

		EMPower03 Power Monitor		created	JL
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Install Guide	Rev. Nr.			1.1	valid from

INTRODUCTION

This guide describes how to install the Energy Matters EMPower03 power monitor. The power monitor measures the power generated by the solar inverter and the power consumed by the household. Data is uploaded to a secure server on the internet via the customer's broadband connection.

INITIAL CHECKS

The power monitor is designed to be installed on sites which have:

- Single phase electricity supply & single switchboard on the site
- Broadband internet with a spare Ethernet port on the router

If the customer doesn't have a spare Ethernet port on their broadband router, the simplest and cheapest option is for them to purchase a ~ \$30 Ethernet switch (5 port or 8 port) from an electrical retailer.

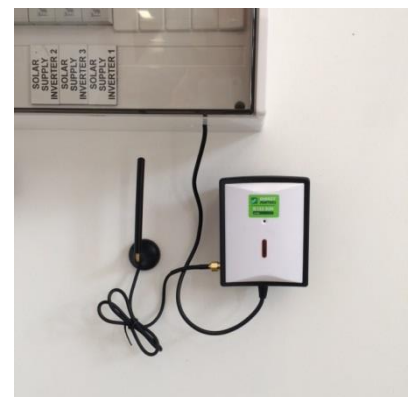
LOCATION

The gateway is installed near the customer's broadband router.

The sensors and transmitters are installed in the switchboard enclosure. If the switchboard is indoors the transmitters can be installed next to the switchboard. The transmitters include self-adhesive Velcro tabs to attach to any clean surface.



Gateway



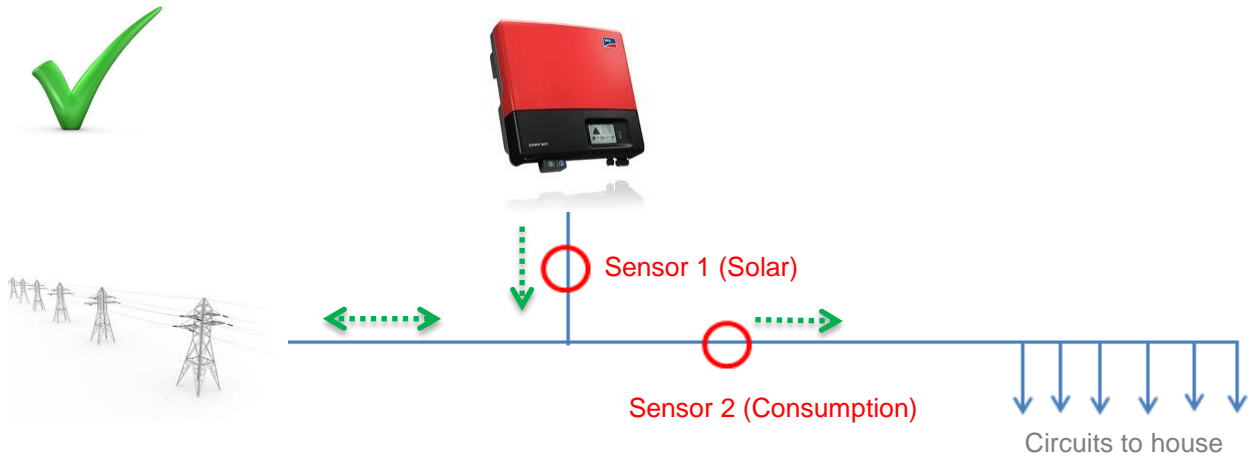
Transmitter



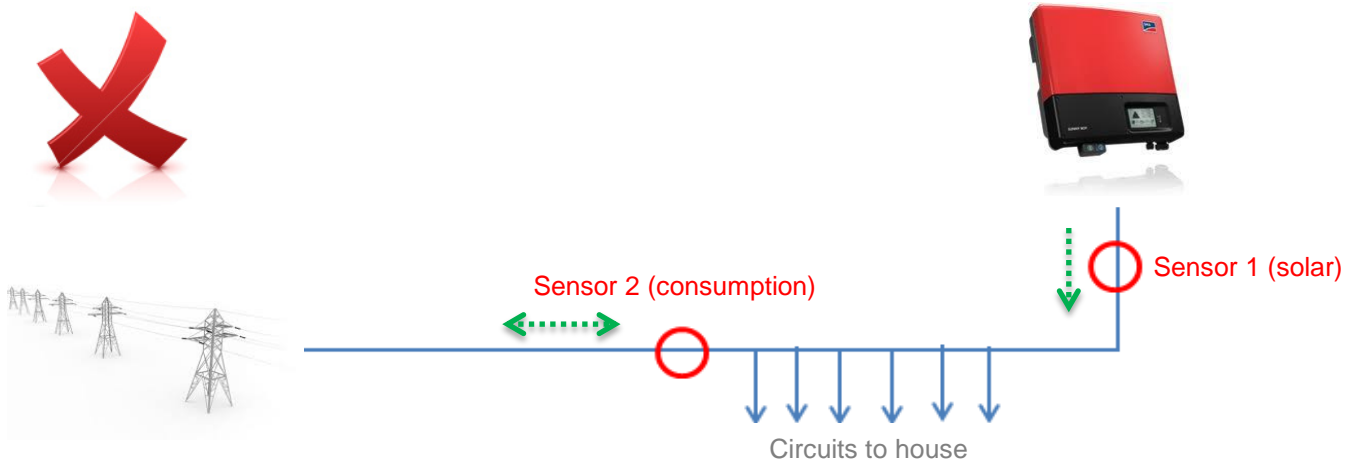
Self-adhesive Velcro

WIRING DIAGRAM

The sensors only measure the magnitude of current in the cable – they can't determine the direction of the current flow. So, they have to be installed in a location where the current only flows in one direction. The diagrams below show how to correctly install the power monitor:



The diagram below shows an incorrect wiring diagram. The cable measured by sensor 2 could have current flowing in either direction and thus will not be measured correctly.

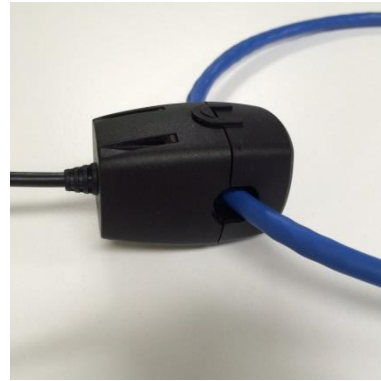


CONNECTING THE SENSORS

Each sensor connects to one transmitter. The current transformer is opened, and then re-closed around the cable to be measured. The current transformer can be installed in either orientation (it is not direction sensitive).

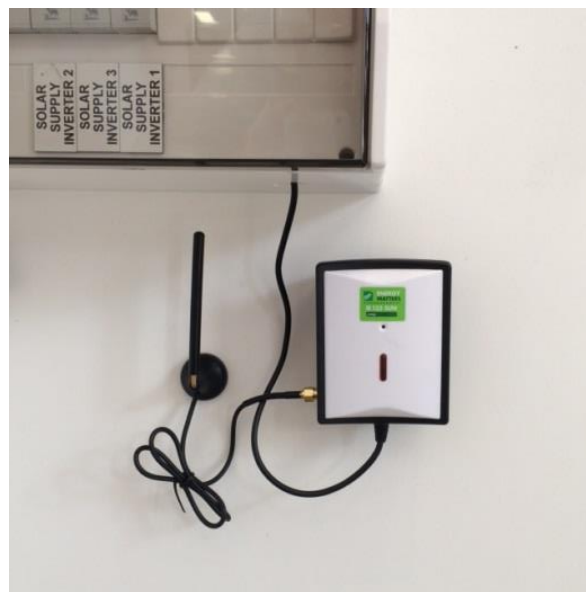


Sensor open



Sensor closed over a cable

Pull out the protective plastic tab from the back of the transmitter – this connects the batteries and the transmitter begins to transmit. A red light will blink.



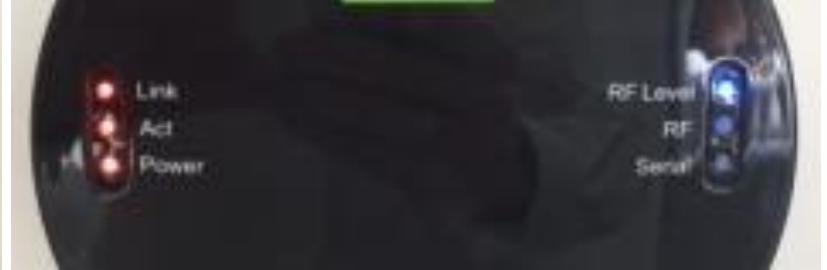
Transmitter installed indoors

GATEWAY

The gateway collects the transmissions from each transmitter and uploads the data to our secure server. The gateway needs to be plugged into a spare Ethernet port on the customers' broadband router; and also requires a spare 240 V power outlet.



Gateway connections



Gateway LEDs

The operating status can be determined from the LED lights:

- Link: lights up when Ethernet is connected
- Act: lights up when data flows over Ethernet
- Power: lights up when power is supplied
- RF level: lights up when the radio frequency (RF) signal is strong, flashes when weak, off when no signal (shows the weakest signal from all connected transmitters)
- RF: lights up when data flows over RF from the transmitter to the gateway
- Serial: ignore this one

POTENTIAL PROBLEMS

Not enough space for the sensors inside switchboard

Options include:

1. Re-wiring to create more space, at the customers expense;
2. Installing the solar sensor only, not the consumption sensor; or
3. Informing the customer that the installation can't be done.

Bus bars (not cables) in switchboards

A switchboard may have a bus bar (instead of a cable) just after the main isolator. A current clamp sensor can't usually be installed over this, as they intended to click over a cable. Options include:

1. Re-wiring with cable, at the customers expense;
2. Installing the solar sensor only, not the consumption sensor; or
3. Informing the customer that the installation can't be done.

Multiple cables

Sometimes the main isolator has multiple cables attached to it, which makes it difficult to install the consumption sensor (which ideally should clamp over a single cable). Options include:

1. Re-wiring so a single cable attaches to the main isolator (which then splits to multiple cables at a terminal block), at the customers expense;
2. Installing the solar sensor only, not the consumption sensor; or
3. Informing the customer that the installation can't be done.