OpenEnergyMonitor.org

System Overview

The OpenEnergyMonitor.org system is an open-source monitoring system with the capability to monitor electricity, temperature, humidity.

The system is made up of five main units. These can be assembled and configured to work for a variety of applications from home energy monitoring to solar PV import/export monitoring and building fabric thermal performance monitoring.

The system is fully open-source both hardware and software with documentation on everything from AC theory to sensor circuit design and application programming available on the OpenEnergyMonitor.org website.

emonPi

The emonPi is an all-in-one Raspberry Pi-based energy monitoring unit making for a simple installation where Ethernet or WiFi is available at the meter location.

The emonPi can monitor 2 x single-phase AC circuits using clip-on CT sensors. The emonPi can also monitor temperature & interface directly with utility meters via optical pulse sensor.

emonTx

The emonTx is a remote sensor node, data is transmitted via low power 433Mhz RF back to emonPi or emonBase.

The emonTx can monitor up to 4 x single-phase AC circuits using clip-on CT sensors. A plug-in AC-AC adapter can be used to power the unit and provide an AC voltage sample for Real Power calculations.

4 x AA batteries can be used to power the emonTx if access to DC power is not available.

The emonTx can also monitor multiple temperature sensors & interface directly with utility meters via optical pulse sensor.
emonTH

The emonTH is a long lasting, easy to deploy wireless room temperature and humidity sensing node designed for use in building thermal performance monitoring. The emonTH is powered by 2x AA batteries and is available with a choice of either DS18B20 based temperature sensing or DHT22 based Temperature and Humidity sensing. An external DS18B20 temperature sensor can easily be wired into screw terminal connector to provide external temperature readings.

emonBase

The emonbase is the internet gateway, relaying readings received via wireless from sensor nodes (emonTx / emonTH) to emoncms, an open-source energy monitoring web-application (see below). The emonBase is based on a Raspberry Pi a popular low cost Linux computer. The emonBase runs web server with emoncms installed for local data-logging to SD card and it can be configured to forward data to a remote cloud server such as emoncms.org

Emoncms

Emoncms.org is a powerful open-source web application for processing, storing, visualising energy and environmental data.

Open Project

The OpenEnergyMonitor project is an active online open-source community project with many developers from around the world contributing and using the technology for all sorts of different applications. Join in the discussion on the OpenEnergyMonitor.org forums

Shop

The OpenEnergyMonitor shop is ran by Glyn Hudson, Trystan Lea and Gwil Noble. We are based in Snowdonia, North Wales UK. We are both also founders and lead developers on the project: shop.openenergymonitor.com

Development

2016 is set to be a particularly active year for OpenEnergyMonitor development, with an increasing focus on control in addition to monitoring including developing an open source thermostat and heating scheduling module for emoncms. We are also collaborating with Carbon Coop in the UK to develop open-source tools for planning home retrofit work and The Center for Alternative Technology on open source zero carbon energy system models.