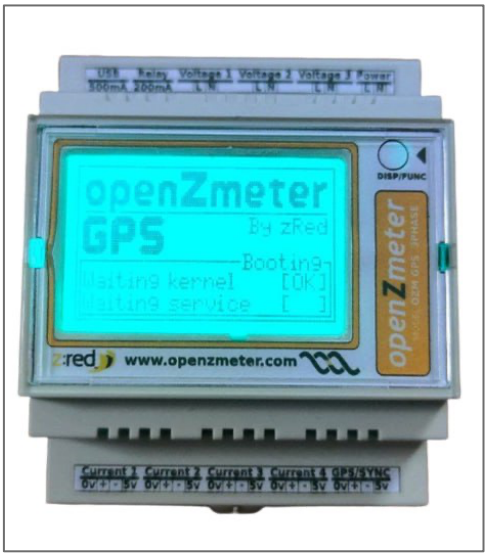

openZmeter ThreePhase GPS

Power quality analyzer and smart meter

openZmeter is an Open Source system aimed to help people with power quality analysis and smart energy metering in power networks.

openZmeter is designed to comply with international standards such as IEC 61000-4-30 and EN 50160. It can measure voltage from single or three phase universal input with an accuracy up to 0.1%, including DC system. Standard frequencies 50/60Hz are supported and can be measured with resolution up to 10 mHz. Current measurement depends on the selected external probe (current transformer, hall effect, Rogowski and others) with virtually unlimited value as long as they comply with the permitted input levels.

APPLICATIONS

- Power quality analysis and recording
- Power consumption monitoring
- Fault detection in power lines and installations
- Green energy generation monitoring
- Power billing services
- Comprehensive studies for electrical systems

FEATURES

Open source system: free software and open hardware publicly available.

Real time measurement: Multiple variables analyzed in real-time, most of them displayed in WEB interface.

- RMS values for voltage and current
- Active, fundamental reactive and apparent power
- Power Factor and phase angle
- Current, voltage and power harmonics (up to 50th)
- Active and reactive energy
- Frequency
- Harmonic distortion
- Symmetrical Components

Phasor representation: Visualization of phase angles between voltages and currents. In addition, symmetrical components displayed for three phase systems.

Raw samples: Real-time waveform for voltage, current and power, all of them exportable.

Full spectrum: Voltage and current FFT can be displayed and exported.

Events: Standard power quality related events (RVC, swell, dips and interruptions) detection and detailed storage. Full voltage and current pre-fault waveform and RMS values events can be displayed.

Consumption and generation: Valid for renewable energy systems. Measurements in all four quadrants.

Comply with international standards: All measurements are in accordance with IEC 61000-4-30 and EN 50160.

Aggregations: Data accumulated in time aggregations to reduce needed storage and speedup data recovery along extense periods. 200ms, 3s, 1min, 10min, 15min and 1h ares automatically generated.

WEB interface: Innovative and responsive interface based on latest web technologies with access to most of system functions and settings.

Alert system: Computation of customized alarms from available variables and arbitrary formulas stored and notifications with Telegram bot or MQTT.

Flexible inputs: The voltage inputs are electrically isolated, enabling discrete measurement across disparate circuits. This feature empowers the device to accommodate various electrical installations, from three-phase systems to multiple single or dual-phase systems. Furthermore, the device's auxiliary power connection provision facilitates precise assessment in variable frequency drives or other transiently connected load.

Digital integrated current inputs: It allows the direct use of Rogowski coils without integrator, applying the latest digital techniques.

Synchronized sampling: Simultaneous sampling of voltage and current channels with time stamping and GPS accuracy. Samples from different equipment, at different locations can be correlated with sample-level accuracy.

Live Streaming: The voltage and current waveform channels can be sent in real time to an external server with associated time stamps.

Energy heat map: Fast and intuitive view of yearly power consumption. Additional views with calendar, month, and weekday statistics.

Tariffs support: Advanced cost calculator, compatible with most countries' models, and easy to extend.

Battery backup: System analyze even on power outages, and allow to save this, including event information.

CONNECTIVITY

WIFI and Bluetooth: Access from any smartphone, browse available wireless networks and connect with few steps.

Time synchronization: Time can be set manually or automatically with NTP server.

API: An advanced application program interface allows accessing all functions from external software.

Remote access: Transparent access to your device from anywhere, even if inside of private networks. Manage your devices from one single web page.

Other protocols: Access analysis variables from other devices with Modbus/TCP, MQTT, and others.

Multiuser: Allow multiple access with configurable permissions.

POWER SUPPLY CHARACTERISTICS

		Min	Typ	Max	Units
Voltage range	AC	60.0	-	2650.0	Vac
	DC	60.0	-	375.0	Vdc
Consumption	110Vac	-	4.0	-	W
	230Vac	-	5.0	-	W
Frequency		0.0	-	100.0	Hz

ADQUISITION CHARACTERISTICS

ADC conversion characteristics		**Units**
Resolution	14	Bits
Sample rate	60	kHz

Voltage inputs			**Units**
For each input	Max	550,0	V
	Min	-550,0	V

Current inputs			**Units**
Probe supply voltage		5,0	V
Max voltage input	A or B pin	8	V
Min voltage input	A or B pin	-8	V
Min Gain		0.125	
Max Gain		176	
ADC input		±2.5	V

*Input range is changed by software configuration in 22 levels

MECHANICAL CHARACTERISTICS

		Units
Depth	60	Mm
Width	76	mm
Height	90	mm
Weight (with battery)	450	g

BATTERY CHARACTERISTICS

		Units
Type	2 x LIPO 18500	
Capacity	2x1400	mA

EXTENDED CHARACTERISTICS

Accuracy		**Units**
Voltage channel	0.1	%
Current channel	depending on external probe	%
Active Power		%
Apparent Power		%
Reactive Power		%
Active Energy		%
Reactive Energy		%
Frequency	10	mHz
GPS time accuracy	better than 500	ns
Power Factor		%
TDHv		%
THDi		%
Voltage Harmonics		%
Current Harmonics		%

ARM SOC		**Units**
Internal eMMC	8	Gb
Internal RAM	512	Mb
Database	PostgreSQL	-
Operating system	OpenWRT	

OPERATION CHARACTERISTICS

	Min	**Typ**	**Max**	**Units**
Working temperature	-20,0	-	55,0	ºC
Storage temperature	-20,0	-	85,0	ºC
Humidity	5,0	-	95,0	%