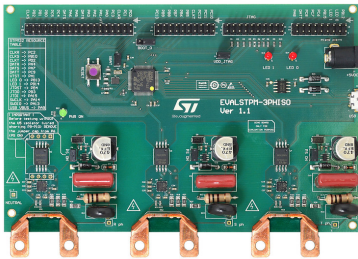


Three-phase full shunt electricity meter evaluation board based on STPMS2, STISO621W and STM32F413RH



Features

- Compliant to EN 50470-x, IEC 62053-2x, ANSI12.2x standard requirements for AC watt meters
- Active wideband, active fundamental, reactive and apparent power/energy calculation for each phase and cumulative
- Accuracy Class 0.5 according to IEC 62053-22 on 3-ph active/apparent power measurement
- Accuracy Class 1 according to IEC 62053-21 on 3-ph reactive power measurement
- 6 channels voltage and current decimated samples available @200 us
- 5 kHz measurement bandwidth
- RMS and THD (optional) calculation of each voltage and current signal
- Selectable high pass filter for DC measurement
- Line period and phase shift measurement for each phase
- Phase voltage delays
- Full calibration (amplitude, power offset and samples offset for DC measurement)
- Two configurable LED for pulsed outputs
- Communication through USB in virtual com port mode with shell commands
- 6 kV galvanic isolation between the phases with 8 mm creepage and clearance

Product status link

[EVALSTPM-3PHISO](#)

Description

The EVALSTPM-3PHISO evaluation board implements a complete three-phase energy meter with low-cost shunt current sensors.

The solution is based on the STPMS2 device, a double channel, 24-bits second order sigma-delta modulator, measuring voltage and current for each phase through a voltage divider and a shunt current sensor. Sensing circuitry and PCB layout are optimized to maximize signal-to-noise ratio for optimal accuracy.

The STPMS2 oversamples the signal using a 4 MHz clock distributed in a synchronized way by the microcontroller and outputs voltage and current sigma-delta bitstreams, multiplexed on the same pin.

The two-wire communication between STPMS2 modulator and MCU is isolated by STISO621W, 6 kV galvanic isolated interface, allowing up to 100 Mbps rate and low pulse distortion (<3ns) for safe and fast data transfer between isolated domains.

The FW embedded in the solution exploits the DFSDM filters of the STM32F413RH to convert the six bitstreams into 24-bits voltage and current data, at 200 us rate. All the metrology parameters are computed real time on a 200 us basis.

Two LEDs are available for active and reactive pulses generation.

The FW also implements a virtual com port communication to easily access the internal parameters to read metrology data, to modify the internal configuration for a high flexibility of the application, and to calibrate the board.

Revision history

Table 1. Document revision history

Date	Version	Changes
27-Oct-2020	1	Initial release.



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