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LE-01MW v2
Electric energy meter,
1-phase,
2-wire, 4-tariff



Do not dispose of this device in the trash along with other waste!

According to the Law on Waste, electro coming from households free of charge and can give any amount to up to that end point of collection, as well as to store the occasion of the purchase of new equipment (in accordance with the principle of old-for-new, regardless of brand). Electro thrown in the trash or abandoned in nature, pose a threat to the environment and human health.



Compliance

MID Directive	2014/32/EU
Certificate	0120/SGS0571

Purpose

The LE-01MW v2 is an electronic, compliant with the MID Directive, single-phase electricity meter, designed for measurement in a 2-wire direct system.

The built-in real-time clock allows energy consumption to be measured with 4 tariff zones.

The meter is equipped with RS-485 communication interface with Modbus RTU protocol allowing remote reading and configuration of the meter.

Characteristic of the device

- » 1-phase energy meter;
- » Direct measurement up to 100 A;
- » DIN rail mounting (1 module);
- » Operate in one of two measurement modes:
 - measurement of imported and exported active energy;
 - measurement of imported and exported reactive energy;
- » Energy measurement in 4 tariff zones;
- » Built-in real time clock with battery backup to switch tariff zones;
- » Time schedules dividing the day into tariff zones;
- » It can settle energy according to schedules specific for business days and weekends;
- » Indication of network parameters;
- » Compliance with MID;
- » RS-485 port;
- » Modbus RTU protocol;
- » Backlit LCD display.

Functioning

The LE-01MW meter precisely measures the amount of consumed electricity under the influence of flowing current and applied voltage. Power consumption is indicated by the flashing LED. In addition, the meter measures the parameters of the supply network and the temperature of its own system. The values are indicated cyclically on the LCD display.

The display is active when the indicator power is on.

The meter operates in the communication network as a Slave device.

The communication takes place in accordance with the Modbus RTU standard via the RS-485 serial port. The read-out values of registers after conversion give results according to the indications on the indicator display.

Measured values

Active energy imported	AE+/AE-	[kWh]
Active energy exported		[kWh]
Reactive energy imported		[kvarh]
Reactive energy exported		[kvarh]
Phase voltage	U	[V]
Phase current	I	[A]
Frequency	F	[Hz]
Active power	P	[W]
Reactive power	Q	[var]
Apparent power	S	[VA]
Power factor	$\cos\varphi$	

Modbus registers

Description of measurement and configuration registers available on the website www.fif.com.pl (on the device's subpage).

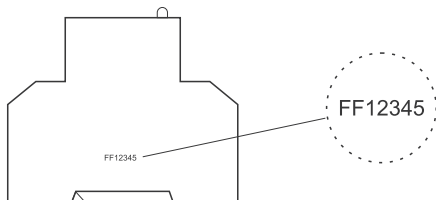
Meter address

Change of meter address is done via the RS-485 port using the Modbus RTU protocol command to set the desired value in the meter register.

The default meter address: 1.

Meter number

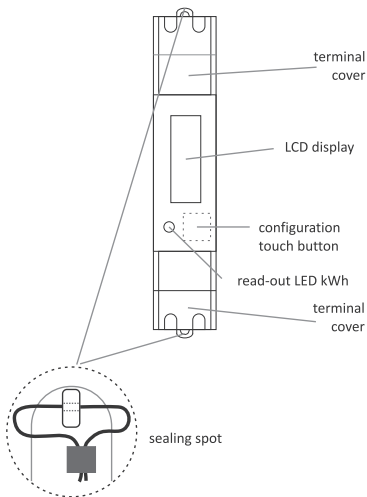
The meter is marked with individual serial number allowing its unambiguous identification. The marking is laser engraved and cannot be removed).



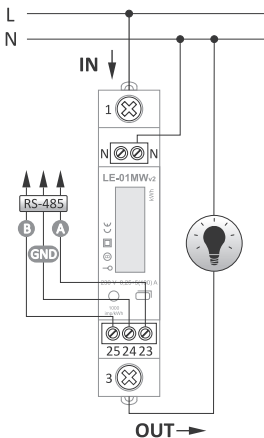
Sealing

The meter has sealable input and output terminal covers to prevent any attempts to bypass the meter.

Front panel



Wiring diagram



- 1 LIN power input
- 3 LOUT power output
- N N-wire neutral
- 23 RS-485 output (A)
- 24 RS-485 output (GND)
- 25 RS-485 output (B)

Data displayed on the LCD

The meter's display shows cyclically the following measured values:

Measured values			
No.	Function	Unit	Format
1	Total active energy	kWh	5+2 00000,00
2	Imported active energy	kWh	5+2 00000,00
3	Exported active energy	kWh	5+2 00000,00
4	Total reactive energy	kWh	5+2 00000,00
5	Additional meter (erasable) – active energy	kWh	5+2 00000,00
6	T1 total active energy	kWh	5+2 00000,00
7	T1 total reactive energy	kvar	5+2 00000,00
8	T2 total active energy	kWh	5+2 00000,00
9	T2 total reactive energy	kvar	5+2 00000,00
10	T3 total active energy	kWh	5+2 00000,00
11	T3 total reactive energy	kvar	5+2 00000,00
12	T4 total active energy	kWh	5+2 00000,00
13	T4 total reactive energy	kvar	5+2 00000,00

Measured values cont.

No.	Function	Unit	Format
14	Additional meter (erasable) – reactive energy	kvar	5+2 00000,00
15	Voltage	V	3+2 000.00
16	Current	A	3+2 000.00
17	Active power	W	5+0 00000
18	Reactive power	var	5+0 00000
19	Apparent power	VA	5+0 00000
20	Power factor	PF	1+2 0.00
21	Frequency	Hz	2+2 00.00
22	Imported active power demand	W	5+0 00000
23	Total imported active power demand	W	5+0 00000
24	Exported active power demand	W	5+0 00000
25	Total exported active power demand	W	5+0 00000
26	Imported reactive power demand	var	5+0 00000
27	Total imported reactive power demand	var	5+0 00000

Measured values cont.

No.	Function	Unit	Format
28	Exported reactive power demand	var	5+0 00000
29	Total exported reactive power demand	var	5+0 00000



The parameter is changed by default every 5 seconds or at the frequency set by the user and manually, using the button on the front of the casing of the meter.

Mounting

1. Disconnect the power supply.
2. Mount the indicator on the rail in the distribution box.
3. Connect the neutral wire to terminal N.
4. Connect the input phase to terminal 1.
5. Connect the measured circuit or single receiver to terminal 3 (output phase L) and to N.
6. Connect terminals 23, 24 and 25 to the RS-485 network..

Configuration

Configuration of the meter operation can be performed locally (button on the front of the meter) or remotely through the RS-485 port.

The description of the meter configuration is included in the full meter manual available at www.fif.com.pl on the product subpage.

LE Config service program

Program for test reading of the counted energy value and for basic settings of the meter parameters.

Available at www.fif.com.pl (on the device's subpage).

For communication of the meter with the computer, the USB CN-USB-485 converter or any RS-485/USB standard is required.

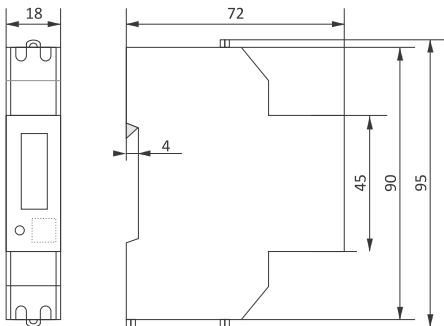
Technical data

device type	1-phase
installation	2-wire
rated voltage	230 V AC
minimum measured current	0.02 A
base current	0.25÷5 A
maximum current	100 A
voltage measuring range	100÷289 V AC
measurement accuracy (EN50470-1/3)	class B
rated frequency	50 Hz
insulation protection class	II
housing	PC material
overload	30×I _{max} /10 ms
insulation	4 kV/1 min.; 6 kV/1 μs
own power consumption	8 VA; 0,4 W
indication range	0÷99.999,99 kWh
constant	100, 1000, 2000 pulses/kWh
communication	
port	RS-485
communication protocol	Modbus RTU
transmission parameters	9600*, 19200, 38400, 57600, 115200 bps
parity	NONE*, ODD, EVEN

stop bits	1*/2
read-out signalling	red LED
working temperature	-25÷55°C
terminal	
100 A	25 mm ² screw terminals
RS-485	1 mm ² screw terminals
tightening torque	0.4 Nm
dimensions	1 module (18 mm)
mounting	on TH-35 rail
ingress protection	IP51

* factory settings

Dimensions



Warranty

F&F products are covered by a 24-month warranty from the date of purchase. The warranty is only valid with proof of purchase. Contact your dealer or contact us directly.

CE and MID declaration

F&F Filipowski sp. j. declares that the device is in conformity with the essential requirements of The Low Voltage Directive (LVD) 2014/35/EU and the Electromagnetic Compatibility (EMC) Directive 2014/30/UE.

The CE and MID Declaration of Conformity, along with the references to the standards in relation to which conformity is declared, can be found www.fif.com.pl on the product subpage.

General work safety conditions

- » Please read the instructions carefully before installation.
- » The device should be installed and operated by qualified personnel who are familiar with its design, operation, and associated risks.
- » Do not install a meter that is damaged or incomplete.
- » The user is responsible for proper grounding of the system, proper selection, installation, and efficiency of other devices connected to the meter, including safety devices such as over-current, residual current and overvoltage circuit breakers.
- » Before connecting the power supply, make sure that all cables are connected correctly.
- » It is essential to observe the operating conditions of the meter (supply voltage, humidity, temperature).
- » To avoid electric shock or damage to the meter, turn off the power supply whenever the connection is changed.
- » Do not make any changes to the unit yourself. Doing so can result in damage to or improper operation of the device, which in turn can pose a threat to people operating it. In such cases, the manufacturer is not responsible for the resulting events and may refuse the provided warranty in the event of a complaint.
- » Do not tighten the terminals without the wire inserted. This may damage the lift mechanism of the terminal or the plastic cover of this terminal.

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