

S1MMmA500V

Three Phase Power meter



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The S1MMmA500V is a complete three phase Power meter housed in a 17.5mm wide module and supports the connection of most common Current Transformers (1 or 5 A, 333mV, Rogowski probes). The S1MMmA500V can be supplied in three different versions:

S1MMmA500VM	S1MMmA500VLM	S1MMmA500VHM
For each phase:	All features of S1MMmA500VM plus:	All features of S1MMmA500VLM plus:
▶ I RMS, VRMS	▶ THD	▶ compliant to power quality requirement
▶ active power	▶ PF distortion	▶ harmonics up to the 63rd
▶ reactive power	▶ phase sequence monitoring	▶ interharmonics
▶ I pk, V pk	▶ max. demand	▶ SAG
▶ apparent power	▶ time above a threshold	▶ SELL
▶ crest factor	▶ TAN ϕ	▶ voltage interruption
▶ bidirectional energy	▶ min, max, average power	
▶ active/reactive energy totalizer	▶ min, max, average PF	
▶ power factor	▶ K factor (IEEE standard 1100-1992)	

S1MMmA500VM: ▶ for standard measurement requirements (Active/Reactive/Apparent Power, Bidirectional Energy, RMS values, Frequency, Power factor, etc)

S1MMmA500VLM: ▶ for THD measurement, minimum, average and max power measurement, max demand over 15minutes (configurable), phase sequence monitoring, time above a threshold and power factor distortion.

S1MMmA500VHM: ▶ for harmonics and intermediate harmonics up to the 63rd , SAG, SWELL and voltage interruptions. Power Quality standards.

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General features:

- ▶ POWER SUPPLY : 10...40 V DC or 19...28 V AC - 50/60Hz
- ▶ VOLTAGE INPUT: Direct connection up to 500V RMS maximum (40...70Hz)
- ▶ OUTPUT: RS485 Modbus RTU and SPST Digital Contact (<40 V, <100mA)
- ▶ Accuracy (@25°C, 50Hz)
 - > VOLTAGE (Un: 230/400 V): +/- 0,5% RDG (10...100% Un)
 - > CURRENT (In= 5A): +/- 0,5% RDG (5...100% In)
 - > FREQUENCY: +/- 0,1 Hz from 40...70Hz;
 - > POWER ACTIVE : +/- 0,5% RDG ; REACTIVE : +/- 0,5% RDG
 - > ENERGY ACTIVE: Class C according to EN50470-1/3 or Class 0,5 S according to EN62053-22
 - > REACTIVE: Class 0,5 S according to EN62053-24
- ▶ POWER ABSORPTION: < 500mW @ 24V DC
- ▶ SAMPLING RATE : 6400 Hz @ 50Hz
- ▶ BAUDRATE RS485 : from 1200...115200 Baud (standard 9600)

Connection analysis:



- 1 Connectors 1 to 6: Current inputs. On the same connectors you can attach the CTs secondary in Current (1 or 5 A) or in Voltage (333mV or Rogowski probes). PATENTED
- 2 Connectors 8 to 10 : Modbus connection. You can switch to a SPST digital contact (fully configurable) instead of RS485. PATENTED.
- 3 T-BUS connection on the bottom. Allows you to connect the RS485 and the Power supply with all the devices connected by the T-BUS connectors (optional), without any other wiring of the devices. It is used also to connect the RS485 Modbus if the Connectors 8 to 10 are set to perform as an alarm.
- 4 Connectors 15 to 18 : Voltage inputs. The device allows connection for Single phase, Three phase with or without Neutral, Aron Connection.
- 5 Connectors 11 and 12 : Power Supply. For AC/DC low voltage by external power supply. Allows LOW CONSUMPTION and INCREASED PROTECTION from the network.

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Installation strengths:

- ▶ **DIMENSIONS** : Can be installed on EXISTING PANELS due to the wide range of split core CTs suitable for any applications;
- ▶ **T-BUS CONNECTION** reduces installation time for more than one device;
- ▶ **Integration with other Qeed modules** : QE-BR-ETH-485 Bridge ETHERNET for Modbus TCP-IP communication, QE-8DI 8 channels Digital Input (counters) with the same dimension/ enclosure;
- ▶ **S1MMmA500V can work like THREE SINGLE PHASE METERS*** (Buildings, Offices, Shops);
*Only if they have the same Neutral and use the same CT type and ratio.
- ▶ **CONFIGURATION BY FACILE SOFTWARE** : the customer can copy and save the configuration to other devices (it is a .txt file);
- ▶ **REMOTE BOOTLOADER** to update the FW remotely (not for upgrade of the device version). It will be enough to be connected on the master Modbus device that manages the meter.

Other features:

- ▶ **SPST Digital Contact**: Is fully configurable and linked to any parameter. Allows you to work with a "window" with hysteresis;
- ▶ **Measurement filter setting**: Allows user to set a faster measurement up to one Period (20ms @50Hz). This information can be transmitted by RS485 in order to have a very fast (safety) reaction for any RMS measurement;
- ▶ **Oscilloscope mode***: Possible to reproduce the waveform of the three phase (plus Neutral) Voltage and three Currents of the network. This is possible at max baudrate (115200).
*PRO version only.



Any questions?

Don't hesitate to contact me if you have any further questions.

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S1MMmA500V

SUCCESSFUL APPLICATIONS:



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HVAC / REFRIGERATION / CHILLER MANUFACTURERS



The S1MMmA500VLM version allows inclusion of a Phase Sequence Monitor which, in order to avoid any damage, is mandatory when you are working with Compressors.

The manufacturers of Chillers become very sensitive to the Energy Consumption, often installing Energy measurement on the machines and offering monitoring services to their customers. Also the controller manufacturers in HVAC markets need to offer a complete monitoring system to acquire the Energy measurement coming from the Refrigerated showcases, fridge counters, Fans, Lights, etc, for Markets, Shops Centers.

ENERGY STORAGE SYSTEMS



due to the low consumption of the meter, it is suitable to be used by companies that sell and install STORAGE SYSTEMS linked to a RENEWABLE ENERGY production. The bidirectional measurement can help to check when it is possible to use the Energy stored instead of the network energy.

- ▶ PV (Photovoltaic) installations;
- ▶ Eolic Generators;
- ▶ Hydroelectric plants;
- ▶ Generators protection (due to the fast rms measurement the device can be used to protect the Generators from reversal current damages).

ENERGY MONITORING / ENERGY MANAGEMENT



The S1MMmA500V is the perfect solution to use for the Energy monitoring applications due to its dimensions, installation on the existing panels, low consumption and cost. It meets all the requirements of the new IoT standards due to the open Modbus standard used on the meter.

The device guarantee to the System Integrators or the Supervisors to approach and solve any issue for energy/power measurement using the same HW platform. We are a partner of many manufacturers of IoT Gateway/ Raspberry based products.

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SUCCESSFUL APPLICATIONS:



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OEM MACHINE MANUFACTURERS:

- ▶ Electric Industrial Ovens,
- ▶ PET Dryers manufacturers
- ▶ Dry and Fresh Pasta production line
- ▶ Panels manufacturers
- ▶ Any other machines with Motors or Pumps.

OTHER CUSTOMERS MARKET SECTORS

- ▶ Petrol Stations;
- ▶ Shops / Shopping centers
- ▶ Public Lighting
- ▶ Home & Buildings installations (Offices, Buildings, Banks)
- ▶ Small thermal power stations
- ▶ Maintenance services company

INDUSTRIAL PLANTS

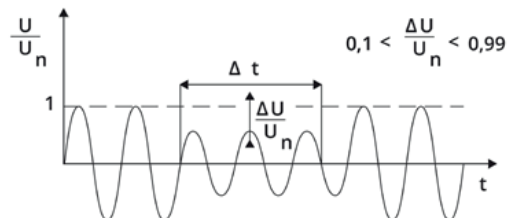
- ▶ Steel mills
- ▶ Paper mills
- ▶ Mining
- ▶ Cement mills
- ▶ Power generators plant (Biogas, Thermo, Coal, Methan)

WATER INDUSTRIES

- ▶ Pump stations
- ▶ Waste water plants

POWER QUALITY APPLICATIONS

The increased use of Inverters has introduced many problems onto the network. It has become very important to understand where the harmonics that disturb other machines are generated. The S1MMmA500VHM allow to satisfy the Power Quality standards to measure up to the 63rd harmonics and interharmonics.



Another big issue for the production plants is to identify VOLTAGE INTERRUPTIONS, (e.g.) A small interruption can create a big issue on Plastic Mould Injection machines possibly damaging production. The Customer can claim a refund for any damages to the National Electrical Company.



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