

Web Energy Meter V1.0

User Manual

Web Energy Meter is an application running on Tibbo hardware, developed by Index Elettronica in partnership with RCC Italy. It allows to monitor electric power consumption from any device which has a browser (PC, tablet, smartphone) and is connected to the same network.

RCC Italy is able to provide all the required hardware:

- network analyzer module with Modbus interface;
- Tibbo DS1102W controller, with Ethernet and WiFi interfaces;
- power supply and cables.

Please refer to specific documents for hardware installation; here the software application only is described.

The application is currently available in two versions:

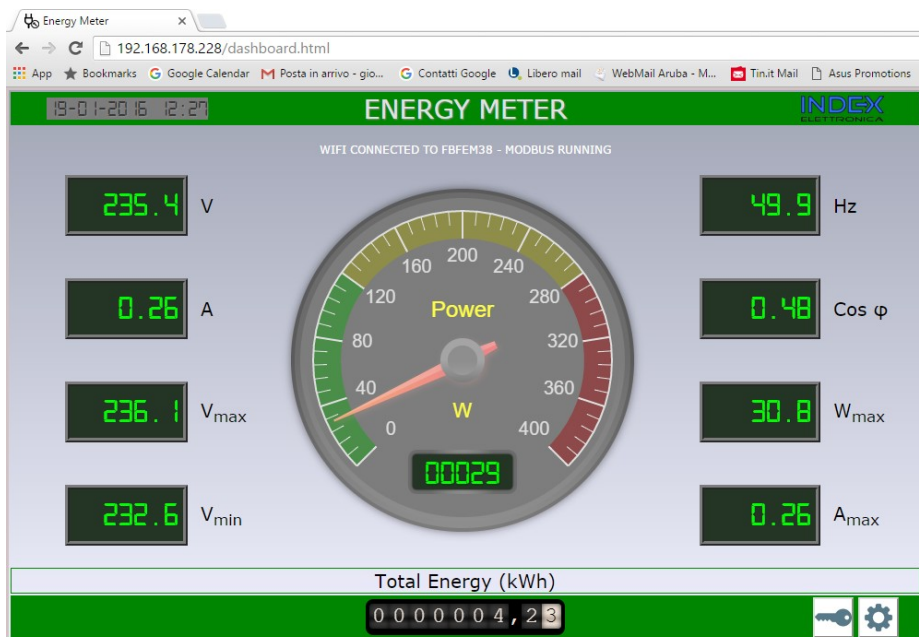
- *Free version*, preinstalled on the hardware supplied by RCC Italy
- *Logger version*, which can be activated by purchasing an activation code from the Index Elettronica website.

Free version

The free version allows monitoring of the main electrical parameters in real time:

- instantaneous power (both numerically and as a “tachometer”)
- consumed kWh
- voltage
- current
- max voltage
- min voltage
- frequency
- power factor ($\cos \varphi$)
- max power
- max current

All this data are grouped in the Dashboard page:



Min/max data are automatically updated every 10 minutes.

In the lower bar, along with the kWh counter, two buttons are present:



to access the “Passwords and licenses” page

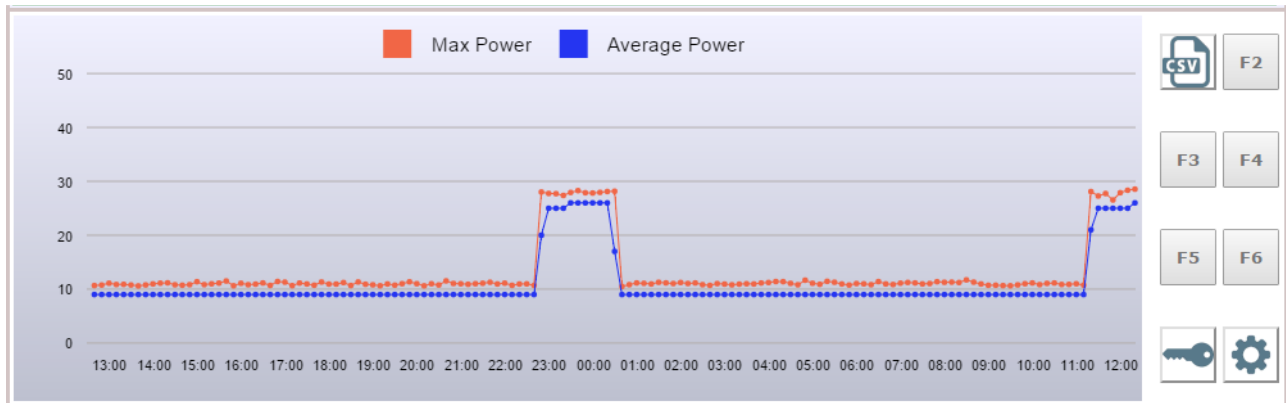





to access the “Settings” page

Logger version

The Logger version records, at 10 minute intervals, the average power and maximum power values in a time span of 24 hours, and displays them as a chart in the web page. This allows to estimate average and peak power consumption in the different times of the day.

Recorded data can be exported in CSV format, compatible with all the main spreadsheet programs.



On the right of the chart a group of function buttons is present. Along with  and , already described in the free version, the  button is available which allows to export last 24-hour data in CSV format.

The other buttons F2 F3 F4 F5 F6 are not enabled, they are reserved for additional functions that will be introduced in new program versions.

Initial startup

First check that all the hardware components are correctly connected – please refer to the documentation supplied with the hardware.

For the initial setup the Energy Meter must be connected to a PC with a Ethernet cable (to be plugged into the RJ45 connector of the Tibbo controller). It is not possible to use WiFi during this phase.

Once the connections have been completed, the system may be powered up. On the network analyzer module and on the Tibbo controller several LEDs indicate the working status (see Diagnostics).

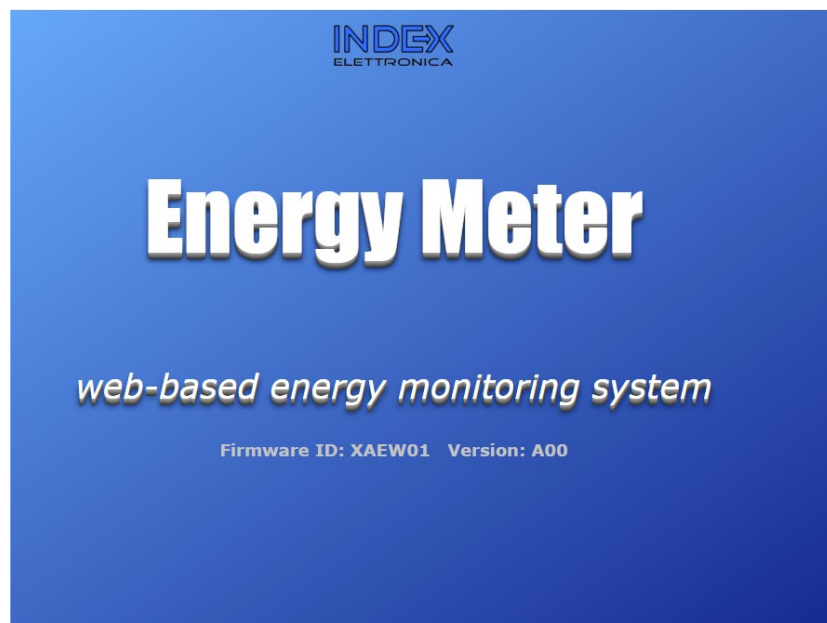
The default IP address of the Energy Meter is 192.168.0.228. To access the Energy Meter from a PC, the PC must be set in fixed-IP mode, and its network address must be compatible with the Energy Meter address (192.168.0.xxx, where xxx may be any value between 0 and 255 except 228).

If this is not the case, the network settings of the PC should be changed or, alternatively, the DeviceFinder program (freely downloadable from the Index Elettronica website) may be used.


<http://www.indexmicro.com/indexelettronica/download>

Using DeviceFinder the Energy Meter can be located in the network and its IP address can be modified in order to make it compatible with your own local area network.

Once the Energy Meter is accessible via the network, the web interface can be reached by entering the address in the browser address bar. The initial screen should appear:



After a few seconds the “dashboard” page should appear, as explained before.

Once the connection to the Energy Meter has been established, it is possible to set other parameters in the “Settings” page, which can be accessed with the  button. If the Tibbo controller is equipped with a WiFi interface, the connection parameters to a wireless access point can be entered. Once a connection between the access point and the Energy Meter has been established, the network cable may be removed and the web interface may be accessed by entering the same IP address which has been entered in the WiFi settings.

“Passwords and licenses” page

This page allows to set a password to protect the access to the Energy Meter. If a password has been previously set, it may be entered in this page to obtain access.

Currently installed firmware version and device serial number are shown in this page as well. It is also possible to enter activation codes to enable additional program functions.

If you own the free version and you want to upgrade to the logger version you have to enter the activation code (4 groups of 5 characters) in the “SOFTWARE LICENSES ACTIVATION” box. You may purchase a license from the [Index Elettronica website](#) (please indicate the S/N shown under the box).

NOTE: currently only Italian customers are allowed to purchase the license, please check the website for more information.

“Settings” page

Here several settings are available, related both to the application and to the network connection:

Dashboard preferences

In this box the graphical indicator of the instantaneous power preferences may be set:

- the limit value for the “low power” range (green zone)
- the limit value for the “medium power” range (yellow zone)
- the full scale value
- the measurement units (W or kW)

Note: dashboard preferences are saved in browser “cookies”, and therefore are related to the individual device on which they have been set (different devices may be connected to the same Energy Meter, with different dashboard settings).

Ethernet network settings

Enter here the cable network parameters. The Energy Meter requires a fixed IP address (not DHCP). Check your router settings to see which address ranges may be used as fixed IP addresses.

A SNTP server address is required as well, by which the Energy Meter will keep its date and time synchronized. A default address is preset in the firmware, however a different one may be chosen in case of problems. SNTP server addresses may easily be found with a web search.

Note: the upper dashboard bar shows current date and time. If an incorrect date/time is shown, check the SNTP server settings.

Wireless network settings

Enter here the WiFi connection settings.

To work in wireless mode the Energy Meter needs to connect to a WiFi access point. Make sure that you have all the access data (SSID, security, password) and that the access point signal is adequate to ensure a stable connection.

Also for wireless connection the Energy Meter requires a fixed IP address (not DHCP). Check your router settings to see which address ranges may be used as fixed IP addresses.

Diagnostics

Several LEDs are available which allow to check the working status of the Energy Meter and to identify possible problems:

- one yellow LED on the network analyzer module;
- three LEDs (yellow, green, red) and a five blue LED array on the Tibbo controller.

The meaning of each LED is as follows:

Yellow LED on the network analyzer module		
Status	Meaning	Notes
Off	No power	If power supply is on, check power connections to the module
On steady	Power OK, no communication	Check serial cable which connects network analyzer to Tibbo controller
On, with a short off blink every few seconds	Communication running	Normal condition

Yellow LED on Tibbo controller		
Status	Meaning	Notes
Off	Network cable disconnected	
On steady	Network cable connected	

Red and green LEDs on Tibbo controller		
Status	Meaning	Notes
Green flashing very quickly	Operating system starting	Appears immediately after power on or after a reboot (lasts a couple of seconds)
Green flashing at short intervals	Application initializing	Follows boot phase (lasts a couple of seconds)
Green/red slowly alternately flashing	Communication with analyzer module starting	If lasts more than a few seconds check serial connection from controller to analyzer module
Green flashing slowly	Communication established	Normal condition

Array of five blue LEDs on Tibbo controller		
Status	Meaning	Notes
All off	WiFi not connected	
From 1 to 5 LEDs on	WiFi connected, the number of on LEDs shows signal strength	For a stable connection at least 3 LEDs should be on

Reset button

A small button on the Tibbo controller (near the RJ45 connector) allows to restore the default IP address (192.168.0.228) and to clear the password for web access.

If this button is kept depressed for more than 5 seconds the red and green LEDs will flash briefly, then the device will restart with the default settings.

Information on Free Software and Open Source packages used

The Web Energy Meter application uses some public domain code pieces. The following is a list of the software packages used, along with their copyright owners:

canv-gauge Copyright (c) 2012 Mykhailo Stadnyk
Bluff Copyright (c) 2008-2010 James Coglan
odometer Copyright (c) 2013 HubSpot

For more information on Free Software and Open Source packages used, send a request to:
info@indexelettronica.it