

Three-phase active and reactive energy
meter direct connection

EWGE31xAxRx

Brochure
2024



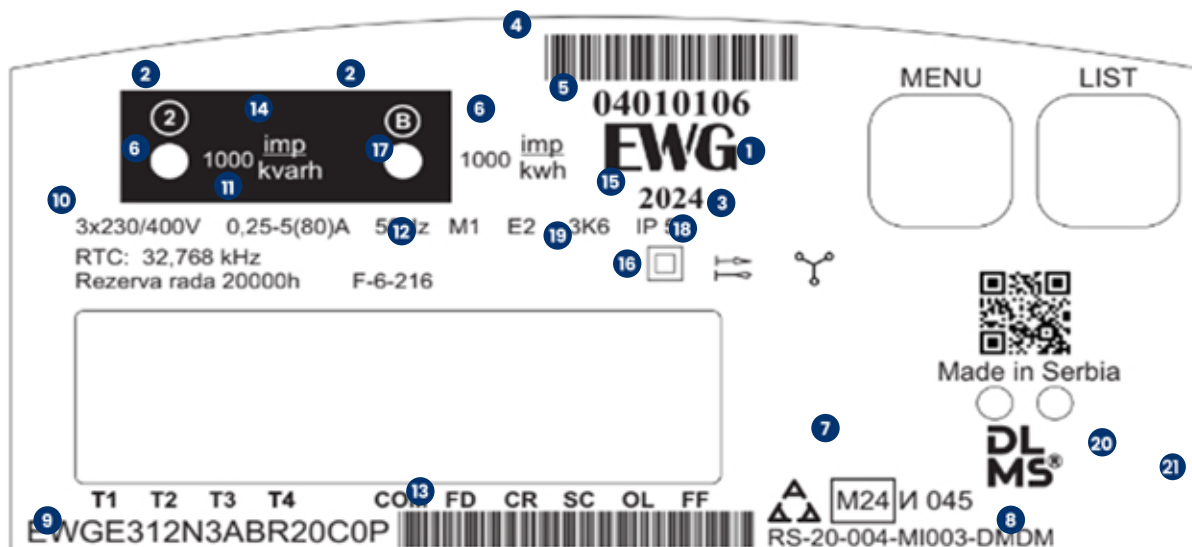
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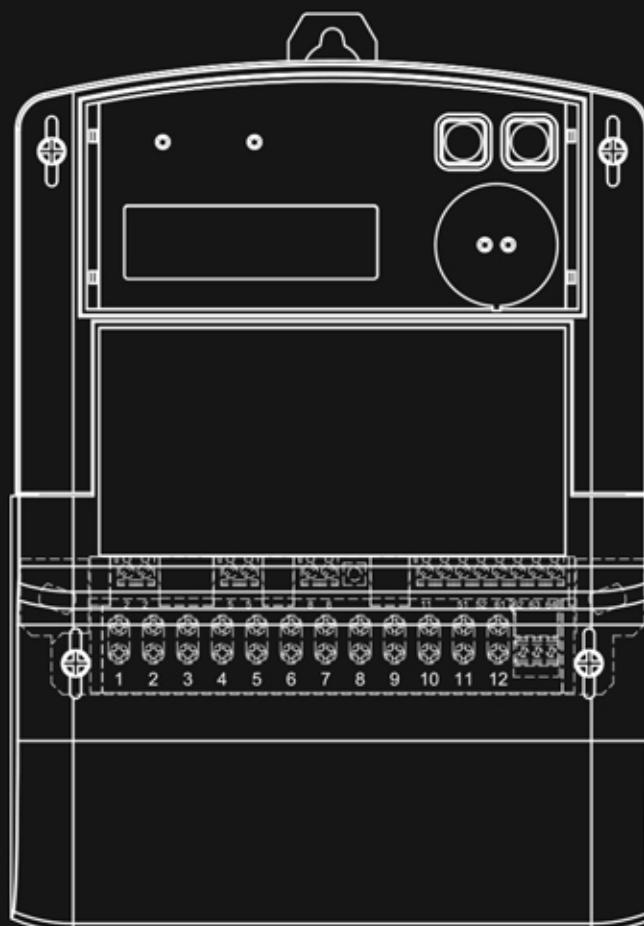
EWG doo in Belgrade specializes in the production of electricity meters and associated communication equipment used for the operation of meters in advanced metering infrastructure (AMI). All devices from our portfolio have the capability to communicate with the data center and enable remote reading of relevant data, as well as the ability to manage consumption using switch modules.

The basic portfolio of our products includes meters for households and industrial consumers, which can be initially or subsequently equipped with modules enabling the device for remote communication using one of the communication platforms (GPRS, 3G, PLC, RF, RS485 etc).

Additionally, all devices can be equipped with switch modules, which can be integrated (in the meter housing) or externally installed as an additional module.



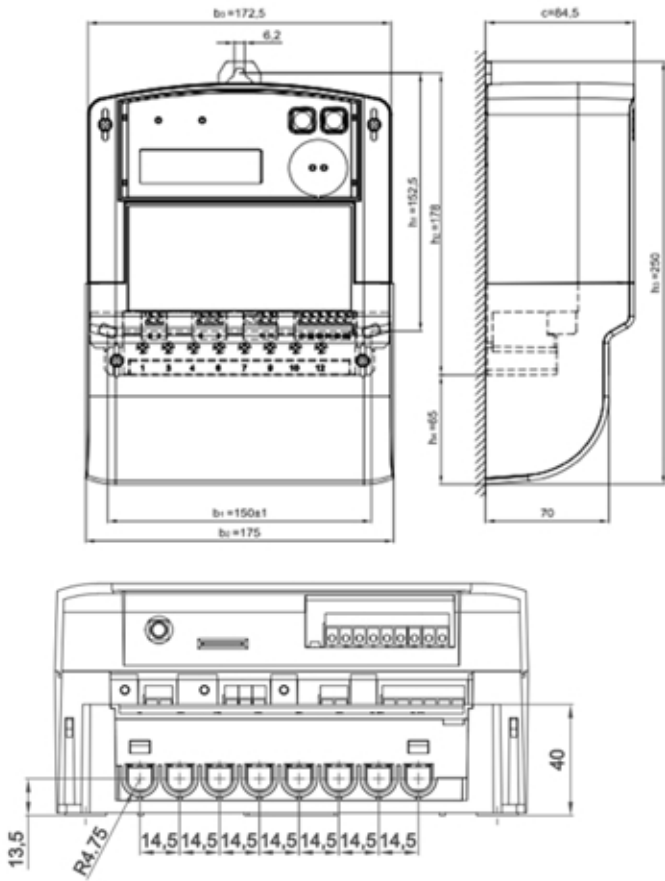
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|--|--|
| 1. Manufacturer's name | 13. Reference voltage |
| 2. Declared accuracy class | 14. Minimum, reference and maximum current |
| 3. Year of production | 15. Marked frequency |
| 4. Barcode with serial number of the meter | 16. IP54 degree of protection marking |
| 5. Meter serial number | 17. Class II insulation class marking |
| 6. Optical pulse output meter constants | 18. Mechanical class M2 |
| 7. Serbian conformity mark and supplementary metrological mark | 19. Electromagnetic class E2 |
| 8. Certificate number | 20. Operating temperature range 3K6 |
| 9. Type approval marking | 21. Communication protocol |
| 10. Display markings T1-T4 active tariff | |
| 11. Meter type designation | |
| 12. Barcode corresponding to the meter type designation | |



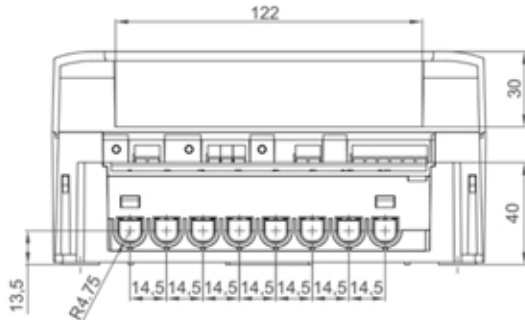
The EWGE31xAxRx meters are three-phase electronic (static) meters designed for direct four-wire connection to the electric distribution network.

The EWGE31xAxRx meters are intended for measuring consumed active and reactive energy, as well as the maximum average power in up to four tariffs, instantaneous (effective) values of active power, current, and voltage.

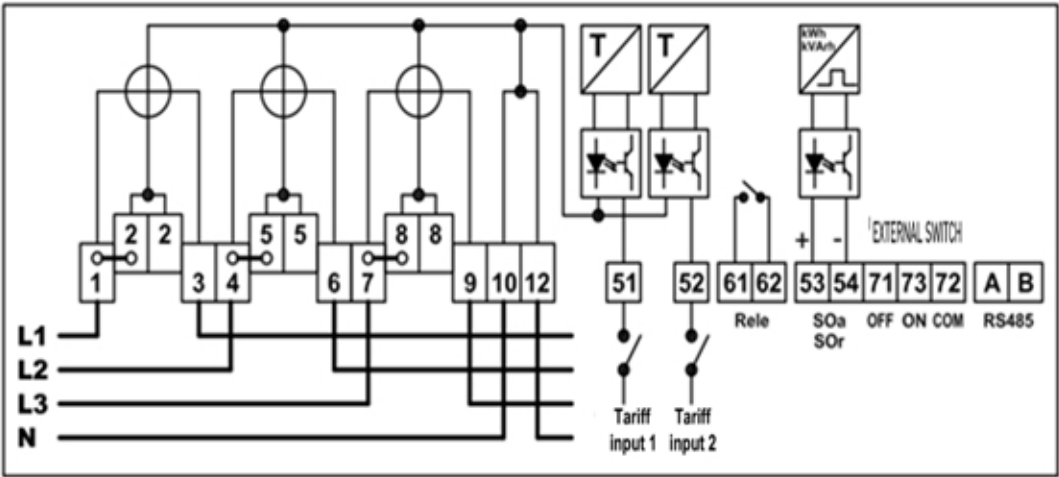
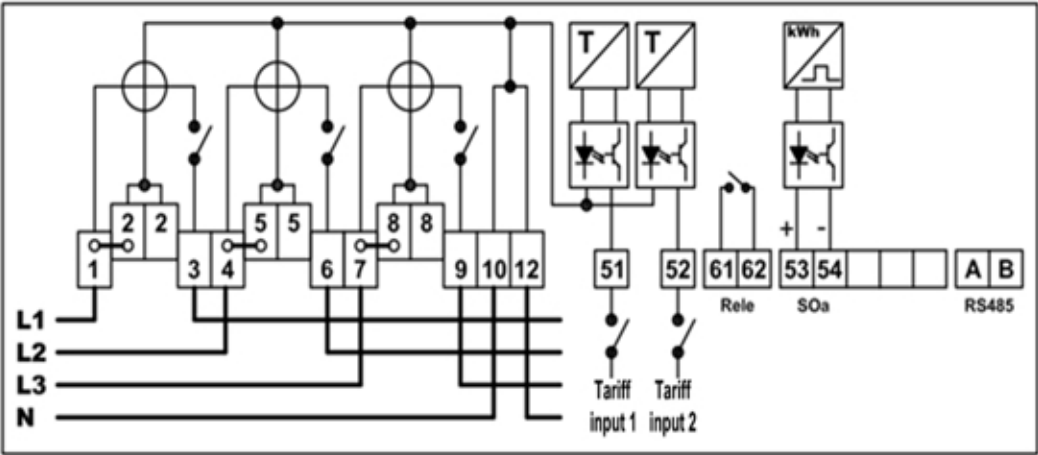
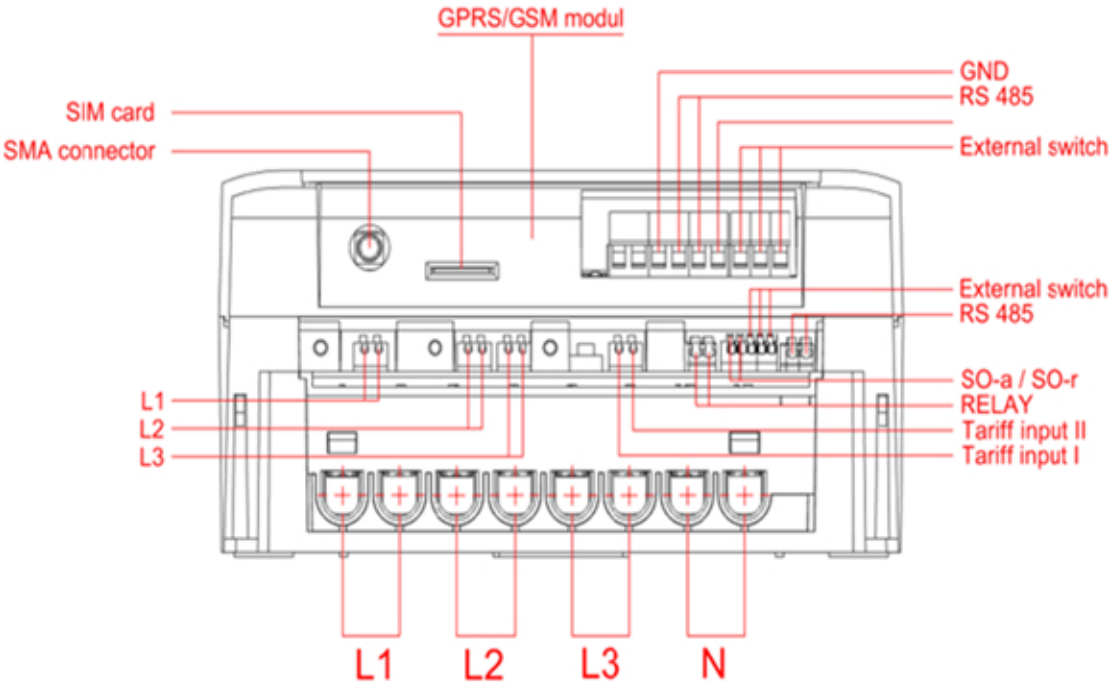
To manage the tariffs of the EWGE31xAxRx meters, you can use the built-in real-time clock and tariff calendar or an external tariff device (time switch).



Label	dimensions in mm
b1	105± 1
b2	175
b3	172.5
h1	152.5
h2	178
h3	250
h4	65
c	84.5



Connection		label
Tariff inputs	tariff input 1	51
	tariff input 2	52
Electrical test output	SO-a/SO-r positive	53
	SO-a/SO-r negative	54
RElay	Input	61
	Output	62
EXTERNAL SWITCH	Off	71
	Com	72
	On	73
	5v	74
RS485	input	A
	output	B





The EWGE31xAxRx type meters are designed and manufactured in accordance with EN50470-1 and EN50470-3 standards, as well as IEC62053-21, IEC62053-22, and IEC62053-23 standards.

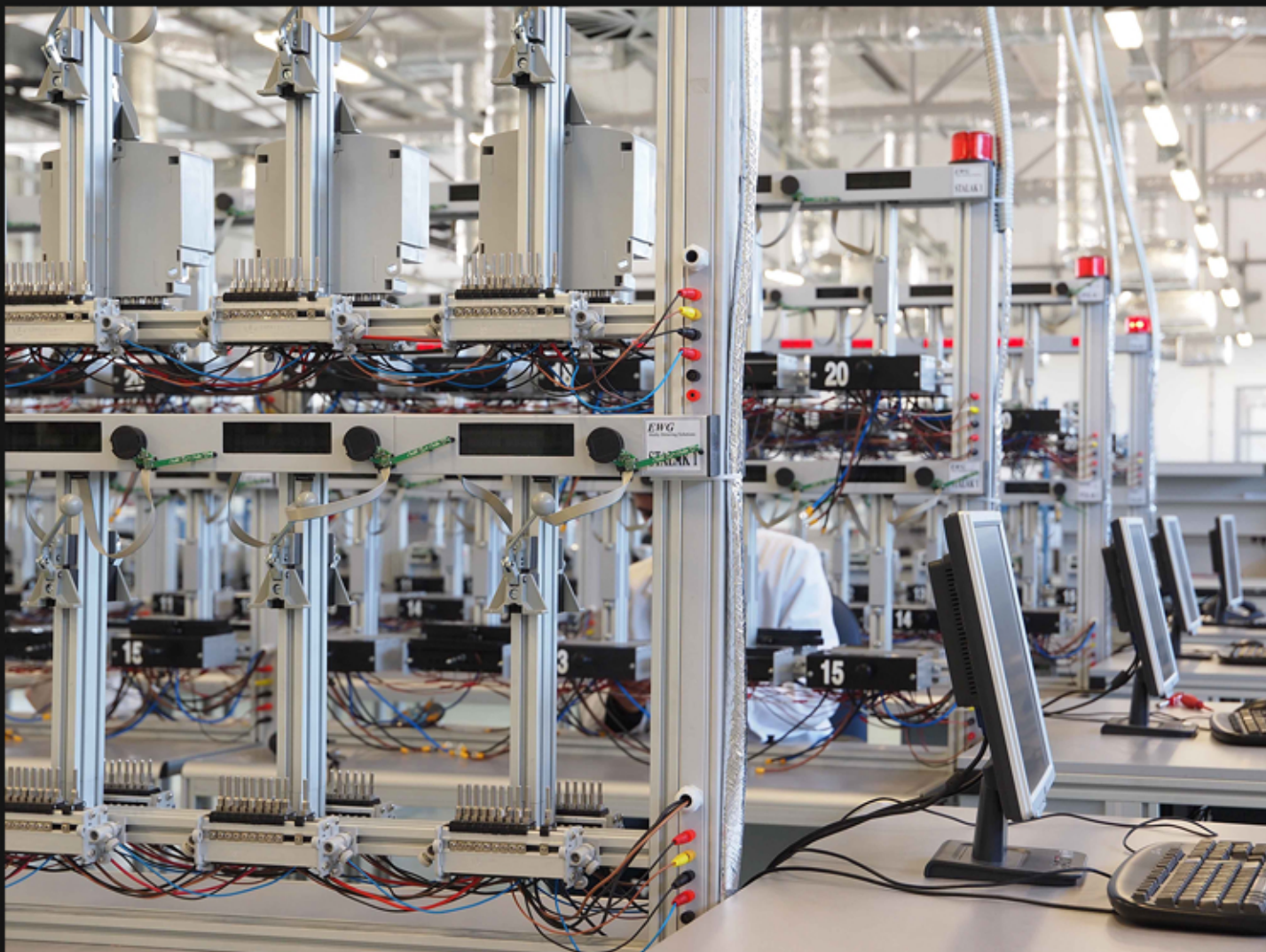
The purpose-built seven-segment LCD display fully complies with VDEW standards and is used to display measured and recorded values in three operating modes: automatic, manual, and test mode.

EWGE31xAxRx type meters register and store profiles of measured and recorded values as well as event logs relevant to the operation of the meters.

Technical specifications of the meter

ewg.rs

Technical specifications		Memory of profiled measured registered quantities	5 profiles, 10 channels
Nominal voltage	3x230/400 V	Profile of calculated quantities	24 records
Voltage range	0.8U _n - 1.15U _n	Load profile	5760 records
Nominal frequency	50 Hz	Hourly value profile of c. q.	5760 records
Reference current	5 A	Daily value profile of c.q.	1000 records
Maximum current	80 A	Profiled measured values	1000 records
Transient current	500 mA	Standard events logbook	1000 records
Minimum current	250 mA	Electric power quality logbook	1000 records
Start-up current	25 mA for Class 2 (A)	Integrity breakdown logbook	1000 records
	20 mA for Class 1 (B)	Power limitation logbook	1000 records
Direction of energy	Imported/exported	Communication events logbook	1000 records
Accuracy class	Active energy: A and B (EN50470 -1 i EN50470 -3) 1 and 2 (IEC62053-21)	Power cut events logbook	1000 records
	Reactive energy: 2 and 3 (IEC62053-23)		
Self-consumption per phase	Voltage circuit: < 3 W i 15 VA		
	Current circuit: < 2.5 VA for Class 2 (A) < 4 VA for Class 1 (B)		
Number of tariffs	up to 4		
Optical output constant	1.000 impulses/kWh (kVAh)		
Electrical output constant	500 impulses/kWh (kVAh)		
Mechanical protection class	M1		
Electromagnetic protection class	E2		
Insulation class (electrical)	II		
Operating temperature	25 °C to +55 °C		
Storage temperature	40 °C to + 70 °C		
Waterproofing	IP54		
		Display type	LCD
		No. of digits to disp. values	8
		No. of digits for disp. OBIS codes	5
		Profile of billing values measurement size	8mm / 6mm
		Display modes	Automatic Manual Test
		Number of digits for displaying total energy	6 whole 2 decimal in A/M mode, 5 whole 3 decimal in Test mode
		Display of max. average power	5 whole 3 decimals
		Indication of voltage presence	3 symbols L1, L2, L3
		Indication of meter status	5 symbols
		Display size period	Programmable 5 to 20 seconds



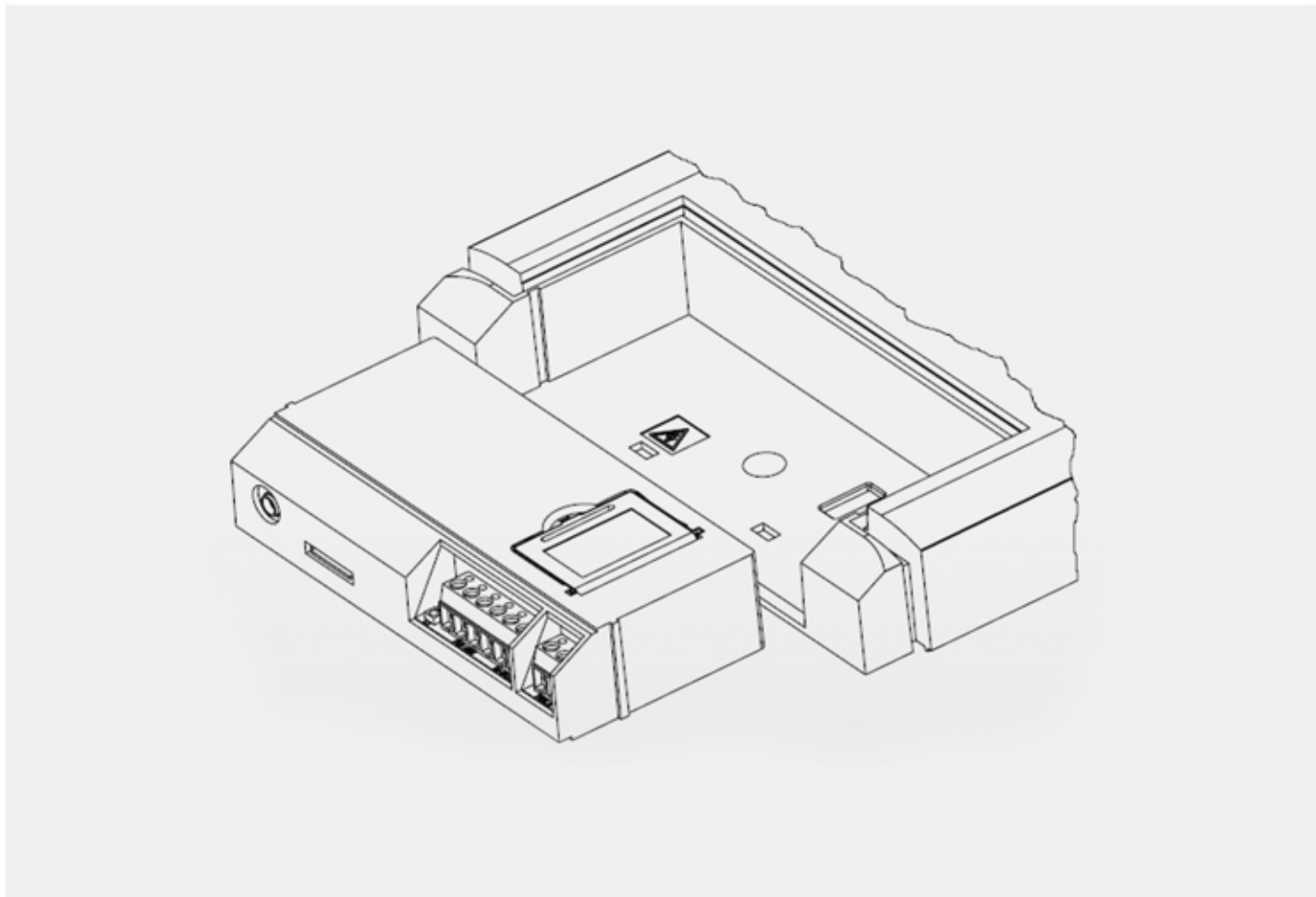
EWG meters feature an optical port for local communication with the meter in accordance with the standard for direct data exchange IEC 62056-21.

At the physical level, the optical interface complies with IEC 62056-21 mode C, while at the application level it is in line with IEC 62056-46 DLMS/COSEM. The electrical communication channel is implemented at the TTL level of a serial interface.

All EWG meters have the capability for PLUG-IN connection of external modules such as GPRS modem, PLC modem (S-FSK and OFDM modulation), RS485 module, and RF modem. The electrical interface is optically isolated.

EWG meters are ready to be integrated into a meter reading system.

	EWG	No. of phases	Connection	Direction	Current	Class active	Class reactive	Modem	Switch	Processor
		E3	1	1	N3	AB	R20	CO	S	P
Number of measuring systems	One measuring system	E1								
	Two measuring systems	E2								
	Three measuring systems	E3								
Connection	Direct		1							
	Current metering transformer		2							
	Voltage metering transformer		3							
	Current and voltage metering transformer		4							
Direction of energy flow	Total active energy A			1						
	Delivered/received active energy A+/A-			2						
Primary (maximum) current	5(40) A				N1					
	5(60) A				N2					
	5(80) A				N3					
	10(40) A				N4					
	10(60) A				N5					
	10(80) A				N6					
	5(6) A				N7					
	5(10) A				N8					
	5(100) A				N9					
	10(100) A				N10					
Accuracy class of active energy	0.2S					A02S				
	0.5S					AC				
	1					AB				
	2					AA				
Accuracy class of reactive energy	2						R20			
	3						R30			
Internal modems	RS485 modul							CO		
	Celular modem							C1		
	PLC modem							C2		
Switch	Without switch									
	With internal switch								S	
Processor	ARM with FO									
	ARM with GO									P

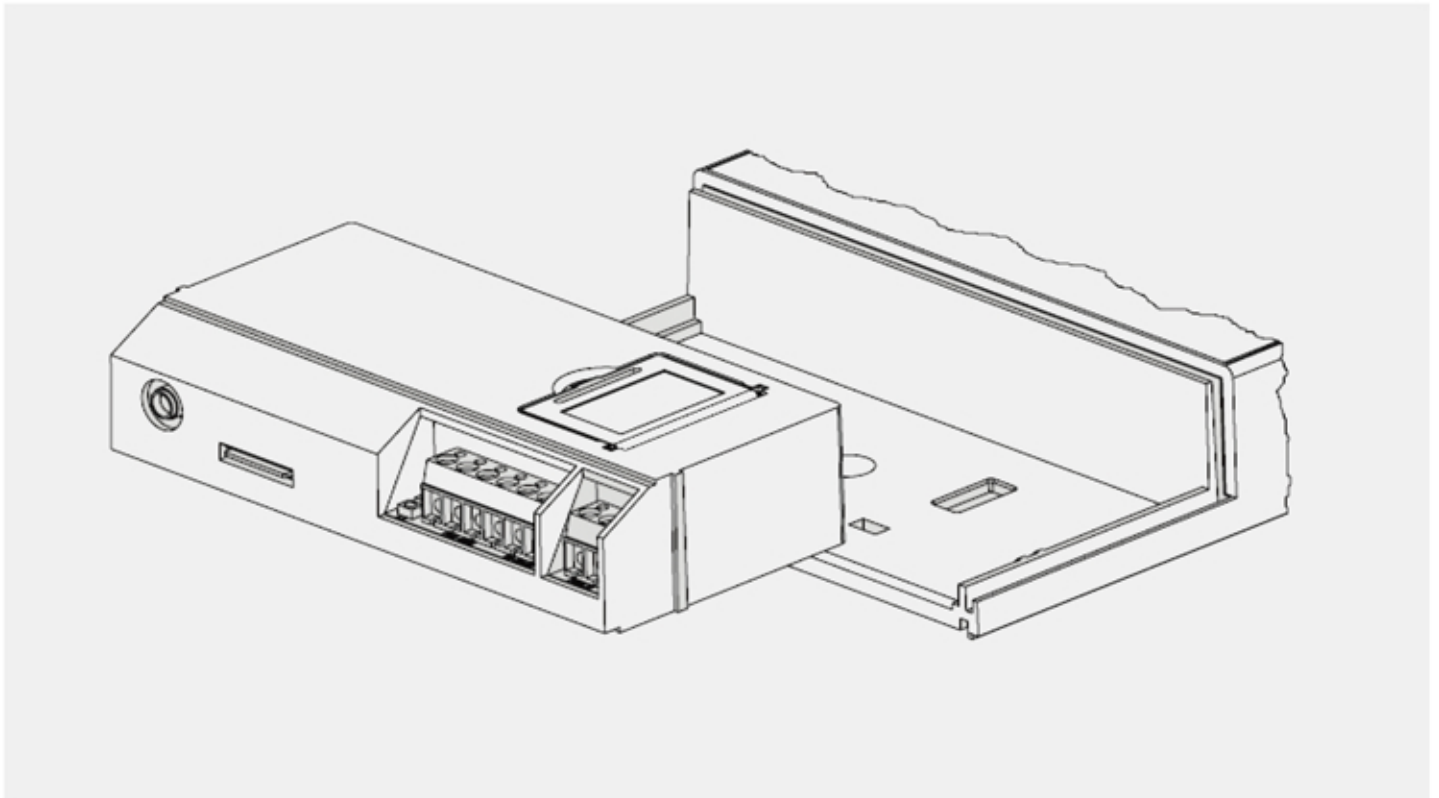


The EWG E300/E400 GPRS/GSM communication modem is designed for installation on all types of EWG meters. The primary function of the EWG E300/E400 is to establish communication between the EWG meter with the installed modem and the AMM center using GSM/GPRS mobile network.

The EWG E300/E400 modem uses 2G network. It is a modular type modem housed in a casing with dimensions of 30x60x122mm, made of high-quality self-extinguishing polycarbonate reinforced with 10% glass fibers. All types of EWG meters have space below the connection cover for installing the EWG E300 modem via a 10-pin connector based on PLUG-IN principle. .

Connection	Label	Description
1		Not in use
2		Not in use
3	GND	GND input RS485
4	A	RS485 terminal A
5	B	RS485 terminal B
6	74	External switch power supply
7	71	OFF- external switch turned off
8	73	ON- external switch turned on
9	72	COM- common end for external switch

GPRS MOBILE STATION CLASS	B
GPRS MULTI SLOT CLASS	10
Dual band GSM/GPRS	900/1800
Output	Class 4 (2W)@ 900 MHz
	Class 1 (1W)@ 1800 MHz
AT commands	In compliance with 3GPP 27.005 27.007
Self-consumption	OFF 62 μ A standby (registrovan, energy saving): 1.5 mA@ DRKS = 9
	Standby (registrovan, energy saving, GPS hibernation): 1.55 mA@ DRKS = 9
Serial port multiplexer	3GPP 27.010
TCP/IP adress	Via AT commands
Sensitivity	107 dBm (tipicno)@ 900 MHz
	106 dBm (tipicno)@ 1800 MHz
Operating temperature range	-25°C do 55°C
External antenna	SMA
COSEM WRAPPER	IEC 62056-47
COSEM APPLICATION LAYER	IEC 62056-53
COSEM Interface objects	IEC 62056-62



At the bottom of the EWG E300/E400 modem, on the left side of the connectors, there are 3 LED lights used to indicate the modem's operation.

The bottom LED (LED1) indicates the modem's status:

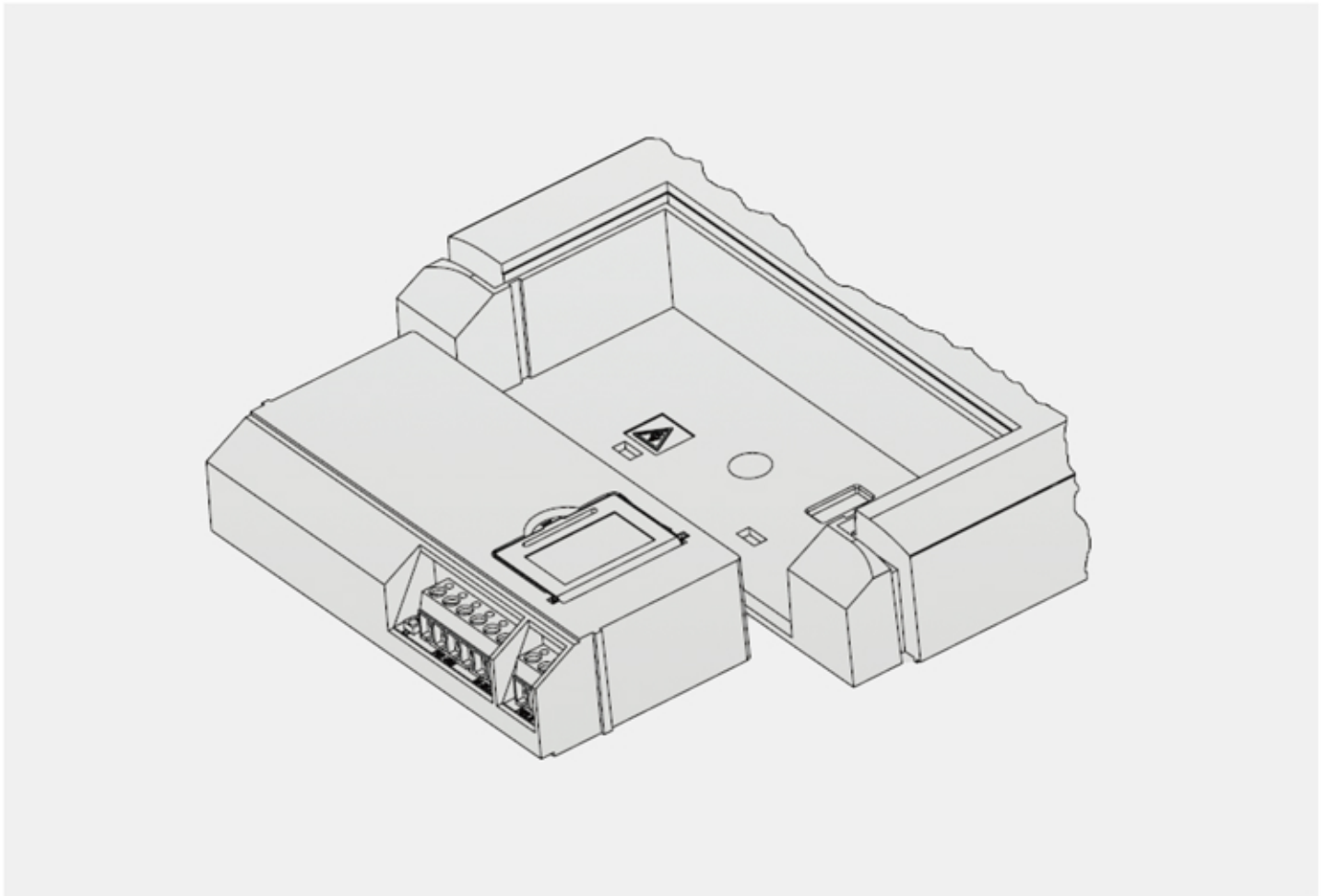
1. Modem is off – LED3 is off
2. Modem is on but not registered to the GSM network – (50% duty cycle with a 1-second period)
3. Modem is on and registered to the GSM network – (33% duty cycle with a 3-second period)

LED2 (middle diode) indicates the communication status:

1. Resetting state (100% duty cycle with a period of 1 second)
2. Initialization state (80% duty cycle with a period of 1 second)
3. Connecting or waiting for connection state (20% duty cycle with a period of 3 seconds)
4. Connection established state (80% duty cycle with a period of 3 seconds)

LED3 (top diode) indicates the network signal quality:

1. No signal < -110dB (LED off)
2. Poor signal < -100dB (20% duty cycle with a period of 1 second)
3. Fair signal < -85dB (20% duty cycle with a period of 3 seconds)
4. Good signal (80% duty cycle with a period of 3 seconds)



The PLC modem is used for remote communication of meters using the low-voltage distribution network as a medium for data transmission.

Meter communication via the PLC modem is established with a concentrator installed in the 10(20)/.4 kV substation from which the meter is powered, and indirectly through the concentrator and with the remote meter reading and consumption management center.

Connection	Label	Description
1	75	nput RS485 mass (optional)
2	76	RS-485 (optional)
3	77	RS-485 (optional)
4		Not used
5		Not used
6		Not used
7	71	OFF - Disabling the external clutch (optional)
8	73	ON- Engage external clutch (optional)
9	72	COM - External clutch control (optional)

Next to the terminal terminals, there are two LED diodes that signalize specific functions of the PLC modem

LED1 indicates the presence of power to the PLC modem:

1. No power supply (LED1 is not lit)
2. Power supply present (LED1 is lit)

LED2 indicates communication with the PLC chip:

1. No communication (LED2 is not lit)
2. Communication present (LED2 blinks)

The frequency of turning on and off LED2 is proportional to the speed at which the PLC chip comms. (1200bps, 2400bps).

On the display of the counter in the lower right part, there is an indicator labeled "COM".

When the counter connects to the concentrator via the PLC modem, this indicator is turned on.

Description	Value	Comment
Power supply	12V	Optically isolated
Own consumption		
During transmission	5W	@10 network impedance
In standby mode	0.6W	
Rated frequency	50Hz	
Isolation		
AC Test	4kV @50Hz, 1 min	Meter modem
Pulse voltage	6 kV@ 1.2/50 μs	Meter modem
Electromagnetic compatibility		
Electrostatic discharge IEC61000-4-2 (§7.4.5)	Contact 8kV Air 15kV	Meter modem
Electromagnetic field IEC61000-4-3 (§7.4.6)	30 V/m - (80 MHz - 2 GHz)	Meter modem
Burst test IEC61000-4-4 (§7.4.7)	Main connections - 4 kV Auxiliary connections - 2 kV	Meter modem
Surge test IEC61000-4-5 (§7.4.9)	4 kV 1.2/50 μs	Meter modem
Resistance to conduction interference induced by RF field in accordance with IEC 61000-4-6 (§7.4.8)	10 V/m	Meter modem
Radio interference suppression in accordance with IEC 61000-4-6 (§7.4.13)	EN55022	Meter modem
Environmental impact		
Operating temperature	-25 do +55 °C	
Storage temperature	-40 do +70 °C	
Sealing	IP 54	Protection by meter casing

The EWG RS485 is a communication module designed for serial communication of a larger number of EWG meters via the RS485 bus. The main purpose of the module is to enable remote reading of multiple EWG meters through a single communication modem (GPRS or PLC) using serial communication between meters over the RS485 bus as the medium for data transmission.

The meter communication via the PLC modem is established with a concentrator installed in the 10(20)/.4 kV substation that supplies power to the meter, and indirectly through the concentrator and with the center for remote meter reading and consumption management.

Connector	Label	Description
1	GND	Mass for input RS485
2	A	Input A of the RS485 line
3	B	Input B of the RS485 line
4	A	Output A of the RS485 line
5	B	Output B of the RFS845 line
6	74	Power supply for external switchgear (optional)
7	71	OFF - deactivation of external switchgear (optional)
8	73	ON - activation of external switchgear (optional)
9	72	Control of external switchgear(optional)



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