Workshop 2: "Power measuring"

1 Description

If we want to reduce consumption/energy costs, measuring will be important. We need to know how much energy we get from our Solar Panel and how much we consume. If we consume less a battery has to be loaded for later use.

We want also monitoring our power management.

So in this workshop we will build a setup with sensors to measure current and voltage. An Arduino/Rpi/ESP will collect the data (voltage, current and power), transmit it to the master computer/smartphone/Rpi, and to a local OLED display.

Instead of using of using the power of our solar panels we will use 2 x 12V power supply.

2 Equipment

- Arduino/ESP8266/Rpi
- Current sensor ACS712
- Voltage sensor lm2596S
- Current Sensor Breakout - INA169
- Wires
- Breadboard

3 Technical info

Current sensor ACS712 20A



Voltage sensor: 25V to 5V



DC-DC convertor: Input 4-40V Output 1.3-37V 2A. (LM2596)



Search on internet the datasheets of the several sensors and OLED

Write here the links of datasheet and info

4 Shematic

Draw yours before wiring (Fritzing)

5 Programming

5.1 OLED-display

- Search how to find I2C-adres

https://create.arduino.cc/projecthub/abdularbi17/how-to-scan-i2c-address-in-arduino-eaadda

- Which libraries are necessairy?

  Add here program

- Try to write some text to the OLED

  Add here program

5.2 The current voltage

- For this we use a ACS712 sensor. There are 3 types, 5A, 20A and 30A. We will use the 20A version. To learn more about, watch the video's.

  https://www.youtube.com/watch?v=UF5jrnXvTlM

  https://www.youtube.com/watch?v=lisprJs5sNU

  https://www.youtube.com/watch?v=etsIFUUhO6I

- Write a program to determine the correct current values and check the results with a power supply. Display the info on the OLED display.

  Which libraries are necessairy?

  Add here program

5.3 The voltage sensor

- The voltage sensor is actually a voltage divider, made with two resistors. Input 25V- output 5V. Display the info on the OLED display.

  Which libraries are necessairy?

  Add here program

5.4 Current Sensor Breakout - INA169

https://www.opengreenenergy.com/diy-arduino-multifunction-energy-meter/

Which libraries are necessairy?

Add here program

6 Final setup

