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1-phase energy consumption meter
LE-01MR v.2

User manual

v. 1.0.0

Safety information regarding the use of the controller is indicated by the following symbols. All information and recommendations bearing these symbols must be strictly observed.

	Danger of electric shock.
	Potentially dangerous situation that could endanger operating personnel or damage the unit.
Information on the design, operation and handling of the controller is indicated by following symbols:	
	Important information, valuable tip.
	Practical advice, solution to the problem.
	Example of application or operation.

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Part 1. Purpose

The LE-01MR v2 is an electronic, legalized (MID declaration) AC electricity meter designed for direct current measurement in 2-wire system.

The meter provides 4-quadrant energy and power measurement as well as monitoring of many additional network parameters such as voltage, current, active power, reactive power, apparent power, frequency, power factor. The meter has additional, resettable active and reactive energy meters. The LE-01MR v.2 meter is also equipped with RS485 communication interface with Modbus RTU protocol support for remote meter reading and configuration. The touch button located on the front panel of the meter allows you to select the displayed parameter and change the meter settings. The backlit LCD display makes it easy to read the measured values. The meter is also equipped with auxiliary energy (active and reactive) consumption meters, operating independently from the main meter, which can be reset by the user.

Part 2. Operation

Under the influence of the flowing current and applied voltage, the meter measures precisely the energy consumption and many additional electrical parameters (power, voltage, current, frequency...). The meter records in non-volatile memory the total (*) consumption of active and reactive energy, imported and exported active and reactive energy and the maximum power demand. The other parameters indicated by the meter are temporary and show the current values of the measured parameters that are not written to non-volatile memory.

(*) The method of calculating the total energy consumption is set in the meter configuration. By default, total energy is the sum of energy imported and exported.

Part 3. Installation

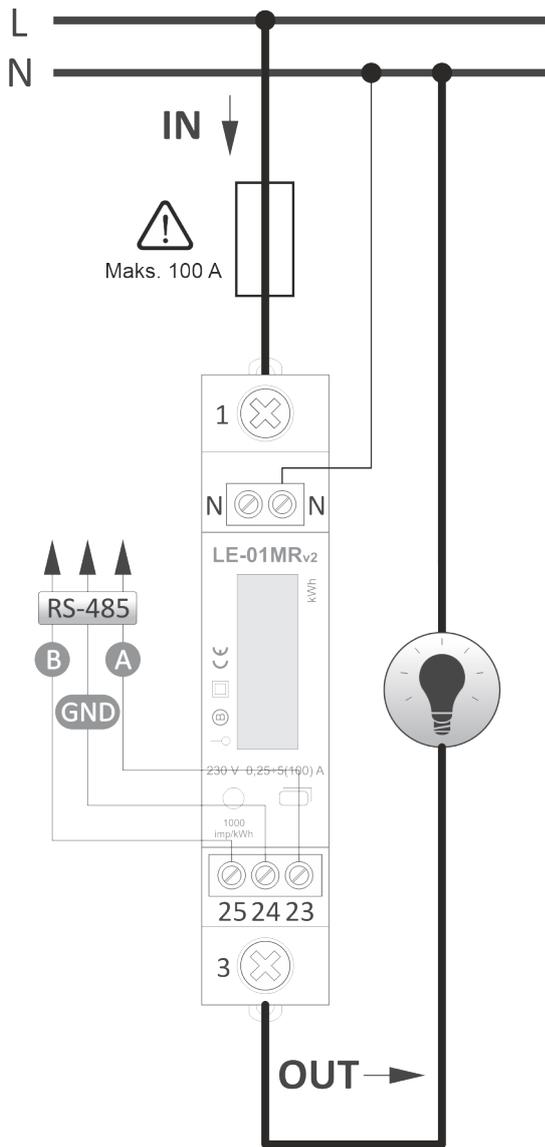
Security measures

	Installation of the device should be carried out by a qualified installers with knowledge and experience in the field of electrical installations. Please read the operating instructions before installation.	
	All installation work must be carried out with the supply voltage switched off. Ensure that the wires are carefully tightened – loose wires can lead to sparking, or in the extreme case to ignition of the device.	

Mounting

The meter should be connected to the electrical installation according to the following diagram.

	It is recommended to protect the current circuit of the meter with a fuse with a level of protection adapted to the level of load current, but not exceeding the maximum current of the meter (100 A).															
	<p>The diameter of the wires must be adapted to the value of the currents flowing through the current circuit of the meter (terminals 1 – 3). The minimum recommended diameter of current wires is 4 mm², the maximum (with sleeve) is 25 mm². Approximate diameters of the wires depending on the load current are presented in the table below:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Cross-section [mm²]</th> <th>Load capacity [A]</th> </tr> </thead> <tbody> <tr> <td>2.5</td> <td>26</td> </tr> <tr> <td>4.0</td> <td>34</td> </tr> <tr> <td>6</td> <td>44</td> </tr> <tr> <td>10</td> <td>61</td> </tr> <tr> <td>16</td> <td>82</td> </tr> <tr> <td>25</td> <td>108</td> </tr> </tbody> </table>	Cross-section [mm ²]	Load capacity [A]	2.5	26	4.0	34	6	44	10	61	16	82	25	108	
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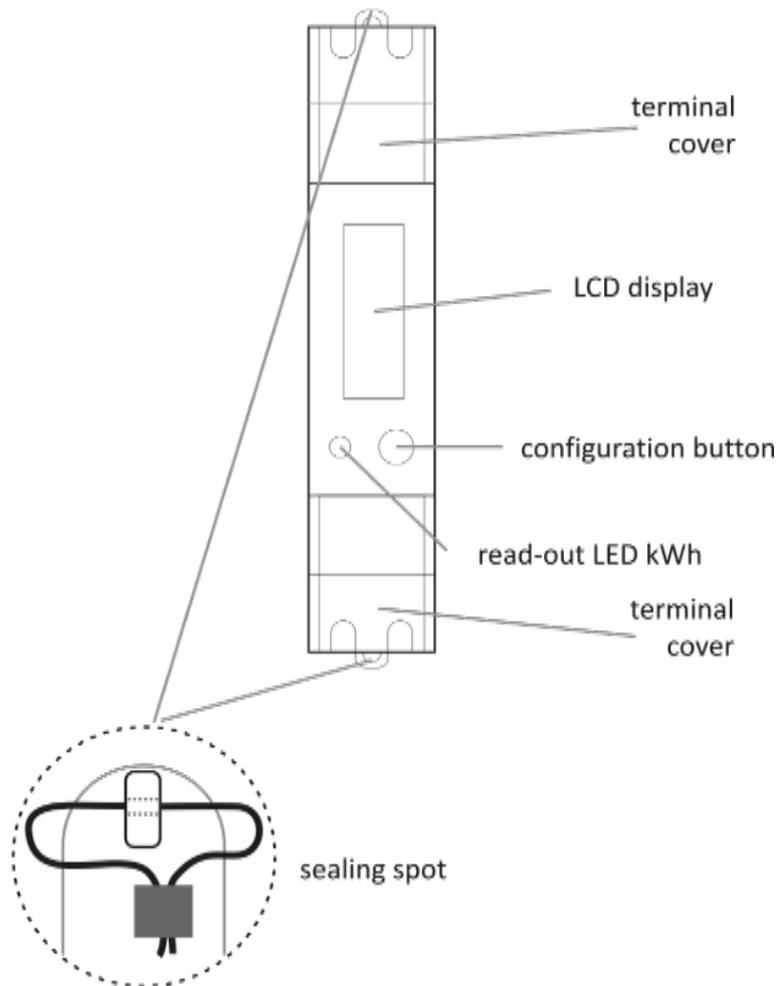


Functions of the meter terminals

1	Meter current input – connection of the phase wire of the power supply line. High current cable
3	Current output - phase wire output to supply power to the receiver. High current cable
N	Neutral wire input. This connection is only used to supply the meter and to measure the voltage, therefore a large diameter cable is not required.
23	Modbus RS-485 communication output – line A
25	Modbus RS-485 communication output – line B
24	Ground (GND) of the RS-485 communication interface.

Sealing

After connecting the meter, access to its terminals can be secured with seals connecting the meter body to the terminal covers.



Security seals are not provided with the meter.



Part 3. Usage

Direct reading of the measured values and configuration of the meter can be accessed via the controls on the front panel of the display.

<p>The diagram shows the front panel of the LE-01MR v2 meter. At the top, there are terminals labeled '1' and 'N'. Below them is the meter model 'LE-01MR v2' and a small LCD display showing '000000'. To the left of the display is a 'Pulse indicator' LED. Below the display is a 'Button'. At the bottom, there are terminals labeled '25 24 23' and '3'. The meter is rated for '230 V 0.25+5(100) A' and '1000 imp/kWh'.</p>	<p>Reading field – LCD digital indicator displaying the value of the measured parameter.</p> <p>Button – touch button. A short press of the button switches the view to the next displayed parameter. Long press activates the meter configuration mode.</p> <p>Pulse indicator – the blinks of this LED correspond to the registered increase in active energy consumption. A single blink is equivalent to the consumption of 1 Wh of energy (1000 pulses = 1 kWh).</p>
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Measurements displayed on the LCD screen

The LE-01MR v.2 meter allows you to display many values measured and registered by the meter. Switching to the next parameter is done by short pressing the button located on the front panel of the meter. By default, the meter is also configured to cycle between measured values.

The list of measurements available from the LCD display is summarized in the table below.

No.	Feature	Format	Unit	Symbol on screen
1	Total active energy	00000.00 (5+2)	kWh	$\Sigma^{+-\Delta}$ kWh
2	Active energy imported	00000.00 (5+2)	kWh	Σ^{+} kWh
3	Active energy exported	00000.00 (5+2)	kWh	Σ^{-} kWh
4	Total reactive energy	00000.00 (5+2)	kvarh	$\Sigma^{+-\Delta}$ kVArh
5	Inductive reactive energy imported	00000.00 (5+2)	kvarh	Σ^{+} kVArh
6	Inductive reactive energy exported	00000.00 (5+2)	kvarh	Σ^{-} kVArh
7	Resettable auxiliary active energy meter	00000.00 (5+2)	kWh	reset /

				$\Sigma^{+-\Delta}$ kWhz
8	Resettable auxiliary reactive energy meter	00000.00 (5+2)	kvarh	reset / $\Sigma^{+-\Delta}$ kVArhz
9	Voltage	000.00 (3+2)	V	$\Sigma^{+-\Delta}$ VArhz
10	Current	000.00 (3+2)	A	$\Sigma^{+-\Delta}$ kVAhz
11	Active power	00000 (5+0)	W	$\Sigma^{+-\Delta}$ kWhz
12	Reactive power	00000 (5+0)	var	$\Sigma^{+-\Delta}$ kVArhz
13	Apparent power	00000 (5+0)	VA	$\Sigma^{+-\Delta}$ kVAhz
14	Power factor	0.00 (1+2)	-	PF
15	Frequency	00.00 (2+2)	Hz	$\Sigma^{+-\Delta}$ kVAhz
16	Demand for imported active power	00000 (5+0)	W	d + $\Sigma^{+-\Delta}$ kWhz
17	Maximum demand for imported active power	00000 (5+0)	W	P + $\Sigma^{+-\Delta}$ kWhz
18	Demand for exported active power	00000 (5+0)	W	d + $\Sigma^{+-\Delta}$ kWhz
19	Maximum demand for exported active power	00000 (5+0)	W	P + $\Sigma^{+-\Delta}$ kWhz
20	Demand for imported reactive power	00000 (5+0)	var	d + $\Sigma^{+-\Delta}$ kVArhz
21	Maximum demand for imported reactive power	00000 (5+0)	var	P + $\Sigma^{+-\Delta}$ kVArhz
22	Demand for exported reactive power	00000 (5+0)	var	d + $\Sigma^{+-\Delta}$ kVArhz
23	Maximum demand for exported reactive power	00000 (5+0)	Var	P + $\Sigma^{+-\Delta}$ kVArhz



The time for which a single parameter is displayed on the screen can be set in the range of 0 - 99 seconds directly from the meter settings or via the RS-485 interface.



Preview of the meter settings

By pressing the button on the front panel of the meter for three seconds, a menu will be displayed that allows you to read the current meter settings. In order to switch the view to the next parameter, short press the button on the meter panel.

No.	Feature	Value										
1	Setup											
2	Number of the meter	000000000000										
3	Meter address in the RS-485 network	1 (default) – 247										
4	Baud rate	6 – 9600 bps (default) 7 – 19200 bps 8 – 38400 bps 9 – 57600 bps 10 – 76800 bps 11 – 115200 bps										
5	Parity	0 – None (default) 1 – Odd 2 – Even										
6	Number of stop bits	Stop 1 – 1 (default) Stop 2 – 2										
7	Parameter display time	Lcd xx, where xx is the time after which the meter view will automatically switch to display the next parameter. A value of 0 stops automatic switching.										
8	Calculation of total energy consumption	A parameter that shows how the total energy consumption reading is obtained: <table border="1" data-bbox="683 1644 1481 2020"> <thead> <tr> <th>Value</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Total energy = Import (energy imported)</td> </tr> <tr> <td>2</td> <td>Total energy = Export (energy exported)</td> </tr> <tr> <td>3</td> <td>Total energy = Import + Export</td> </tr> <tr> <td>4</td> <td>Total energy = Import - Export</td> </tr> </tbody> </table>	Value	Operation	1	Total energy = Import (energy imported)	2	Total energy = Export (energy exported)	3	Total energy = Import + Export	4	Total energy = Import - Export
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1	Total energy = Import (energy imported)											
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		The default value is 3.
9	The period of calculating power demand	Length of time interval (in minutes) from which the value of power demand will be calculated. The parameter is set in the range from 1 to 30 minutes, the default value is 15 minutes.
10	System software version	
11	Software checksum	
 To exit the settings preview menu, press and hold the button on the front of the device until the previous measurement is displayed.		

Meter configuration

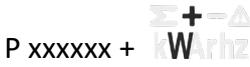
The operating parameters of the meter can be configured directly from the meter (using the display and a button on the front of the device), or remotely using the RS-485 interface and the Modbus RTU protocol. Access to the configuration from the meter can be secured with a PIN number.

To enter the configuration of the LE-01MR v.2 meter you should:

- press and hold down (for approx. 3 seconds) the button on the front of the meter until the **Setup** message is displayed;
- press and hold the button again until the field for entering the PIN number is displayed (initially it is only zeroes);
- the blinking character indicates which digit of the PIN number is currently being edited;
- set the set value of the edited digit with short presses of the button;
- confirmation of the digit value is done by long pressing the button, after which the edit indicator will be moved to the next digit;
- set and confirm all digits of the PIN number in the same way,
- If the PIN number is entered incorrectly, an error message is displayed on the screen and the operation must be repeated from the beginning.

	The default PIN number is set to 0000 .	
	If the set PIN number is lost, access to the configuration, including recovery of the PIN number, is available via the RS-485 communication interface.	

- after passing the PIN verification, the first of the available configuration parameters - **Id** address of the meter in the RS-485 network - is displayed;
- the transition between the parameters is made by short pressing the button, long pressing takes you to the edition of the selected parameter;
- the parameter is set by short presses of the button, a long press of the button confirms the new value.

No.	Configuration parameters	Value
1	Meter address in the RS-485 network	1 (default) – 247
2	Baud rate	6 – 9600 bps (default) 7 – 19200 bps 8 – 38400 bps 9 – 57600 bps 10 – 76800 bps 11 – 115200 bps
3	Parity	0 – None (default) 1 – Odd 2 – Even
4	Number of stop bits	Stop 1 – 1 (default) Stop 2 – 2
5	Resetting the auxiliary active energy meter	The display cyclically shows the reset text and the current value of the auxiliary meter. Press and hold down the button on the front of the meter to reset the indication.
6	Resetting the auxiliary reactive energy meter	The display cyclically shows the reset text and the current value of the auxiliary meter. Press and hold down the button on the front of the meter to reset the indication.
7	Resetting the maximum active power demand indicator	The registered value of the maximum active power demand appears on the display as <div style="text-align: center;">  </div> Press and hold down the button on the front of the meter to reset the indication.

8	Resetting the maximum active power consumption indicator	<p>The registered value of the maximum active power demand appears on the display as</p> <p style="text-align: center;">P xxxxxx + </p> <p>Press and hold down the button on the front of the meter to reset the indication.</p>										
9	Setting the display time of a parameter	<p>Lcd xx, where xx is the time after which the meter view will automatically switch to display the next parameter. Setting range 0 – 99 Seconds. A value of 0 stops automatic switching.</p>										
10	Setting the period for power demand calculation	<p>Length of time interval (in minutes) from which the value of power demand will be calculated.</p> <p>The parameter is set in the range from 1 to 30 minutes, the default value is 15 minutes.</p>										
11	Calculation of total energy consumption	<p>A parameter that determines how the total energy consumption reading is obtained:</p> <table border="1" data-bbox="681 956 1479 1330"> <thead> <tr> <th>Value</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Total energy = Import (energy imported)</td> </tr> <tr> <td>2</td> <td>Total energy = Export (energy exported)</td> </tr> <tr> <td>3</td> <td>Total energy = Import + Export</td> </tr> <tr> <td>4</td> <td>Total energy = Import - Export</td> </tr> </tbody> </table> <p>The default value is 3.</p>	Value	Operation	1	Total energy = Import (energy imported)	2	Total energy = Export (energy exported)	3	Total energy = Import + Export	4	Total energy = Import - Export
Value	Operation											
1	Total energy = Import (energy imported)											
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3	Total energy = Import + Export											
4	Total energy = Import - Export											
12	Setting up the PIN number	<p>You can set your own code to secure access to the meter configuration.</p> <table border="1" data-bbox="681 1512 1479 1720"> <tr> <td data-bbox="681 1512 793 1720" style="text-align: center;"></td> <td data-bbox="796 1512 1364 1720"> <p>The PIN code restricts access to the meter configuration through the meter control panel. Access via the RS-485 communication port is not blocked.</p> </td> <td data-bbox="1367 1512 1479 1720" style="text-align: center;"></td> </tr> </table>		<p>The PIN code restricts access to the meter configuration through the meter control panel. Access via the RS-485 communication port is not blocked.</p>								
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Part 4. RS-485 communication

The meter is equipped with a RS-485 communication interface that supports the Modbus RTU protocol.

Default communication settings

No.	Parameter	Default value:
3	Meter address in the RS-485 network	1
4	Baud rate	9600 bps
5	Parity	None
6	Number of stop bits	1

List of the measurement registers

All measurement results are read-only. Data reading, according to Modbus RTU protocol, is carried out using the **Read Holding Register** command (command code 0x03).

Data format:

INT32 – 32-bit signed integer

INT16 – 16-bit signed integer

	<p>The data is encoded as an integer. To obtain the actual value of the measured data, multiply the read value by the multiplier given in the table below.</p> <p>Example:</p> <p>The register with the voltage value has the value of 241700. To obtain the correct value in V, perform the following action: $241700 * 0.001 = 241,700 \text{ V}$</p>	
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No.	Parameter	Address		R/W	Num-ber of regis-ters	Format	Unit	Multi-plier
		HEX	DEC					
1	Voltage	0x100	256	R	2	INT32	V	0.001
2	Current	0x102	258	R	2	INT32	A	0.001
3	Active power	0x104	260	R	2	INT32	W	1

4	Apparent power	0x106	262	R	2	INT32	VA	1
5	Reactive power	0x108	264	R	2	INT32	Var	1
6	Frequency	0x10A	266	R	1	INT16	Hz	0.1
7	Power factor	0x10B	267	R	1	INT16	-	0.001
8	Total consumed (imported) active energy	0x10E	270	R	2	INT32	kWh	0.01
9	Total returned (exported) active energy	0x118	280	R	2	INT32	kWh	0.01
10	Total active energy	0x122	290	R	2	INT32	kWh	0.01
11	Total consumed (imported) reactive energy	0x12C	300	R	2	INT32	kvarh	0.01
12	Total returned (exported) reactive energy	0x136	310	R	2	INT32	kvarh	0.01
13	Total reactive energy	0x140	320	R	2	INT32	kvarh	0.01
14	Total reactive energy in the first quadrant	0x14A	330	R	2	INT32	kvarh	0.01
15	Total reactive energy in the second quadrant	0x154	340	R	2	INT32	kvarh	0.01
16	Total reactive energy in the third quadrant	0x15E	350	R	2	INT32	kvarh	0.01
17	Total reactive energy in the fourth quadrant	0x168	360	R	2	INT32	kvarh	0.01
18	Resettable auxiliary active energy meter	0x172	370	R	2	INT32	kWh	0.01
19	Resettable auxiliary reactive energy meter	0x174	372	R	2	INT32	kvarh	0.01
20	Consumed (imported) active power demand	0x176	374	R	2	INT32	W	0.1
21	Maximum consumed (imported) active power demand	0x178	376	R	2	INT32	W	0.1
22	Returned (exported) active power demand	0x17A	378	R	2	INT32	W	0.1
23	Maximum returned (exported) active power demand	0x17C	380	R	2	INT32	W	0.1

24	Consumed (imported) reactive power demand	0x180	384	R	2	INT32	var	0.1
25	Maximum consumed (imported) reactive power demand	0x182	386	R	2	INT32	var	0.1
26	Returned (exported) reactive power demand	0x184	388	R	2	INT32	var	0.1
27	Maximum returned (exported) reactive power demand	0x186	390	R	2	INT32	var	0.1

List of the configuration registers

To write configuration data to the LE-01MR v.2 meter you can use commands with codes:

- **0x06 – Write Single Register**
- **0x10 – Write Multiple Register**

	If a parameter is written to more than one register, then writing to this parameter must be done using the Write Multiple Register command and it must include all registers of the parameter being edited once.	
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	For remote configuration of the meter, it is recommended to use the free LE Config software (for PCs with the Windows operating system), available on the www.fif.com.pl page on the product subpage.	
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No.	Parameter	Address		R/W	Number of registers	Description
		HEX	DEC			
1	Serial number of the meter	0x1000	4096	R/W	6	12-digit meter identification number. The number is stored as a BCD number. For example, a hexadecimal number in the form 0x123456789012 indicates a meter with the serial number 123456789012
2	MODBUS address	0x1003	4099	R/W	1	Meter address in the Modbus RTU network. Values between 1 and 247 are allowed.

3	Software version	0x1004	4100	R	1	Values indicate the version of the meter and control software.										
4	Electronics version	0x1005	4101	R	1											
5	CRC checksum	0x1006	4102	R	1											
6	Parameter display time	0x100B	4107	R/W	1	Time encoded in seconds. Setting range 0 - 99 seconds, a value of 0 means that the automatic switching of the parameter view stops.										
7	RS-485 - communication rate	0x100C	4108	R/W	1	The communication rate is encoded in numerical form, according to the following table: <table border="1" data-bbox="1023 813 1481 1189"> <thead> <tr> <th>Value</th> <th>Bitrate</th> </tr> </thead> <tbody> <tr> <td>6</td> <td>9600 bps</td> </tr> <tr> <td>7</td> <td>19200 bps</td> </tr> <tr> <td>8</td> <td>38400 bps</td> </tr> <tr> <td>9</td> <td>115200 bps</td> </tr> </tbody> </table>	Value	Bitrate	6	9600 bps	7	19200 bps	8	38400 bps	9	115200 bps
Value	Bitrate															
6	9600 bps															
7	19200 bps															
8	38400 bps															
9	115200 bps															
9	RS-485 – parity check	0x100D	4109	R/W	1	<table border="1" data-bbox="1023 1200 1481 1507"> <thead> <tr> <th>Value</th> <th>Settings</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>None</td> </tr> <tr> <td>1</td> <td>Odd</td> </tr> <tr> <td>2</td> <td>Even</td> </tr> </tbody> </table>	Value	Settings	0	None	1	Odd	2	Even		
Value	Settings															
0	None															
1	Odd															
2	Even															
10	RS-485 – number of stop bits	0x100E	4110	R/W	1	<table border="1" data-bbox="1023 1518 1481 1749"> <thead> <tr> <th>Value</th> <th>Settings</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1 – stop bit</td> </tr> <tr> <td>2</td> <td>2 – stop bits</td> </tr> </tbody> </table>	Value	Settings	1	1 – stop bit	2	2 – stop bits				
Value	Settings															
1	1 – stop bit															
2	2 – stop bits															
11	Calculation of total energy consumption	0x100F	4111	R/W	1	The total energy is equal to: <table border="1" data-bbox="1023 1821 1481 2018"> <thead> <tr> <th>Value</th> <th>Settings</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Energy consumed (import)</td> </tr> </tbody> </table>	Value	Settings	1	Energy consumed (import)						
Value	Settings															
1	Energy consumed (import)															

						<table border="1"> <tr> <td>2</td> <td>Energy returned (export)</td> </tr> <tr> <td>3</td> <td>Import + Export</td> </tr> <tr> <td>4</td> <td>Import- Export</td> </tr> </table>	2	Energy returned (export)	3	Import + Export	4	Import- Export
2	Energy returned (export)											
3	Import + Export											
4	Import- Export											
12	Calculating power demand	0x1010	4112	R/W	1	<table border="1"> <thead> <tr> <th>Value</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Power demand is calculated on the basis of successive, full time intervals</td> </tr> <tr> <td>1</td> <td>Power demand calculated on the basis of the moving average over a given period of time</td> </tr> </tbody> </table>	Value	Operation	0	Power demand is calculated on the basis of successive, full time intervals	1	Power demand calculated on the basis of the moving average over a given period of time
Value	Operation											
0	Power demand is calculated on the basis of successive, full time intervals											
1	Power demand calculated on the basis of the moving average over a given period of time											
13	The period of calculating power demand	0x1011	4113	R/W	1	Value in minutes. Setting range from 1 to 30 minutes.						
14	Configuration of the measured values indicated on the display	0x1012	4114	R/W	4	<p>Parameter that allows you to limit the number of measured values visible on the LCD.</p> <p>Each parameter corresponds (in order as shown in the LCD description table) to one bit of that parameter. Bit set to 1 means the measurement is visible on the LCD, bit set to 0 means the parameter is not visible.</p> <p>Note: the data is stored in the two upper registers (0x1014-0x1015).</p> <p>Note: If the entire parameter is reset, no values will be displayed on the meter screen.</p>						
15	PIN	0x1016	4118	R/W	1	The PIN code restricts access to the						

						meter configuration through the panel on the front of the meter.										
16	Auxiliary energy meter reset	0x2002	8194	R/W	1	<table border="1"> <thead> <tr> <th>Value</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>0x2000</td> <td>Active energy meter reset</td> </tr> <tr> <td>0x4000</td> <td>Reactive energy meter reset</td> </tr> <tr> <td>0x6000</td> <td>Active and reactive energy meter reset</td> </tr> </tbody> </table>	Value	Operation	0x2000	Active energy meter reset	0x4000	Reactive energy meter reset	0x6000	Active and reactive energy meter reset		
						Value	Operation									
						0x2000	Active energy meter reset									
						0x4000	Reactive energy meter reset									
0x6000	Active and reactive energy meter reset															
17	Power demand meters reset	0x2003	8195	R/W	1	<p>To reset the selected power demand value, enter one of the following values into the register</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>0xA501</td> <td>Demand for active power</td> </tr> <tr> <td>0xA502</td> <td>Demand for reactive power</td> </tr> <tr> <td>0xA504</td> <td>Maximum active power demand</td> </tr> <tr> <td>0xA508</td> <td>Maximum reactive power demand</td> </tr> </tbody> </table>	Value	Operation	0xA501	Demand for active power	0xA502	Demand for reactive power	0xA504	Maximum active power demand	0xA508	Maximum reactive power demand
						Value	Operation									
						0xA501	Demand for active power									
						0xA502	Demand for reactive power									
						0xA504	Maximum active power demand									
0xA508	Maximum reactive power demand															

Part 8. Technical data

Installation		2-wire
Rated voltage		230 V AC
Current	minimum	0.02 A
	base	5 A
	maximum	100 A
Voltage measurement range		100 – 289 V AC
Accuracy of measurement (EN50470-1)		Class B
Rated frequency		50 Hz
Insulation protection class		Class II
Housing		PC material
Meter power consumption		10 VA, 1 W
Meter display range		0 – 99999.99 kWh
Display		7-digit, LCD backlit (blue)
Meter constant		1000 pulse/kWh
Communication		
interface		RS-485
communication protocol		Modbus RTU
Modbus address		1 ^(*) - 245
baud rate		9600 ^(*) , 19200, 38400, 115200 bps
parity control		None ^(*) , Even, Odd
stop bits		1
Energy reading indication		LED, red
Operating temperature		-25 ÷ +55 °C

Terminal	
100 A current circuits (terminals 1, 3)	25 mm ² screw terminals
neutral wire (terminals N)	1 mm ² screw terminals
communication (terminals 23, 24, 25)	1 mm ² screw terminals
Dimensions	1 module (18 mm)
Installation	on TH-35 rail
Ingress protection	IP40

(*) Factory setting

Part 9. History of changes

Date	Version	Description
2022.09.12	1.0.0	First version of the manual

Part 10. WARRANTY

1. The meter is covered by a 24-month warranty. The warranty period is measured from the moment of the purchasing of the device.
2. The warranty is valid only with proof of purchase.
3. A warranty claim should be submitted at the point of purchase or directly to the manufacturer:

F&F Filipowski sp. j.
ul. Konstantynowska 79/81
95-200 Pabianice
Phone (42) 227-09 71
e-mail: dztech@fif.com.pl

4. The complaint should be accompanied by written information about the nature of the fault and the circumstances in which it occurred.
5. F&F Filipowski sp. j. makes a commitment to process complaints in accordance with the provisions of Polish law.
6. The choice of the way in which the complaint will be settled: the replacement of the faulty goods with the defect-free, repair or refund belongs to the manufacturer.
7. The warranty does not cover:
 - a. Mechanical and chemical damage
 - b. Damage caused by improper use or use not in accordance with the operating instructions
 - c. Post-sale damage resulting from accidents or other events for which the manufacturer or the point of sale is not responsible, such as damage during transport.
8. The warranty does not cover activities that according to the instructions should be performed by the user, such as installation of the multimeter, electrical installation, installation of other required electrical protection.
9. The guarantee shall not limit the rights of the buyer arising from the non-conformity of the goods with the contract.

Part 11. CE declaration

F&F Filipowski sp. j. declares that the XXX 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 MID and CE Declaration of Conformity, along with the references to the standards in relation to which conformity is declared, can be found at www.fif.com.pl on the product page.