



MODBUS ENERGY

Wi-Modbus-D

Integrator of
energy meters



www.fif.com.pl/fox/modbusenergy



F&F Filipowski L.P.; Konstantinowska 79/81, 95-200 Pabianice, POLAND
www.fif.com.pl; e-mail: biuro@fif.com.pl

Application

- » Integration of F&F energy meters with Modbus RTU interface into the Fox system;
- » Extend the functionality of existing energy meters to record and visualise energy consumption and electrical network parameters;
- » Current measurement of energy and power consumption as well as current and voltage values;
- » Use of recorded measurements to detect voltage or power consumption exceedances.

Characteristic

- » Monitoring of all relevant electrical network parameters;
- » Recording of average, minimum and maximum values;
- » High measurement accuracy guaranteed by the use of certified energy meters (MID);
- » 1 energy meter can be connected to each Modbus Energy device;
- » Access to measurement history via app or web browser;
- » Communication via home Wi-Fi network and remote access via the F&F Polish cloud;
- » Free mobile apps for Android and iOS;
- » Fully Polish solution focused on security and user privacy;
- » No hidden running costs and guaranteed long-term product support;
- » Installation in a switchbox (DIN rail), only one field in the switchboard required;
- » Direct 230 V AC power supply.

Configuration

For the initial configuration of the Fox module, it is necessary to download and run the free Fox application available for mobile devices running the system:

- » Android, version 8.0 or higher;
- » iOS, version 13 or higher.

You can download the app directly from the stores:



or via the website:

www.fif.com.pl/fox

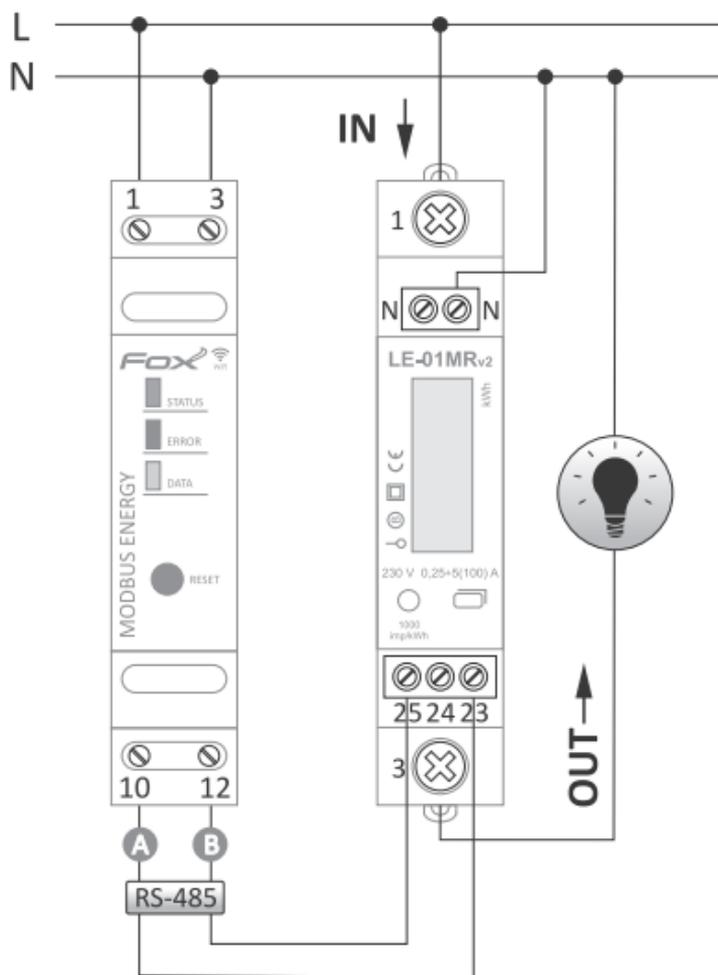


On the above page, you can also find detailed information on how to configure and operate the devices and the Fox mobile app.

Wiring diagram



One Modbus Energy integrator can only be connected to one energy meter.





The connection scheme depends on the type of meter to be connected. Each time, the A-B communication outputs of the Modbus Energy integrator must be connected together with the A-B communication outputs of the energy meter. Example connection diagrams for all supported energy meters are available on the product page: www.fif.com.pl/fox/modbusenergy.

Terminals description

No.	Function	Description
1	L	230 V power supply (phase wire)
3	N	230 V power supply (neutral wire)
10	A	RS-485 communication – output A
12	B	RS-485 communication – output B



Connecting the 230V power supply to the communication outputs A or B may lead to complete destruction of the integrator and the meter connected to it.



If the distance between the integrator and the energy meter is large (more than 10÷15 m), when planning the connection between these devices, it is advisable to read the document on good practice in the installation of RS-485 networks and follow the tips found there. The document can be downloaded from www.fif.com.pl.

Communication networks – technical presentation



First launch

After connecting the device to the power supply, it is recommended to personalize the device.

Personalization is the process of assigning passwords to access the device and setting up a connection to the home Wi-Fi network and (optionally) remote access to the device via the F&F cloud.



Configuration of remote access is necessary to record measurement results.



Do not leave the device switched on without performing the personalization. There is a risk that another user of the Fox application will gain access to your device. If you lose access to your Fox device, follow the procedure described in **Restore factory settings** section.



For a detailed description of how to use the Fox application, see the context-sensitive help for the application (available under the „i” key in the mobile application) or go to www.fif.com.pl/fox/modbusenergy.

1. Start the Fox application.
2. Open the program menu (≡ symbol in the upper left corner of the screen) and select the **Start** command.
3. In the system selection window, press the wireless system icon  and follow the directions in the following screens:

– **Remote access**

Remote access configuration is necessary when you need to be able to access and control your Fox devices from outside your home when your phone app and Fox modules are not connected to the same local network. If you do not have a remote access account, create one by pressing **Create Account** button and following the instructions displayed by the application. If you are adding an existing account to the application, you need to enter its parameters into the application: email address used to create an account in the cloud and a password to access the cloud and add more devices. In the first field (**Name**), enter the name under which the account will be displayed in the application. After entering the data, press the **Add** button.



Adding an account is a one-time action. The created account is visible in the list at the bottom of the screen and can be used to personalize subsequent devices. In this case, you can skip the **Remote Access** screen by pressing the **Next** button.



Remote access can be set independently for each device in a further customization step. Lack of remote access does not block the functionality of the device, it can still be accessed within the local Wi-Fi network.

– **Password manager**

Each Fox device allows you to enter two passwords: an administrator who has full configuration and device control rights, and a user who can control devices but without access to configuration settings.

First, add passwords to the password manager. One or two predefined passwords are then substituted for the personalized controllers. To add a new password to the password manager, you must:

- › In the **Enter name** field enter a description of the password under which it will be visible on the device manager list (such as Home administrator, living room user),
 - › In the **Enter password** field, enter the content of the password,
 - › Press the **Add** button.
-



The password is the key to access the device. Devices can be grouped using the same passwords, and permissions to these groups can be delegated in the form of an assigned access password. This way, by deciding which passwords go to which users, you can freely manage access to devices.



For more information on the role of passwords and their use in user management, go to: www.fif.com.pl/fox.



To remove user rights to a selected device, change the access passwords on it.



Deleting a password from the **Password Manager** will lose access to all devices using the deleted password.

– **Search**

Based on the previously entered information (remote access and password list), the application will start searching for devices.



Before you start searching, you need to enable the Bluetooth function on your phone and agree to access the location. This will allow you to directly search for nearby Fox devices.

The app searches for:

- › available devices nearby that are in factory mode;
- › devices available on your local network or connected to cloud accounts for which passwords were previously entered into **Password Manager**.



The gray icon and gray device description indicate devices detected nearby via a Bluetooth connection. To add such a device click on the Bluetooth icon on the right side of the description and wait for the connection to be established. Once the connection is established, the icon and description turn white.

Pressing the „+“ button adds device support to the application. For controllers in factory mode, the customization mechanism for the selected module is started here and the instructions in the **Device Configuration** window must be followed:

- › Enter the name under which the device will be displayed;
 - › From the drop-down list of passwords, select the password for the administrator and user;
 - › Set the parameters of the Wi-Fi network (network name and password) to which the device will connect;
-



Fox controllers can only connect to Wi-Fi networks operating in the 2.4 GHz band.

- › Set other configuration parameters as necessary: user password, remote access account, link to the programmers calendar, and the time zone and location of the device necessary for proper operation of the programmers;
- › After entering all the data, press the **OK** button and wait for the configuration to be sent to the device. The application will continuously display messages about the progress of saving the configuration and inform about possible errors;

- › When the configuration is saved correctly, the device disappears from the list of retrieved devices and is moved to the list of devices visible in the application.



If you personalize more devices, you can use the **Set Defaults** option at the top of the **Device Configuration** screen. Pressing this button will substitute all recently entered data (passwords, Wi-Fi settings, remote access, calendar, location and time zone) into the new device.

Selection of meter type

To set the type of energy meter connected to the Modbus Energy integrator, start the Fox application and then:

- » Navigate to the Modbus Energy device icon and open the view by long-pressing the icon;
- » From the menu on the right-hand side of the view, select **Settings**;
- » Scroll through the list of settings to display the **Selected device** item and then expand the **Modbus settings** command;
- » Press the **Change** button below the settings list to activate access to the settings;
- » Expand the **Selected meter** list and select the type of device connected to the meter;
- » Set the remaining communication parameters (parity check, stop bits, baud rate and Modbus address).



For brand new meters or meters operating with default settings, you can press the **Default** button to the right of the device type field, which will automatically set the correct communication parameters. In other cases, manually rewrite all the settings from the meter.



After configuring the meter type and configuration parameters, confirm the changes by pressing the **Save** button located below the communication settings.

Telemetry

Fox Modbus Energy allows energy consumption and monitored network parameters to be recorded. Data can be accessed directly from the application (Telemetry command visible in the device context menu) or via any web browser.

(address <https://telemetron.fhome.cloud>).



Starting data logging requires entering the module settings and selecting the **Telemetry** option. Data logging and access to measurement history requires configured remote access.



Data logging requires the meter to have constant access to the internet. In its absence, current readings of voltages, currents and power are lost. The last energy meter status is stored in the meter's memory and saved to the database when the internet connection is restored.



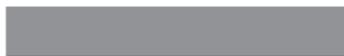
Energy consumption data will be stored in the database for a minimum of 10 years, after which they will be overwritten by more recent readings. Other network parameters (voltages, currents, powers) will be stored in the database for a minimum of 3 months, after which they will be overwritten by more recent readings.

LED signalling

The status of the module can be directly assessed by the **STATUS** LED located on the front of the device.



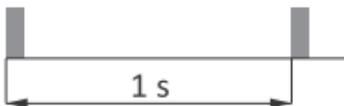
The grey color actually corresponds to the green LED and the black color to the red LED.



Controller
in factory mode

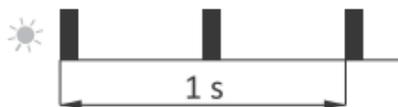


Connecting to
a Wi-Fi network



Connection to Wi-Fi
network established

LED signalling cont.



No connection
to Wi-Fi network



Restoring firmware

Communication indication

A correct data reading from the energy meter is indicated by the blinking of the yellow **DATA** light. Data readings are on a 3-second cycle, lack of readings signalling or long gaps between readings indicate a lack of or problems with communication with the meter.

Restore factory settings

In case of lack of access to the controller, for example due to lost passwords, it is recommended that you reset the access passwords and then reconnect and configure the controller using the Fox application.

To reset passwords:

1. While the controller is operating, press and hold the **RESET** button on the front of the controller. When the button is pressed, the green LED (**STATUS**) will start to flash rapidly.

2. After about 5 seconds, the green LED (**STATUS**) will turn off and you should release the **RESET** button.
 3. Press the **RESET** button briefly, the green LED (**STATUS**) will light up again.
 4. Press and hold down the **RESET** button. After about 3 seconds, the previously switched on green LED (**STATUS**) will start to flash. After another 3 seconds, it will go out and the red LED (**ERROR**) light up.
 5. Release the button - after a few seconds the red LED (**ERROR**) switches off, the green LED (**STATUS**) switches on and the controller restarts.
2. After completing this procedure, the access passwords and parameters for remote access have been cleared. You can now search for your device again in the app and personalize it again.

Technical data

power supply	165÷265 V AC
output	RS-485
communication protocols	Modbus RTU
supported energy meters	LE-01MR, LE-01MR v2, LE-01MW, LE-01MW v2, LE-01MQ, LE-03MQ, LE-03MQ v2, LE-03MQ CT, LE-03MW, LE-03MW CT
signalling	device status, RS-485 communication
power consumption	<2 W
communication	
radio frequency	2.4 GHz
transmission	Wi-Fi
radio power (IEEE 802.11n)	<20 dBm
receiver sensitivity	-98 dBm

terminal	2.5 mm ² screw terminals (cord) 4.0 mm ² screw terminals (wire)
tightening torque	0.5 Nm
working temperature	-20÷50°C
humidity	<90%
	(no condensation of steam and aggressive gases)
dimensions	1 module (18 mm)
mounting	on TH-35 rail
ingress protection	IP20

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 declaration

F&F Filipowski sp. j. declares that the device is in conformity with the essential requirements of Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.

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