

Power Quality Monitoring



Highlights

Sensors with large measurement range

Ease of Installation – Non Intursive

Extensive Power Quality Parameters

Modular Wireless Achitecture

Extensive Power Quality Parameters

CASCADEMIC Power Quality Monitoring simplifies the implementation of Energy and Power Quality Monitoring Solution and helps focus on their key strengths. The solution is capable of monitoring voltage, current, and providing a detailed record when measurements fall outside pre-set limits. The solution also capable of monitoring the following parameters : voltage events (sags, swells, under voltage, over voltage and outages), harmonic distortions and frequencies . With an extensive parameter set as above , we enable customers characterize system performance and help them identify the nature of faults on power lines.

Multiple Sensor Support

With the support for Multiple Sensors , the solutions caters to Single Phase and 3 Phase Energy Monitoring . Inherent by design , the Solution caters to both Alternating Current and Direct Current Measurement by being compatible with Current Transformers , Hall Sensors and Rogowski Coil. The range of current measurement is scalable based on the sensors ranging from 0A to 1000A with high levels of accuracy . With the option of integrating additional sensors like Temperature , Humidity , Carbon Dioxide , the solution enables you to get a complete picture of the ambient environment at the installation site . The solution also has thee MODBUS Connectivity for expansion in case of further expansion and integration with third party systems .

Ease of Installation

The solutions can be commissioned on an existing power installation . The sensors being non intrusive can be clamped on to existing infrastructure without disruption. The independent current sensors and voltage taps allow accurate measurement without sacrificing security . The solution can also be provided with an IP enclosure to take care of outdoor environment conditions .

Modular Wireless Architecture

The power quality monitoring solution from CASCADEMIC can be connected to various wireless modules. Depending on the use case and the bin environment, the node can connect to the GSM (2G/3G/4G Network), LoRaWAN Network Server or a WiFi based Communication . The features enables partners and customers with rapid time to market and provides then various options on the connectivity which can vary based on the deployment environment .

Applications

Distribution Transformer Monitoring

The solution provides accurate supervision of the transformer and its environment and converts each simple transformer into an intelligent unit with continuous view of asset conditions , operating efficiencies and immediate notifications and alerts.

Utility Based Billing

With the need for management of energy resource and the **Pay as you Use** concept gaining value for tenants in telecom towers and Data centers, there is a need for monitoring the individual energy consumption and providing utility based billing reports.

Hardware

Processor	<ul style="list-style-type: none">ARM Cortex M4 based CPU
Operating Speed (Max)	<ul style="list-style-type: none">120 MHz
Memory	<ul style="list-style-type: none">128KB RAM1MB Program Flash Memory
Storage	<ul style="list-style-type: none">8MB SPI Flash
Power Supply	<ul style="list-style-type: none">24 V7.4V , 1100mAh rechargeable battery

Sensors and Wired Connectivity

Current	<ul style="list-style-type: none">Hall SensorsCurrent TransformersRogowski Coil
Voltage	<ul style="list-style-type: none">On Board Voltage MeasurementRange : 0 - 480V
Serial Interfaces	<ul style="list-style-type: none">RS485UART / TTL
Misc . Sensors	<ul style="list-style-type: none">Temperature Sensor4 Input / Output Pins

Power Quality Measurement Parameters

Voltage	<ul style="list-style-type: none">Voltage Sag and Swell
Power	<ul style="list-style-type: none">Total and Fundamental Active PowerVolt amperes reactive(VAR), volt amperes (VA), watt hour, VAR hour, and VA hour
Power Factor	<ul style="list-style-type: none">As per
Distortion	<ul style="list-style-type: none">Total Harmonic Distortion

Frequency	<ul style="list-style-type: none"> Line Frequency One per Phase
Phase Support	<ul style="list-style-type: none"> Single Phase and 3 Phase power lines

Connectivity - Wireless	
LoRaWAN	<ul style="list-style-type: none"> Operation Band :434 MHz , 868 MHz, 915MHz LoRaWAN Protocol Class A and Class C
Wi-Fi	<ul style="list-style-type: none"> 802.11b/g/n Client and Access Point Mode
WWAN – 3G / 4G / LTE	<ul style="list-style-type: none"> Quad Band GSM (850 / 900 /1800/1900 MHz) HSPA+ Data Rate – 42/5.7(DL/UL)[Mbps] LTE – Data Rate – 100/50(DL/UL)[Mbps]

User Interface	
LED Indication	<ul style="list-style-type: none"> Power Status Wireless Connectivity Status

Environmental Parameters	
Operating Temperature	<ul style="list-style-type: none"> 0 deg.C to 55 deg.C
Storage Temperature	<ul style="list-style-type: none"> 0 deg.C to 60 deg.C
Relative Humidity	<ul style="list-style-type: none"> 5% to 95% Non Condensing

Mechanical Parameters	
Standard	<ul style="list-style-type: none"> IP 55
Mounting	<ul style="list-style-type: none"> Wall mounting

Need for Monitoring of Power Quality

Good power quality and uninterrupted power are extremely important goals at many types of facilities, ranging from commercial and government buildings to data centers, healthcare centers, and manufacturing plants. When it comes to reliability of power in a facility, foresight is a lot better than hindsight.

Compromised power quality can cause damage to costly electrical equipment, reduce productivity, and disrupt daily operations. Variations in power quality can result from voltage spikes, swells, and sags; harmonic disturbances; and short and long interruptions of power lasting from a few milliseconds to over two seconds. And any of these events can occur at any time.

1) Fast Recovery

Detection of a problem early on, before it escalates and when it is easy to address, minimizes the likelihood of costly damage to equipment or costly interruption of business-as-usual. The ability to review stored, continuously recorded waveforms and spot anomalies such as sags and swells, transient harmonics, and power outages helps in the diagnosis of problems. The early detection can enable proactive scheduling of repairs in a timely fashion, rather than emergency repair at a time when maintenance or service personnel are not readily available or when shut-down of a load would be inconvenient.

2) Enhanced Analytics

Power quality analytics enables development of a baseline that can be used to evaluate the performance of electrical equipment and components over time. Comparison to baseline can detect performance trends which can impact preventive maintenance programs. The comparison to baseline also provides useful information that can help in predicting future power requirements and help in developing plans for purchasing additional electrical equipment such as servers or variable frequency drives.

3) Health of the Power Systems

With the Power Quality data of the systems, it would be easy to ascertain and establish the health of systems like Data Centers, Distribution Transformers and Power Distribution Units . This health analysis would help in reduction of operational costs and would reduce down time and and hence lead to an increase in efficiency.



Industrial IoT Gateway



Energy Monitoring Solution



LoRa Connectivity Solution

Innovation towards Embedded Planet

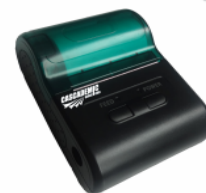
Cloud Connectivity Solution



Environment Monitoring



Thermal Printer



Address:

1743, 1st Floor, Sri Raghavendra Plaza
9th Cross, 2nd Phase, JP Nagar
Bangalore, Karnataka, India.
Pincode: 560078

Mobile: 080 2658 3333 Email: info@cascademic.com