

- Energy Meters Ex9EMS are smart meters of electric energy. We provide wide range of types with various parameters. Rated current can be fixed or adjustable by Current Transformer. LCD display is a matter of course together with infrared eye for easy read out. Possibility of M-Bus or ModBus communication do from energy meters proper smart device.

Installation Smart Energy Meters Ex9EMS are suitable for residential and industrial applications. The biggest advantage is mounting on DIN rails inside consumer units. They will find their use everywhere where it is needed to count consumed energy.

We offer even cable for IR communication and software can be downloaded from our website.

Energy meters are offered in 1, 2 or 4-modules width versions.

Ex9	EMS	1P	1M	45A	—	1T
Product family	Product	Poles	Modules	Rated current	Communication	Tariffs
Ex9	EMS: Smart Energy Meters	1P 3P	1M 2M 4M	45A 100A CT: current transformer	—: — MB: M-Bus MO: ModBus	1T: 1 tariff 2T: 2 tariffs

CE

Smart Energy Meters **Ex9EMS**

Smart Energy Meters - 1 pole 1 module

- 1 or 2-tariff versions
- Optional M-Bus or ModBus communication
- Direct connection
- Width 1MU



Rated current	Communication	Article No.	Type	Packing
45 A	-	107287	Ex9EMS 1P 1M 45A 1T	1/1/60
45 A	-	107288	Ex9EMS 1P 1M 45A 2T	1/1/60
45 A	M-Bus	107289	Ex9EMS 1P 1M 45A MB 2T	1/1/60
45 A	ModBus	107290	Ex9EMS 1P 1M 45A MO 2T	1/1/60

Smart Energy Meters - 1 pole 2 modules

- 1 or 2-tariff versions
- Optional M-Bus or ModBus communication
- Direct connection
- Width 2MU



Rated current	Communication	Article No.	Type	Packing
100 A	-	107291	Ex9EMS 1P 2M 100A 1T	1/1/48
100 A	-	107292	Ex9EMS 1P 2M 100A 2T	1/1/48
100 A	M-Bus	107293	Ex9EMS 1P 2M 100A MB 2T	1/1/48
100 A	ModBus	107294	Ex9EMS 1P 2M 100A MO 2T	1/1/48

Smart Energy Meters - 3 poles 4 modules

- Optional M-Bus or ModBus communication
- Direct or CT connection
- Width 4MU



Rated current	Communication	Article No.	Type	Packing
100 A	-	107295	Ex9EMS 3P 4M 100A 2T	1/1/36
100 A	M-Bus	107296	Ex9EMS 3P 4M 100A MB 2T	1/1/36
100 A	ModBus	107297	Ex9EMS 3P 4M 100A MO 2T	1/1/36
CT	-	107298	Ex9EMS 3P 4M CT 2T	1/1/36
CT	M-Bus	107299	Ex9EMS 3P 4M CT MB 2T	1/1/36
CT	ModBus	107300	Ex9EMS 3P 4M CT MO 2T	1/1/36

Smart Energy Meters **Ex9EMS**

IR Connecting Cable

- Infrared connecting cable with USB
- Magnetic connection with bracket to prevent movement
- Need to use a bracket



Description	Article No.	Type	Packing
IR connecting cable with USB	109855	IR USB	1

Bracket for IR Cable

- Size depends on modular width of EMS energy meter



For energy meters	Article No.	Type	Packing
Ex9EMS 1P 1M	109856	IR BR 1M	1
Ex9EMS 1P 2M	109857	IR BR 2M	1
Ex9EMS 3P 4M	109858	IR BR 4M	1

Technical Data **Ex9EMS**

Smart Energy Meters

General parameters

All products have MID certification

1 or 2-tariff versions

Optional M-Bus or ModBus communication

Direct or CT connection

Electrical parameters

	Ex9EMS 1P 1M	Ex9EMS 1P 2M	Ex9EMS 3P 4M
Tested according to	EN 50470-1/3		
Nominal voltage U_n	230 V AC	230 V AC	3x230/400 V AC
Operational voltage	195-253 V AC	195-253 V AC	3x230/400 V $\pm$ 20%
Rated frequency f	50 Hz $\pm$ 10%	50 Hz $\pm$ 10%	45-60 Hz
Insulation capabilities:			
AC voltage withstand	4 kV for 1 minute		
Impulse voltage withstand	6 kV - 1.2 μ s waveform		
Basic current I_b	5 A	5 A	5 A (1.5 A for CT version)
Maximum rated current I_{max}	45 A	100 A	100 A (6 A for CT version)
Operational current range	$0.4I_b - I_{max}$		
Overcurrent withstand	$30I_{max}$ for 0.01 s		
Power consumption (active - reactive)	≤ 2 W/phase - ≤ 10 W/phase		
Test output flash rate (RED LED)	10 000 Imp/kWh		
Pulse output rate	10 000/2 000/1 000/100/10/1/0.1/0.01 Imp/kWh		
Pulse width	$\leq 5\ 625$ W ... 32 ms > 5 625 W ... 11.2 ms	1 000/100/10/1/0.1/0.01 Imp/kWh ... 31 ms 2 000 Imp/kWh < 30 kW ... 31 ms 2 000 Imp/kWh > 30 kW ... 15 ms 10 000 Imp/kWh < 6 kW ... 31 ms 10 000 Imp/kWh > 6 kW ... 15 ms 10 000 Imp/kWh > 12 kW ... 5 ms	1 000/2 000/10 000 pulses • 0 - 4 999 W ... 40 ms • 5 000 - 9 999 W ... 20 ms • 10 000-19 999 W ... 10ms • 20 000 - 39 999 W ... 5ms • > 40 000 W ... 2.5 ms 100 pulses • < 50 000 W ... 40 ms • > 50 000 W ... 20 ms Other pulses • always ... 40 ms
Data store	The data can be stored for more than 10 years without power		
Accuracy class	B ($\approx$ 1% accuracy)		
Basic errors:			
$0.05I_b$	$\cos \varphi = 1 \dots \pm 1.5\%$		
$0.1I_b$	$\cos \varphi = 0.5L \dots \pm 1.5\%$ $\cos \varphi = 0.5C \dots \pm 1.5\%$		
$0.1I_b - I_{max}$	$\cos \varphi = 1 \dots \pm 1.0\%$		
$0.2I_b - I_{max}$	$\cos \varphi = 0.5L \dots \pm 1.0\%$ $\cos \varphi = 0.5C \dots \pm 1.0\%$		
Infrared specification			
Infrared wavelengths	900 - 1 000 nm		
Communication distance	Direct contact		
Protocol	IEC62056-21:2002 (IEC1107)		
M-Bus com. spec. (MB version only)			
Bus type	M-Bus		
Baud rate	300, 600, 1 200, 2 400, 4 800, and 9 600 (default)		
Range	$\leq 1\ 000$ m		
Downlink signal	Master to slave. Voltage modulation		
Uplink signal	Slave to master. Current modulation		

Technical Data **Ex9EMS**

Smart Energy Meters

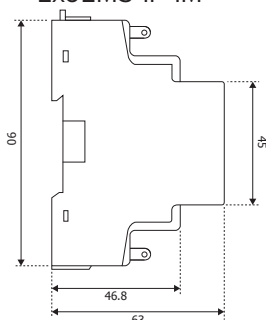
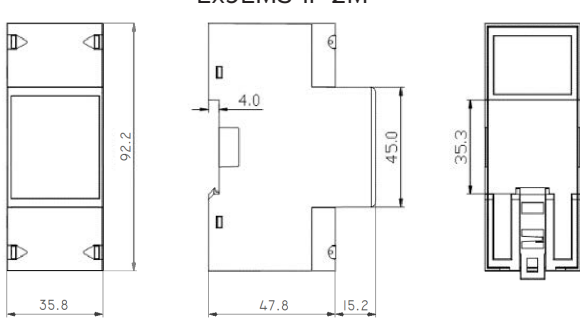
Electrical parameters			
	Ex9EMS 1P 1M	Ex9EMS 1P 2M	Ex9EMS 3P 4M
M-Bus com. spec. (MB version only)			
Cable	JYSTY (nx2x0.8)		
Protocol	EN13757-3		
Max. number of meters	64*		
ModBus com. spec. (MO version only)			
Bus type	RS485		
Protocol	ModBus RTU with 16 bit CRC		
Baud rate	1 200, 2 400, 4 800 and 9 600 (default)		
Address range	1-247 user settable		
Maximum bus load	60 meters per bus*		
Range	1 000 m		

*Note that the maximum number of meters is dependent on the converter, baudrate (the higher the baudrate, the smaller the number of meters which can be used) and the circumstances under which the meters are installed.

Software for programing energy meters thru infrared eye can be downloaded from our website www.noark-electric.eu.

For more informations and settings of Smart Energy Meters please see User Manual from our website.

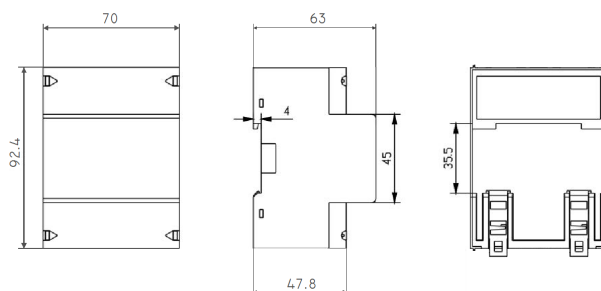
Mechanical parameters			
	Ex9EMS 1P 1M	Ex9EMS 1P 2M	Ex9EMS 3P 4M
Device width	17.5 mm	35.8 mm	70 mm
Device height	90 mm	92.5 mm	92.4 mm
Frame size	45 mm		
Mounting	onto 35 mm device rail (DIN)		
Degree of protection	IP 50		
Terminals	lift and screw terminals		
Max. L and N terminals capacity			
Solid copper	8 mm ²	35 mm ²	35 mm ²
Flex core	-	-	25 mm ²
Fastening torque of L and N terminals	2.4 Nm		
Max. Auxiliary terminals capacity	2.5 mm ²		
Fastening torque of auxiliary terminals	0.1 Nm		
Ambient temperature	-25°C — +55°C	-40°C — +70°C	Direct: -40°C — +70°C CT: -25°C — +70°C
Operating humidity	≤ 75%		
Insulation class	II		
Weight	0.08 kg	0.16 kg	0.39 kg

Dimensions			
Ex9EMS 1P 1M 		Ex9EMS 1P 2M 	

Smart Energy Meters

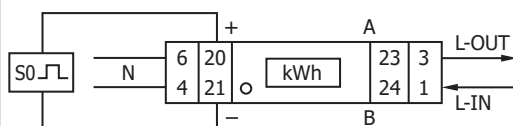
Dimensions

Ex9EMS 3P 4M



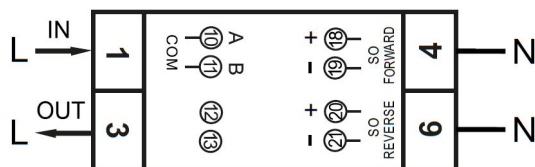
Wiring diagrams

Ex9EMS 1P 1M



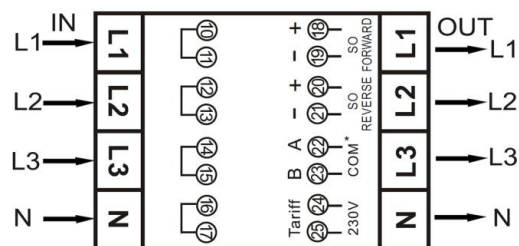
- | | |
|-------|---|
| 1 | Phase line in (L-IN) |
| 3 | Phase line out (L-OUT) |
| 4 | Neutral line in (N) |
| 6 | Neutral line out (N) |
| 20/21 | Pulse output contact (S0) |
| 23/24 | Ex9EMS 1P 1M 45A 1T Not in use |
| | Ex9EMS 1P 1M 45A 2T External tariff input (230V) |
| | Ex9EMS 1P 1M 45A MB 2T M-Bus communication contact |
| | Ex9EMS 1P 1M 45A MO 2T ModBus communication contact |

Ex9EMS 1P 2M



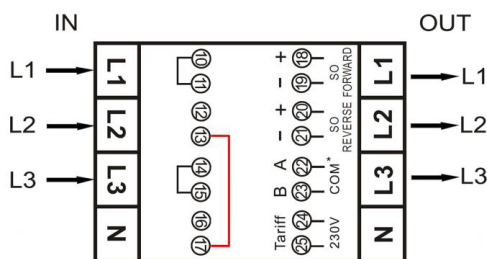
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|-------|--|
| 1 | Phase line in (L-IN) |
| 3 | Phase line out (L-OUT) |
| 4 | Neutral line in (N) |
| 6 | Neutral line out (N) |
| 10/11 | M-Bus/ModBus communication contact |
| | (Ex9EMS 1P 2M 100A MB 2T & Ex9EMS 1P 2M 100A MO 2T only) |
| 12/13 | External tariff input (Ex9EMS 1P 2M 100A 2T only) |
| 18/19 | Pulse output contact (S0) forward |
| 20/21 | Pulse output contact (S0) reverse |

Ex9EMS 3P 4M - Direct connected - 3P 4W



- | | |
|---------|---|
| L1 (in) | Phase 1 input - L1 (out) Phase 1 output |
| L2 (in) | Phase 2 input - L2 (out) Phase 2 output |
| L3 (in) | Phase 3 input - L3 (out) Phase 3 output |
| N (in) | Neutral input - N (out) neutral output |
| 10/11 | not used |
| 12/13 | not used |
| 14/15 | not used |
| 16/17 | not used |
| 18/19 | Forward pulse output contact (S0) |
| 20/21 | Reverse pulse output contact (S0) |
| 22/23 | M-Bus / ModBus communication contact |
| 24/25 | External tariff input (230V) |

Ex9EMS 3P 4M - Direct connected - 3P 3W Open Delta (Aron)

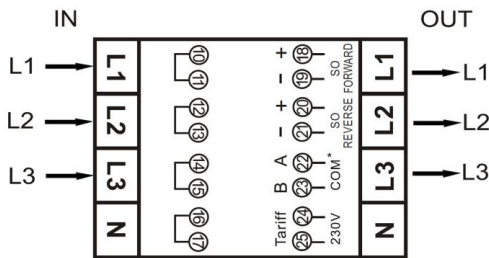


- | | |
|---------|---|
| L1 (in) | Phase 1 input - L1 (out) Phase 1 output |
| L2 (in) | Phase 2 input - L2 (out) Phase 2 output |
| L3 (in) | Phase 3 input - L3 (out) Phase 3 output |
| N (in) | not used - N (out) not used |
| 10/11 | not used |
| 12/13 | to be connected to 16/17 |
| 14/15 | not used |
| 16/17 | to be connected to 12/13 |
| 18/19 | Forward pulse output contact (S0) |
| 20/21 | Reverse pulse output contact (S0) |
| 22/23 | M-Bus / ModBus communication contact |
| 24/25 | External tariff input (230V) |

Smart Energy Meters

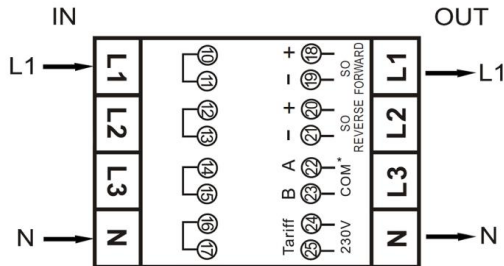
Wiring diagrams

Ex9EMS 3P 4M - Direct connected - 3P 3W Delta



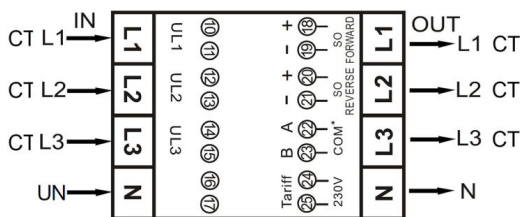
L1 (in) Phase 1 input - L1 (out) Phase 1 output
 L2 (in) Phase 2 input - L2 (out) Phase 2 output
 L3 (in) Phase 3 input - L3 (out) Phase 3 output
 N (in) not used - N (out) not used
 10/11 not used
 12/13 not used
 14/15 not used
 16/17 not used
 18/19 Forward pulse output contact (S0)
 20/21 Reverse pulse output contact (S0)
 22/23 M-Bus / ModBus communication contact
 24/25 External tariff input (230V)

Ex9EMS 3P 4M - Direct connected - 1P 2W Single phase



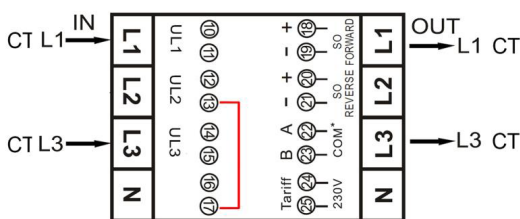
L1 (in) Phase 1 input - L1 (out) Phase 1 output
 L2 (in) not used - L2 (out) not used
 L3 (in) not used - L3 (out) not used
 N (in) Neutral input - N (out) neutral output
 10/11 not used
 12/13 not used
 14/15 not used
 16/17 not used
 18/19 Forward pulse output contact (S0)
 20/21 Reverse pulse output contact (S0)
 22/23 M-Bus / ModBus communication contact
 24/25 External tariff input (230V)

Ex9EMS 3P 4M - CT - 3P 4W



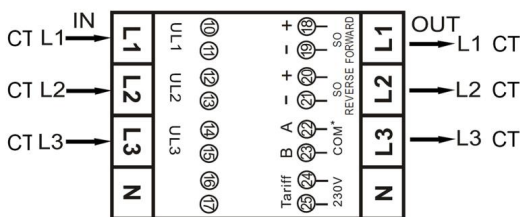
CT1 (in) Phase 1 input - CT1 (out) Phase 1 output
 CT2 (in) Phase 2 input - CT2 (out) Phase 2 output
 CT3 (in) Phase 3 input - CT3 (out) Phase 3 output
 UN (in) Neutral input - UN (out) neutral output
 10/11 Phase 1 - UL1
 12/13 Phase 2 - UL2
 14/15 Phase 3 - UL3
 16/17 not used
 18/19 Forward pulse output contact (S0)
 20/21 Reverse pulse output contact (S0)
 22/23 M-Bus / ModBus communication contact
 24/25 External tariff input (230V)

Ex9EMS 3P 4M - CT - 3P 3W Open Delta (Aron)



CT1 (in) Phase 1 input - CT1 (out) Phase 1 output
 CT2 (in) not used - CT2 (out) not used
 CT3 (in) Phase 3 input - CT3 (out) Phase 3 output
 UN (in) not used - UN (out) not used
 10/11 Phase 1 - UL1
 12 Phase 2 - UL2
 13 to be connected to 17
 14/15 Phase 3 - UL3
 17 to be connected to 13 (16 not used)
 18/19 Forward pulse output contact (S0)
 20/21 Reverse pulse output contact (S0)
 22/23 M-Bus / ModBus communication contact
 24/25 External tariff input (230V)

Ex9EMS 3P 4M - CT - 3P 3W Delta

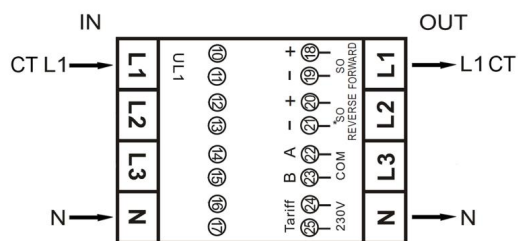


CT1 (in) Phase 1 input - CT1 (out) Phase 1 output
 CT2 (in) Phase 2 input - CT2 (out) Phase 2 output
 CT3 (in) Phase 3 input - CT3 (out) Phase 3 output
 UN (in) not used - UN (out) not used
 10/11 Phase 1 - UL1
 12/13 Phase 2 - UL2
 14/15 Phase 3 - UL3
 16/17 not used
 18/19 Forward pulse output contact (S0)
 20/21 Reverse pulse output contact (S0)
 22/23 M-Bus / ModBus communication contact
 24/25 External tariff input (230V)

Smart Energy Meters

Wiring diagrams

Ex9EMS 3P 4M - CT - 1P 2W - Single phase



- CT1 (in) Phase 1 input - CT1 (out) Phase 1 output
- CT2 (in) not used - CT2 (out) not used
- CT3 (in) not used - CT3 (out) not used
- UN (in) Neutral input - UN (out) neutral output
- 10/11 Phase 1 - UL1
- 12/13 not used
- 14/15 not used
- 16/17 not used
- 18/19 Forward pulse output contact (S0)
- 20/21 Reverse pulse output contact (S0)
- 22/23 M-Bus / ModBus communication contact
- 24/25 External tariff input (230V)