy class B in compliance with	EN 50470-3
Reactive energy class 2 in compliance with	EN 62053-23

COMMUNICATION	
Isolated port	RS485
Unit load	1/2
Protocol	MODBUS RTU
Communication speed	24/48/96/192/384 kbps

SAFETY	
In compliance with	IEC 62052-11, IEC 62052-31
Pollution degree	2
Protective class	II
Pulse voltage withstand	6 kV-1.2 μ s
AC voltage withstand	4 kV for 1 min
Housing material flame resistance	UL 94 class V0

ENVIRONMENTAL CONDITIONS	
Mechanical environmental	M1
Electromagnetic environmental	E2
Operating temperature	-40°C ... +70°C
Storage temperature	-40°C ... +75°C
Humidity (without condensation)	max 95%
Protection degree of frontal panel/ terminals	IP51 / IP20
Installation	Internal use

EMCT ‹EMCT-160, EMCT-250, EMCT630, EMCT1000›
CT blocks for three-phase systems

- Measure all loads up to 1000 A with just 4 references
- Class 1 for the overall measurement chain (energy meter + EMCT-XX three-phase CT blocks)
- Accuracy of measurement according to IEC 61557-12 standard
- Flexible mounting: sensors can be mounting in either direction
- Backplate, bus bar or DIN-rail mounting
- Quick connection via RJ12 cable for error-free connection

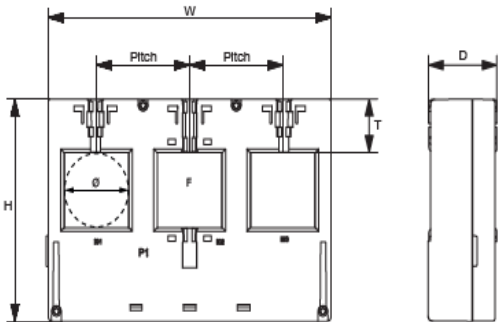


Selection guide

Four distinct configurations are available, each tailored to a specific nominal and maximum current range. These variants differ in size and weight, offering flexible options to meet diverse installation and performance requirements.

ELECTRICAL FEATURES	EMCT-160	EMCT-250	EMCT-630	EMCT-1000
Nominal current range In	40 ... 160 A	63 ... 250 A	160 ... 630 A	400 ... 1000 A
Actual coverage range	0.8 ... 192 A	1.26 ... 300 A	3.2 ... 756 A	8 ... 1200 A
Max. current	192 A	300 A	756 A	1200 A
Weight	150 g	200 g	350 g	500 g
Max. voltage (phase/neutral)	600 V			
Rated withstand voltage	3.6 kV / 1min			
Frequency	50/60 Hz			
Measurement category	CAT III			
Protection degree	IP30 / IK06			
Operating temperature	-10 ... +70 °C			
Storage temperature	-25 ... +85°C			
Relative humidity	95% RH condensation-free			
Altitude	< 2000 m			
Connection	RJ12 cable			

Dimensions (mm)

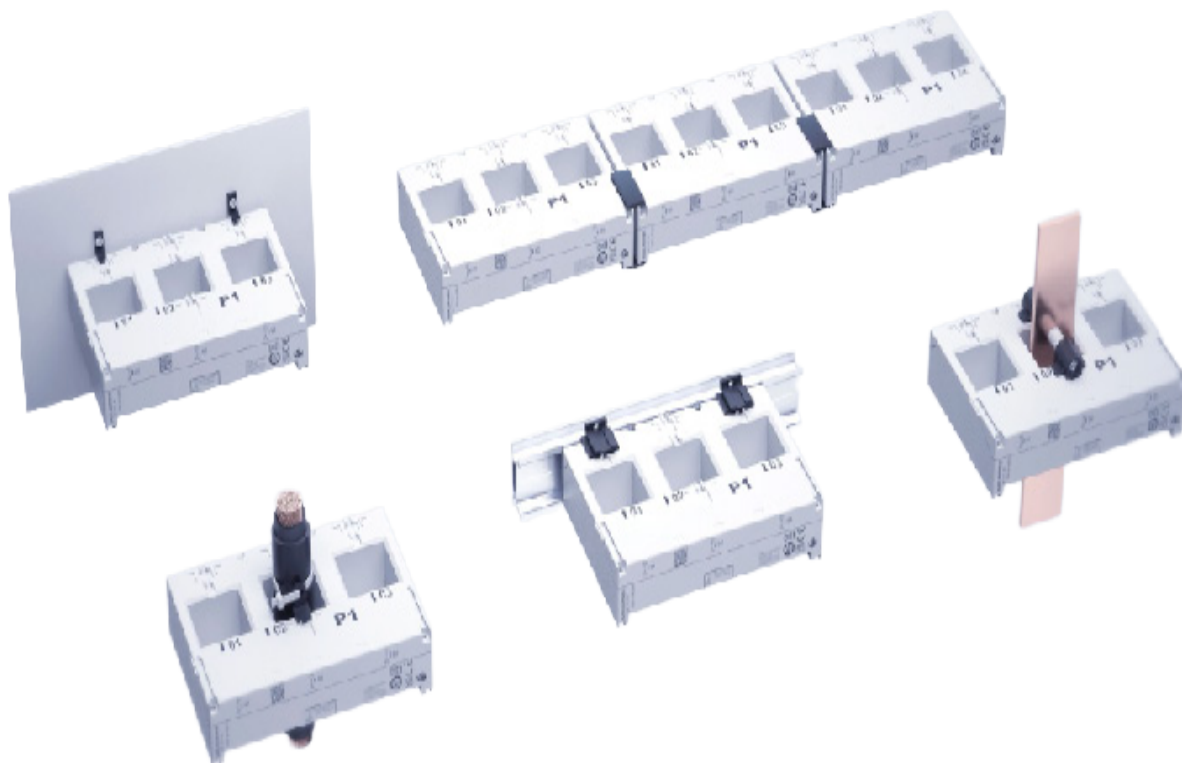


MODEL	Pitch (mm)	H x W x D (mm)	ØF (mm)
EMCT-160	24.8	71 X 75 X 32.8	13.5
EMCT-250	35	78 x 105 x 32.8	21
EMCT-630	45	92 x 135 x 32.8	31
EMCT-1000	55	106 x 165 x 32.8	41

» Compatible accessories

Mounting

Flexible installation options for **cables** or **bars**, combined with **DIN-rail** or **backplate mounting**, make the EMCT series suitable for a wide spectrum of applications—from compact electrical setups to high-power industrial environments.



Connection

The system uses a dedicated RJ12 signal cable to establish a direct connection between the energy meter and the three-phase current transformer blocks.

The signal cable is available in standard lengths of **1, 3, 5** and **10 m** to accommodate various installation layouts.



» UEM2L, UEM4L

ORDER CODE	MODEL	NOMINAL VOLTAGE AND FREQUENCY	POWER SUPPLY	CURRENT INPUT	CHANNELS	COM PORT
1124.0001.0001	UEM4L-A R	3x230/400V 50/60Hz	100 ... 277 V	EMCT CT blocks (not included)	4	RS485
1124.0002.0001	UEM2L-A R	3x230/400V 50/60Hz	100 ... 277 V	EMCT CT blocks (not included)	2	RS485

» EMCT range

ORDER CODE	MODEL	CURRENT RANGE	PITCH	ØF	REFERENCES
5401.0001.0001	EMCT-160	40 ... 160 A	24,8 mm	13.5 mm	UEM4L-A R, UEM2L-A R
5401.0002.0001	EMCT-250	63 ... 250 A	35 mm	21 mm	UEM4L-A R, UEM2L-A R
5401.0003.0001	EMCT-630	160 ... 630 A	45 mm	31 mm	UEM4L-A R, UEM2L-A R
5401.0004.0001	EMCT-1000	400 ... 1000 A	55 mm	41 mm	UEM4L-A R, UEM2L-A R

Accessories for wall/panel/bar/DIN mounting included.

» R12 connection cable

ORDER CODE	CABLE LENGTH	REFERENCES
7504.0001.0001	1 m	UEM4L-A R, UEM2L-A R, EMCT-160, EMCT-250, EMCT-630, EMC-1000
7504.0002.0001	3 m	UEM4L-A R, UEM2L-A R, EMCT-160, EMCT-250, EMCT-630, EMC-1000
7504.0003.0001	5 m	UEM4L-A R, UEM2L-A R, EMCT-160, EMCT-250, EMCT-630, EMC-1000
7504.0005.0001	10 m	UEM4L-A R, UEM2L-A R, EMCT-160, EMCT-250, EMCT-630, EMC-1000

Available cable lengths are listed in the above table.

During the installation, is not mandatory to use the same length for all channels, different lengths can be used with different CT blocks.

NOTE: Subject to change without notice

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