

This manual is valid for mecMeter (Version 2.0, Firmware >2.3.1).

1. Technical data

- Three phase power meter 3x230 V; 50 Hz
- Measurable current depends on current transformers, input voltage 0- 333 mV AC
- Not to be used for billing purposes (not MID compliant)
- Bi-directional meter, measuring of consumption and feed-in per phase and total sum
- Measurement per phase of
- Active power (resolution 1/10 W)
- Reactive power (resolution 1/10 var)
- Apparent power (resolution 1/10 VA)
- Active energy (resolution 1/10 Wh)
- Reactive energy (resolution 1/10 varh)
- Apparent energy (resolution 1/10 VAh)
- Phase angle (resolution 1/10°)
- Voltage (resolution 1/10 V)
- Current (resolution 1 mA)
- Frequency (resolution 1/100 Hz)
- Communication types: WiFi (internal antenna), Ethernet and Powerline (dynamic IP)
- Static IP-setting via Ethernet available
- To be mounted on top-hat rails (EN 60715) in electric distribution boxes
- Own consumption typical 2 W (3 W max.) on L3

2. Delivery scope

- mecMeter 2.0
- Installation manual
- Current transformers and power line adapters are not included

3. Compatible current transformers

- 333 mV secondary voltage
- Primary amperage individually configurable

4. Environmental conditions

- Ambient temperature in operation: 0°C to +50°C
- Ambient temperature during storage: -20°C to +70°C
- Relative air humidity: 10-90% REH
- Non-condensing humidity
- Only for indoor use in closed rooms

5. Safety precautions

- Usage other than intended may lead to severe injuries or fatal accidents.
- Installation is only allowed for qualified electricians. Improper installation may lead to fire or electric shocks.
- Current transformers must be connected to the power meter before measured conductor is placed under voltage.
- Do not dispose the device with regular household waste. Please dispose it at your local collection point for electrical scrap.

6. Installation

The meter may be connected to three or one phases. If used to measure active power (W) and active energy (Wh) metering of the neutral wire is necessary.

- If used with single phase L3 and N must be used on the voltage measurement side. The current transformer must be attached to input „3“.

For accurate measurement following points must be observed:

- Mounting of current transformers and voltage tap-off must be according to the labelling on the same phase (current transformer 1 to voltage tap-off 1,...). In case of uncertainty use an appropriate measuring device and power off the circuit breaker
- The correct orientation of the current transformers must be ensured. Connect the black and white wires according to the label. Check the orientation of the current transformers according to their manual (in most cases: arrow on the current transformers points from power source towards electric loads)

Allowed cross-section of wires connected to the voltage tap-off are 1.5 mm² or 2.5mm². Connected external conductors of the measured voltage must be externally protected with protected with an overcurrent protection of max. 16 A.

If the mecMeter is connected to a solar inverter, ensure powering off the inverter in addition to the respective overcurrent protection. Measurement of mecMeter's own consumption depends on placement of current transformers before or behind its power supply.

- Installation according to EN 60950-1 safety standard: Voltage tap-off must be after an external circuit breaker. Ensure an easy accessibility of an external disconnecter in final installation.

Power measurement stops in case of disconnecting external conductors from grid/power source (e.g. by switching off circuit breakers). Energy values will be stored in a permanent flash storage. By disconnecting external wire L3 device stops operating.

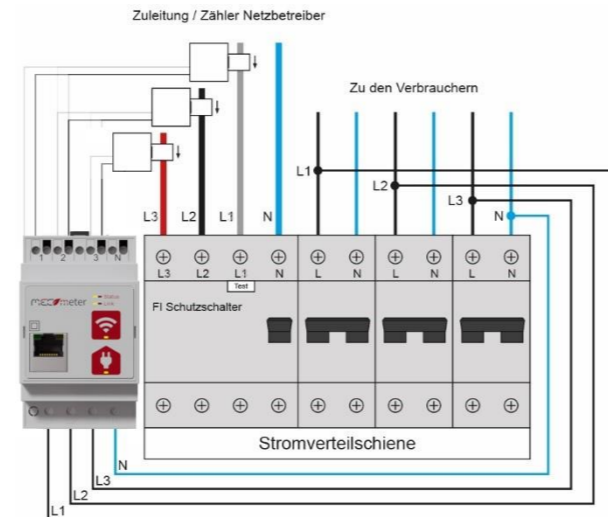


Illustration 1: Example wiring for 3-phases

7. LED

Status 1 LED	Green glowing: System available Green flashing: during system boot Red flashing: error
Status 2 LED	Green flashing: LAN connection attempt Green glowing: LAN connection active Red flashing: WiFi Access point active Red glowing: no network connection (LAN/WiFi/PLC)
PLC LED	Green flashing: Pairing mode Green glowing: PLC connected
WiFi LED	Green flashing: WiFi connection attempt Green glowing: WiFi connected

8. Buttons

WiFi	2s: activate/deactivate WiFi Access point (status change after 5 seconds indicated by Status 2 LED) Access point automatically closes after 30 minutes
PLC	2s: start PLC Pairing mode 7s: PLC remove pairing 10s: reset PLC

9. Initial setup prerequisites

- Ensure correct installation by an authorized installer and an undamaged device.

After successful installation according to point 6 Status 1 LED glows green. Continue with initial setup.

10. Initial setup

10.1. Setup with WiFi Access point

- Activate access point by pressing the WiFi-button for 2 seconds
- Status 2 LED starts blinking when Wifi access point is active
- Search for the WiFi with your smartphone/computer, the name (SSID) of the network is "mec<MAC address>"
- Password for the access point is: **powermeter**
- Open internet browser and enter following URL:

<http://192.168.255.1/>

You will be forwarded to the configuration site. Proceed with 10.3

10.2. Setup without Access point

- Setup with wired Ethernet
 - Attach Ethernet cable to the meter and connect it to your network
- Setup with Powerline
 - Connect your powerline-adaptor with your network and activate pairing mode (see manual)
 - Activate pairing mode on the meter by pressing the PLC-button for 3 seconds
 - Successful pairing is indicated by a constantly green glowing PLC-LED

The meter will now obtain a dynamic IP-address (DHCP-client). The user interface can be reached by entering the IP-address into a browser. Please ensure your device is connected to the same network as the meter. To obtain the IP-address of the meter please consult the manual of your network components or your network administrator.

10.3. User interface

After starting the initial setup please follow the steps shown. You will be asked for the initial password.

Initial password: 123

Afterwards you can enter your individual password.

10.4. Current transformers

Please enter the amperage of the attached current transformers for the primary circuit. Only integers are allowed. Please find the relevant data printed on the current transformers, in the respective manual or contact the manufacturer. Only use compatible current transformers (see section 3)

10.5. Single-/Multiphase

Please choose if your meter is attached to one (single) or multiple phases.

10.6. Installation check

After choosing the right option for the attached current transformers current measure values will be shown. Check correct installation according to following points (for 3-phases connection):

The Meter currently measures following values:
Note: After selection of the current transformer it takes some seconds until correct values are displayed

Active Power (+grid consumption -feed-in)	Phase 1: 665 W Phase 2: 94 W Phase 3: 110 W Overall: 869 W
Voltage	Phase 1: 232 V Phase 2: 229 V Phase 3: 231 V
Current	Phase 1: 4 A Phase 2: 1 A Phase 3: 1 A

- Correct active power values:
If power is consumed from the grid during measurement positive active power values for all phases should be shown on the screen.
- Phase angle voltage – voltage:
Phase angles should differ about 120° from each other (e.g. 119°, -120°, 0°)
- Phase angle voltage – current:
Depending on attached loads typical measurement values are between -90 and +90°.
- In case of doubt use appropriate measurement devices to check the installation.
- For easier installation checks it is recommended to temporary turn off existing photovoltaic systems (see manufacturer information)

10.7. Selection of the network connection

Select how you want to connect your mecMeter to your network and follow the instructions on the interface.

10.8. Finalisation of initial setup

Your mecMeter is now connected to the home network and can be reached via the corresponding IP address. Alternatively, you can reach the interface via <http://mec<MAC Address>.local> (provided that Zero-Conf services are supported).

- If you cannot access the login screen please check your router configuration. For further information please see section 13 (Troubleshooting).

- Click "Login" and enter your chosen personal password. Confirm by clicking on "Login".
- Current measurement data and connection status will be shown on the next screen.
- In addition, following menu items are available:—

	Measured values and connection status
	Language selection and modification
	Change password
	Advanced settings
	Information about mecMeter
	Logout

11. Advanced settings

Network	Change of network settings possible
Energy values	Reset of all energy values or offset of total active energy values in Watthours (Wh). By entering offset values the metered active energy values can be corrected (e.g. to adjust values to the grid operator's meter values enter the difference). Positive as well as negative offsets can be entered, energy values below 0 will be corrected automatically to 0.
Firmware Update	Update the firmware of the device and information about current firmware version.
Interfaces	All implemented data interfaces can be (de-)activated. By clicking the shown links you will be redirected to the corresponding interface URL.
Single-/Multiphase	Changes the reported values of the device (only one phase or all phases). ATTENTION: a change leads to a reset of all metering values
Reboot devices	Device performs a reboot

12. Reaching the device within a network

The user interface of the devices can be accessed via the IP-address of the device. In addition the device can be reached by `http://vpm<serialnumber>.local` if needed services are supported within the network.

13. mecMeter factory reset

In case of forgotten passwords or other reasons to factory-reset your power meter carry out following step:

Hold down PLC and WiFi button simultaneously for at least 10 seconds. For a device without PLC – press the WiFi button for at least 20 seconds.



Performing a reset will irrevocably delete measured data and settings from the device.

After the reboot your power meter is successfully reset. Initial setup can be started again (see point 10).

14. Troubleshooting

14.1. Measured values seem to be wrong

Check correct installation of the mecMeter and the attached current transformers (orientation of current transformers, phase match) and voltage tap-off connection with an appropriate measuring device. Also ensure a correct choice of current transformers type (perform reset).

14.2. What amperage do my current transformers have

Please check data printed on the current transformers, the manual of the current transformers or contact the vendor/manufacturer.

14.3. WiFi connection cannot be established

Ensure your WiFi network is working and that the signal strength on the location of the mecMeter is sufficient. Re-enter your WiFi credentials by entering the "Advanced Settings" Menu --> "Network"

14.4. PLC connection cannot be established

Ensure your adapter supports HomePlug AV or HomePlug AV2 standard. Using PLC-adapters on multiple outlet strips is not recommended by most vendors.

14.5. I forgot my password

Perform a reset (section 11) and restart initial setup.

14.6. MecMeter cannot be reached by `http://mec<MAC address>.local`.

Check correct spelling of URL (in particular „http://“ without „s“). Ensure necessary services for name resolution in connection with AVAHI are installed on your computer (e.g. Apple Bonjour®). Please check again the entered serial number (without any colons). Alternatively try to connect to the power meter by entering its IP-address. To obtain the

correct IP-address read manufacturer manual of your router or contact your network administrator.

14.7. Status 1 LED shows an error (red glowing)

Perform a reset of your mecMeter and carry out initial setup again. If the problem cannot be solved contact the manufacturer.

14.8. Obtain MAC-Address of the mecMeter

Depending on your connection choice (WiFi, Ethernet or Powerline) the mecMeter has different MAC-Addresses. The current MAC-Address is shown on the bottom of the "Measured values and connection status" screen. The main MAC-address is also printed on the back of the device.

14.9. Obtain the serial number of the mecMeter

The serial number is shown on the screen of "Information about mecMeter". In addition, it is printed on the back of the device and on the packaging.

14.10. What are the credentials for accessing the local data interfaces?

The username for the HTML, JSON and XML data interface is "admin". The password is the same as for the user interface of the device.

15. Open Source licences

Respective licence terms can be found in the user interface – see "About". Contact the manufacturer in case of source code requests.

16. Standards

The mecMeter 2.0 complies with the necessary standards for CE declaration and complies with RoHS (Reduction of Hazardous Substances) requirements.

EMC Immunity	EN 61000-6-2:2005
EMC Emissions	EN 61000-6-3:2007
Safety	EN 60950-1 Kat. II 230V
Accuracy	oriented towards EN 50470-3/class B*
* depending on used current transformers, cannot be guaranteed	

17. Contact and manufacturer

Mr. Robert Haidinger, Project Manager
 MEC electronics Entwicklung und Produktion GmbH
 Dresdner Straße 45 / DG
 1200 Vienna
 Austria

E-Mail: robert.haidinger@mec.at
 Tel: +43 1 3341855-0