EWG
LECTRICITY WATER GAS

Ewg d.o.o.
Belgrade, Serbia
2024

Three-phase energy meter
for transformer connection

EWGE32xAxRxx

Brochure
2024

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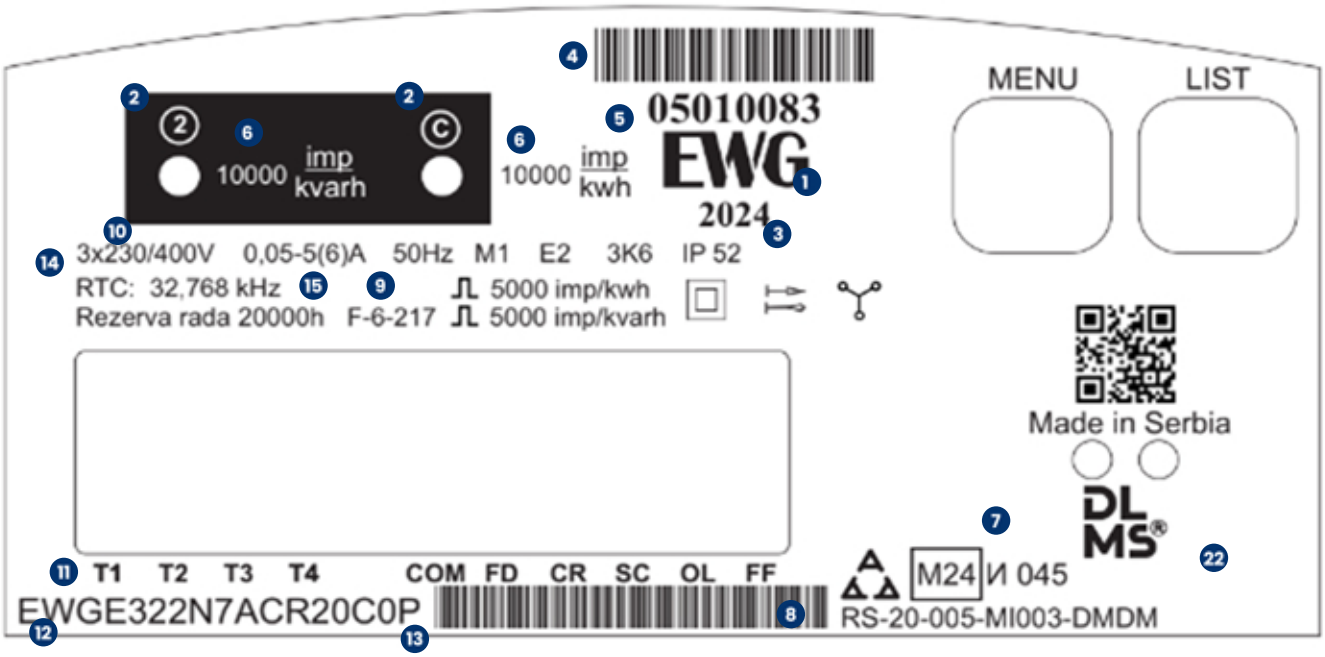
Content

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

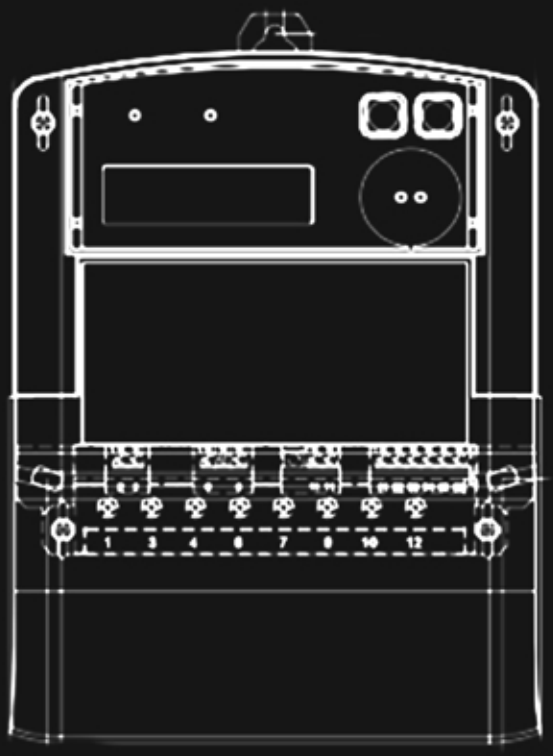
The basic portfolio of our products includes meters for households and industrial consumers, which can be initially or subsequently equipped with modules enabling the device for remote communication using one of the communication platforms (GPRS, 3G, PLC, RF, RS485 etc).

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

Name plate labels



1. Manufacturer's name
2. Declared accuracy class
3. Year of production
4. Barcode with meter serial number
5. Meter serial number
6. Optical pulse output meter constants
7. Serbian conformity mark and supplementary metrological mark
8. Certificate number
9. Type approval marking
10. Electric pulse output constant
11. Display markings for T1-T4 active tariff
12. Meter type designation
13. Barcode corresponding to the meter type designation
14. Reference voltage
15. Minimum, reference, and maximum current
16. Rated frequency
17. IP52 degree of protection marking
18. Class II insulation class marking
19. Mechanical class M2
20. Electromagnetic class E2
21. Operating temperature range 3K6
22. Communication protocol

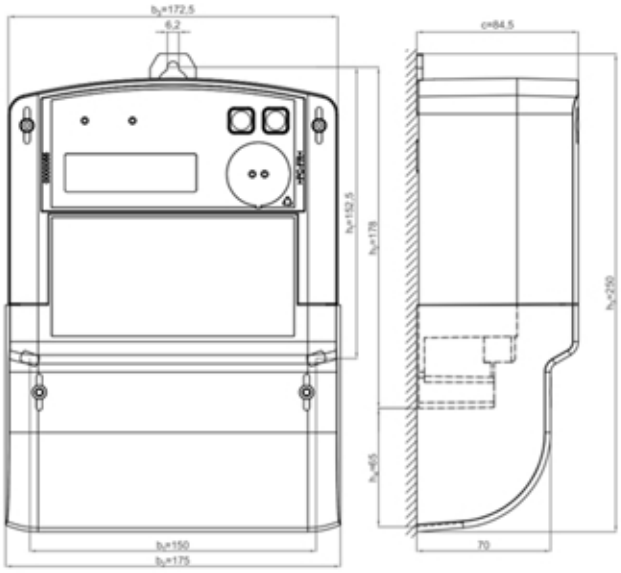


The meters of type EWGE32xAxRx are three-phase electronic (static) meters designed for connection to a four-wire electrical distribution network via current measuring transformers.

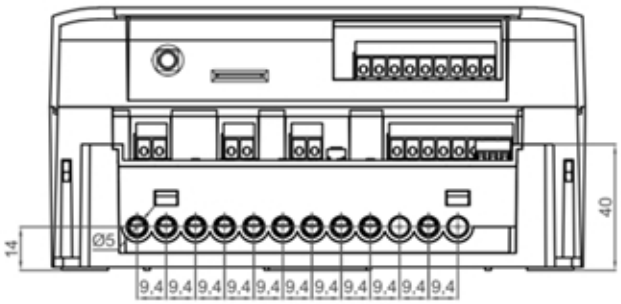
The meters of type EWGE32xAxRx are intended for measuring consumed active and reactive energy, as well as maximum average power in up to four tariffs, instantaneous (effective) values of active power, current and voltage, power factor and THD.

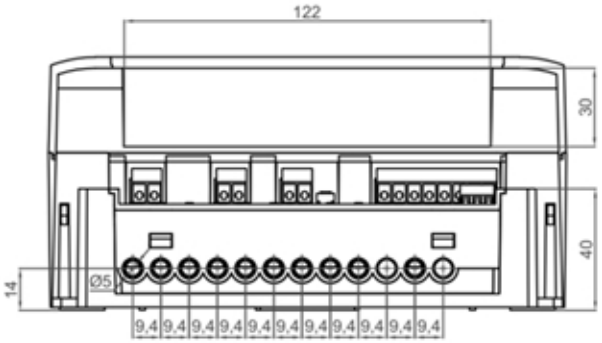
To manage the tariffs of the EWGE32xAxRx meters, you can use the built-in real-time clock and tariff calendar or an external tariff device (time switch).

Dimensions of the meter



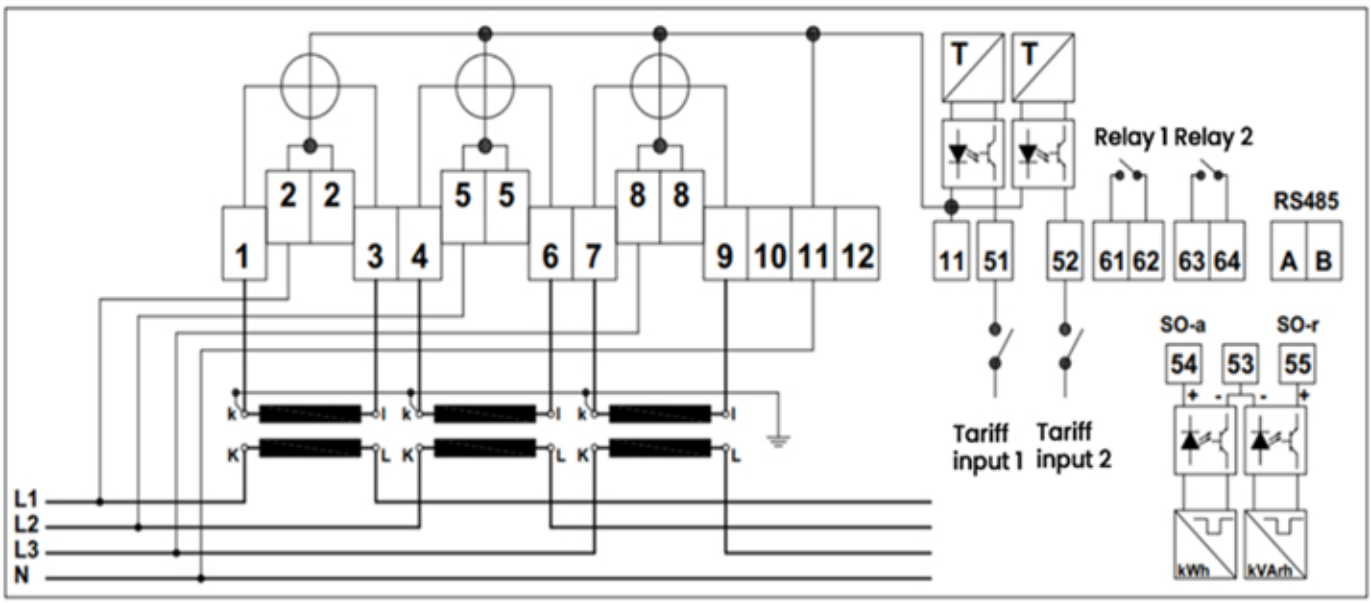
Label	dimensions in mm
b1	150
b2	175
b3	172.5
h1	152.5
h2	178
h3	250
h4	65
c	84.5

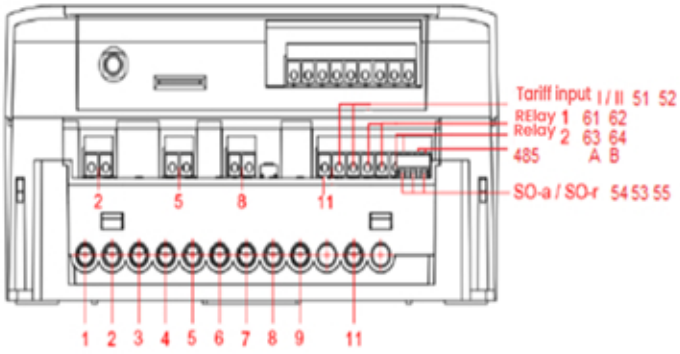


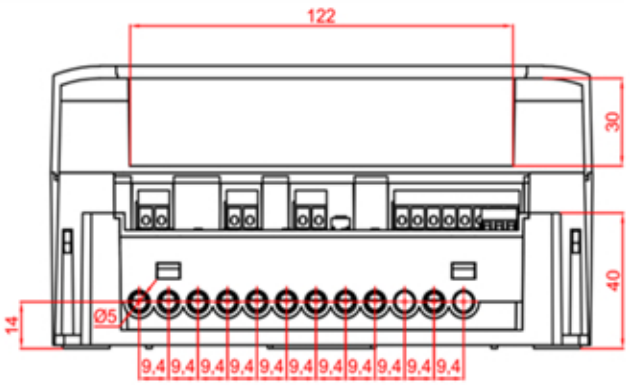


Connection		label
Tariff inputs	tariff input 1	51
	tariff input 2	52
Electrical test output	SO-a/SO-r positive	53
	SO-a/SO-r negative	54
REIay	Input	61
	Output	62
EXTERNAL SWITCH	Off	71
	Com	72
	On	73
	5v	74
RS485	input	A
	output	B

Wiring diagrams for meters







The EWGE32xAxRx meters are designed and manufactured in full compliance with EN50470-1 and EN50470-3 standards, as well as IEC62053-21, IEC62053-22, and IEC62053-23 standards.

A dedicated seven-segment LCD display fully complies with VDEW standards and is used to show measured and registered values in three operating modes: automatic, manual, and test mode.

The EWGE32xAxRx meters register and store profiles of measured and registered values, as well as logs of events relevant to the operation of the meter.

Technical specifications of the meter

Technical specifications	
Nominal voltage	3x230/400 V
Voltage range	$0.8U_n$ - $1.15U_n$
Nominal frequency	50 Hz
Reference current	5 A
Maximum current	6 A
Transient current	500 mA
Minimum current	250 mA
Start-up current	25 mA for Class 2 (A)
	20 mA for Class 1 (B)
Direction of energy	Imported/exported
Accuracy class	Active energy: B and C (EN50470 -1 i EN50470 -3) 0.5S and 1 (IEC62053-22)
	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 I (B)
Number of tariffs	up to 4
Optical output constant	1.000 impulses/kWh (kVArh)
Electrical output constant	500 impulses/kWh (kVArh)
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	IP52

Memory of profiled measured registered quantities	5 profiles, 10 channels
Profile of calculated quantities	24 records
Load profile	5760 records
Hourly value profile of c. q.	5760 records
Daily value profile of c.q.	1000 records
Profiled measured values	1000 records
Standard events logbook	1000 records
Electric power quality logbook	1000 records
Integrity breakdown logbook	1000 records
Power limitation logbook	1000 records
Communication events logbook	1000 records
Power cut events logbook	1000 records

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 symbolsL1, L2, L3
Indication of meter status	5 symbols
Display size period	Programmable 5 to 20 seconds

Communication of meters

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.

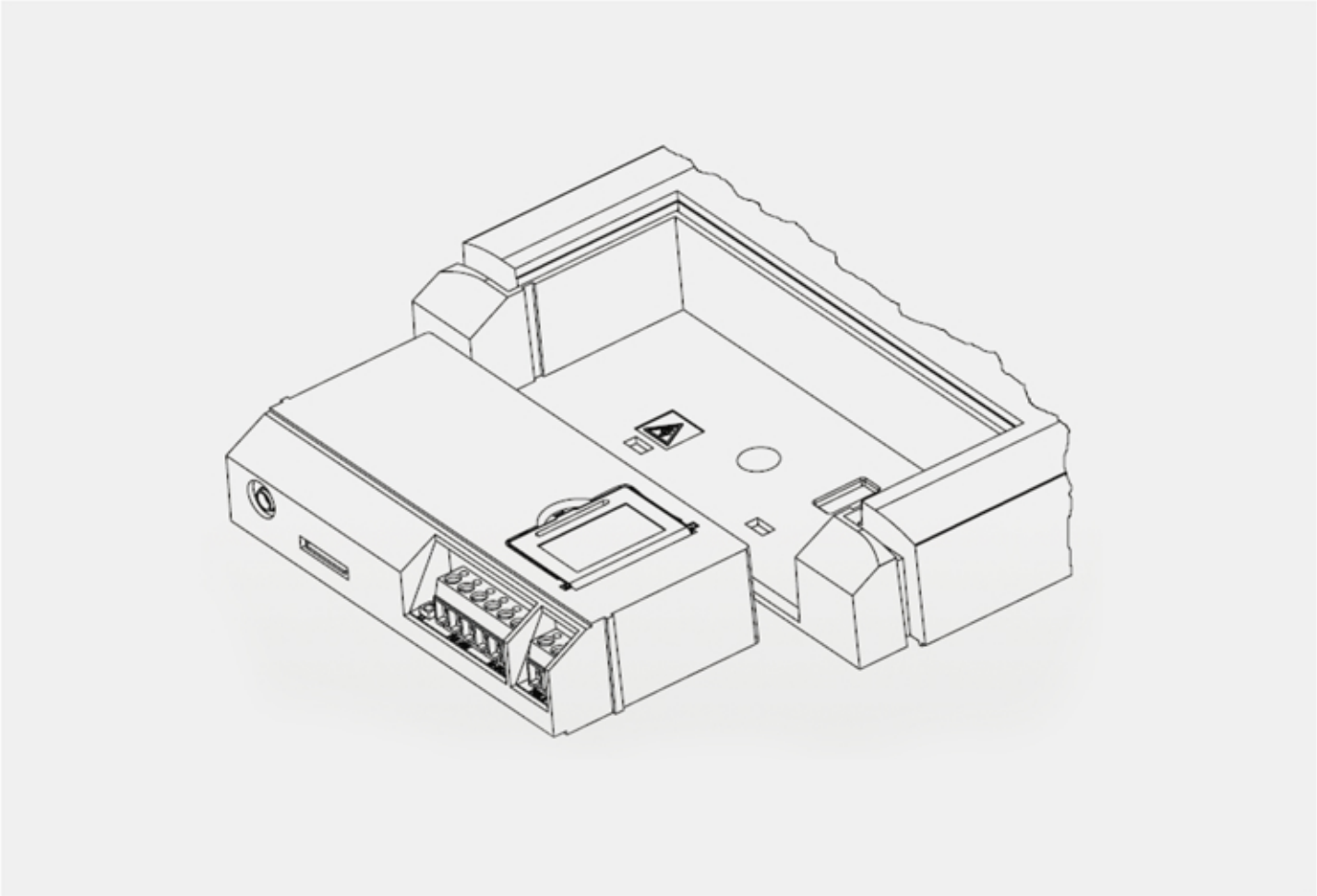
All EWG meters have the capability for PLUG-IN connection of external modules such as GPRS modem, PLC modem (S-FSK and OFDM modulation), RS485 module, and RF modem. The electrical interface is optically isolated.

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

Meter communication

	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								$\bar{S}$	
Processor	ARM with FO									
	ARM with GO									$\bar{P}$

EWG E300/E400 GPRS Modem



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. .

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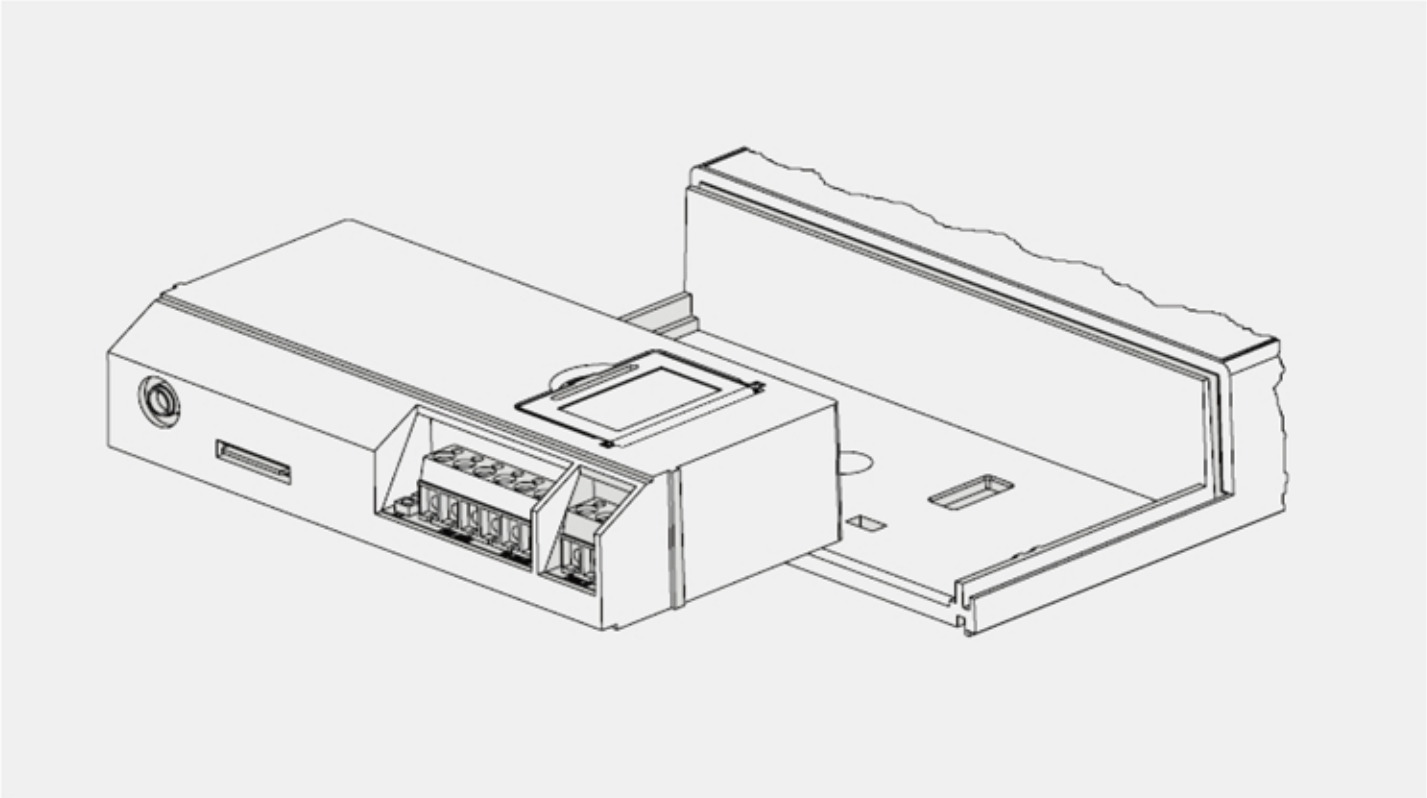
Connection	Label	Description
1		Not in use
2		Not in use
3	GND	GND input RS485
4	A	RS485 terminal A
5	B	RS485 terminal B
6	74	External switch power supply
7	71	OFF- external switch turned off
8	73	ON- external switch turned on
9	72	COM- common end for external switch

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 µA 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)

Connection	Label	Description
1	75	input 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	
Ilsolation		
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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