Workshop 4: "Smartpi"

1 Description



The Smart Pi 3.0 expansion module extends the Raspberry Pi with interfaces to measure voltage and current in a contactless manner. It enables to control electricity production consumption and turns the Raspberry Pi into a full featured smart meter. All measurement data can be stored and are accessible via the local network or Internet for disposal.

Current is measured contactless via inductive current sensors. In the standard version currents up to 100 A can be measured. A simple changeover of the jumper enables the connection of any cable re-converter with a secondary current of 1 A. This allows currents of up to 1000 A and more to be detected.

The SmartPi 3.0 has 3 inputs for current measurement (L1, L2, L3) and three inputs for voltage measurement. This allows measurements on all three phases and even the neutral conductor. The SmartPi 3.0 and the Raspberry Pi can be powered by the voltage input. An external power supply is not required.

If the voltage measurement is connected, the direction of the energy flow can be determined and the SmartPi is a full-fledged bi-directional smart meter.

During this workshop we will try to let it work.

2 Equipment

- Rpi 4
- Smartpi
- Laptop

3 Website and REST interface

Open Source software is written in Go and includes all the necessary drivers, a web server with web page and a REST interface. All measurement data can be logged and displayed on tablet or smartphone. The REST interface allows to integrate the SmartPi into self-made applications and apps.

4 Features

4.1 Application examples

- Energy Monitor via network and Internet
- Monitoring of power frequency
- Power monitor
- Alarms for electricity consumers
- Alarms at increased consumption
- Integration into energy management systems
- Cost control

4.2 Software

- Reading current, voltage, power, and many other data
- Minutes store the values in the database
- MQTT Support
- Prometheus support (not yet documented)
- CSV FTP upload
- Web interface for display and configuration
- UMTS support

4.3 Features/Specifications

- Raspberry Pi compatible connector
- Raspberry Pi compatible size
- Galvanic isolation
- Integrated power supply from the voltage measuring path via stable terminals
- OpenSource driver and API
- Current measurement at 3-phase + neutral conductor
- Connection for inductive current sensors with a secondary output of 50 mA, 333 mV and 1 A
- Screw terminals for connection of current and voltage measurement
- Compatibility with all Raspberry Pi models
- Buffered RTC (the Raspberry Pi continues to run even without an Internet connection after a power failure)
- Additional status LED
- Valuable housing with DIN rail mounting

5 Links

- Installation: https://www.enerserve.eu/en/service/smartpi.html
- Forum: https://forum.enerserve.eu
- GitHub: https://github.com/nDenerserve/SmartPi