Draft 1.0

Hardware

Single Channel boards using the ESP8266 chip. Versions available for the Wemos D1 Mini and Node-MCU plugin modules. The A/D used is the ESP8266's single channel 10-bit A/D (0-1023 dec).

MLP191020 - Uses Wemos D1 Mini board

MLP201083 - Uses Wemos D1 Mini board. Surface mount version of above. Plus option to use voltage type **current transformers.

MLP201162 - Uses Wider Node-MCU board. Surface mount version. Plus option to use voltage type **current transformers.

4-Channel boards using the ESP8266 chip. Two versions are available, one that uses the ESP8266's own A/D (10-bit) and an external multiplexer to select the input channel. The other uses an external ADS1115 (16-bit) A/D. Both boards can use either the Wemos D1 Mini plugged into the headers or a soldered ESP12F module and external USB programmer interface. Both boards can be powered either via the Wemos D1's USB connector or external 12V DC supply.

MLP201136 – The Blue board uses the ESP8266's own 10-bit A/D with external multiplexer for channel selection.

MLP201077 – The Green board uses an external ADS1115 16-bit A/D.

MLP201185 – A 4-channel board using an ESP32 (Wemos Version). This boards uses the ESP32's own A/D input.

MLP201188 – A 4-channel board using an ESP32 (Node-MCU 30-Pin Version). This boards uses the ESP32's own A/D input.

Because of the different A/D's used the firmware used would depend on the board and are not interchangeable.

Current Transformers (CT) **

A current transformer requires a burden resistor (typical value 22Ω) fitted across its secondary winding, the A/D then measures the voltage across this resistor. The resistor can be either inside the CT's casing (voltage type) or on the interface board (current type), all boards have the 22Ω resistor fitted. You should only have one of these resistors in circuit, if using the voltage output type then the 22Ω resistor on the PCB should be removed, some boards have links that can be removed to accomplish this.

Typical CT’s would be marked as 100A/50mA for a current output type or 100A/1V for a voltage type. Any CT range can be used as long as it has the input range needed to measure the maximum expected load.

Firmware

Some simple firmware is available for these boards and can be used as the basis of a power sensing solution. However some very clever developers have written firmware for use with Home Assistant.

Single Channel Firmware

Basic test firmware on GitHub.

ESPHome firmware for use with Home Assistant. Please note the YAML file provided here does not use the LED fitted to the PCB.

4-Channel Firmware

Blue board MLP201136

Basic test firmware on GitHub.

A fork of the above code but with a YAML file for use with Home Assistant. Instructions for this version. Thanks to Darthmonkey.
22Ω

Green board MLP201077

Basic test firmware on GitHub.

Link to location of a YAML file for use with Home Assistant. Thanks to Dean Smith.

Simple calibration method

The easiest way to calibrate the board is to remove or turn off any existing calibration and take readings with both a known high load (higher the better) and no load. Then using either Arduino's MAP function or the filter function within the ESPHomes YAML file to calibrate the range. Because the board can not measure the mains supply voltage it may be necessary to assume a fixed voltage typical for the location.

Minimum usable value

With any CT used there is a minimum value readable due mainly to the very small signal being lost in the power supply noise. In practice with a 100A CT the minimum measurable value is around 100W.

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