General information

Power Quality Analyzer

- Should be a high-tech device providing its users with a comprehensive features for measuring, analysing and recording parameters of 50/60 Hz power networks and power quality in accordance with the Standard EN 50160
- The device should be provided with a built-in GSM modem (UMTS standard) and an antenna.
- The equipment should be portable and capable of field testing
- The equipment should have measurement recording and display facilities and it should be able to record the data with inbuilt auxiliary recorder with display screen for real time analysis
- The CT/PT output should be connected to the equipment without any additional interface
- The equipment must be able to measure and record harmonic current and voltage distortion
- The equipment should be capable of continuously logging all voltage and current waveform on internal memory of at least 8GB the data shall be stored with suitable data compression technology
- The equipment should have wide bandwidth high sampling rate for accurately capturing waveforms(at least 2048 samples/cycle) at high resolution and fast data storage with modern communication features
- The equipment should be provided with free data analysis software.
- The equipment should have necessary communication interface to collect the data from devices to central processing computer by means of GPRS modern or USB or IR receiver connection
- The equipment should be capable to generate report in line with IEEE 519

Technical details

Environmental conditions and standard compliances

- The device should works at temperature of -20deg to +55deg
- The device storage temperature range should be of -30deg to +60deg
- The device should work at a humidity of 10-90% with condensation
- Ingress protection: IP65

Input channels

Voltages

- The device should equipped with five voltage measurement inputs installed as cables terminated with banana plugs marked as L1, L2, L3, N and PE. The range of voltages measured should be 1000V.
- The voltage inputs should be sampled at a minimum of 2048 samples per cycle.
- The power adapter should have a nominal input voltage range 90...1000V AC and has separate terminals.
- The voltage measurements should have a measuring input impedance of 10M ohms.
- The user should have the option to set the PT ratio and it should be possible to change the ratio and adjust the data accordingly after the data is logged and collected for all the data or for user defined periods.
- The equipment should have a magnetic voltage adaptor used to connect voltage test leads to circuit breaker(type S) and residual current in switchgear.

Currents

- The device should equipped with four current measurement inputs installed as cables terminated with banana plugs marked as L1, L2, L3 and N. The range of current measured should be up to 6000A.
- The current measurements have a measuring input impedance of 100K ohms.
- The user should have the option to set CT ratio and it shall be possible to change the ratio and adjust the data accordingly after the data is logged and collected for all the data and for the user defined periods

Current Clamp

Rated current-100 A AC
Frequency-40 Hz…1 kHz
Max. diameter of measured conductor-24 mm
Minimum accuracy-0.5%
Lead length-3 m
Measurement category-III 300 V
IP-40

Measurements

- Should measure Voltage and current. The value shall be reported for every cycle and averaged for 200 milliseconds.
- Should measure Voltage and current crest factors,
- Should measure Power frequency in the 40- 70Hz range,
- Should measure Active, reactive and apparent power and energy values, distortion power

- Should measure Voltage and current harmonic components (up to the 50th),
- Should measure Total harmonic distortion (THD) for current and voltage,
- Should measure K-Factor (factor for transformer losses caused by higher harmonics),
- Should measure Active and reactive power values of harmonic components,
- Should measure Angles between voltage and current harmonics,
- Should measure Power factor, Displacement power factor (cosϕ), tanϕ,
- Should measure Unbalance factors and symmetrical components for three-phase systems,
- Should measure Short-term and long-term flicker Pst and Plt,
- Should measure current event detection including waveforms,

Storage

- It has an 8 Gb inbuilt memory card which can be extended up to 32 Gb(Max)

Accuracy of the equipment

- The equipment should provide measurement accuracy in accordance to IEC 61000-4-30 class A with certificate.
- The accuracy should remain with IEC 61000-4-30 Class A regardless of the operating condition
- All channels should be sampled simultaneously at the frequency synchronized with the frequency of the power supply voltage in the reference channel

Time synchronization

- The equipment should have provision of time synchronization via GPS
- Time synchronization of the analyzer with UTC is required by IEC 61000-4-30 standard for Class A for marking the measurement data

Communication

Device should have different ways of communication with a PC. They are as follows:

- wired communication via USB,
- radio communication using OR-1 receiver,
- Built-in wireless connectivity via GSM modem.

Security and encryption

- Device should have access to the equipment is lost against the unauthorised access, pin code to lock data reading.
- Immediate key locking should be available after the recording is activated.
- Device should have an anti-theft feature – should send an alarm message to the authorized person if the meter is relocated from the actual location.

Lcd display

- The device should have a colour 3.5" LCD display with a resolution of 320x240 pixels and a keypad buttons

Power quality analysis software

- Comprehensive power quality analysis and management software should be provided
- The software should perform both manual and automatic data collection from the equipment
- The software should allow us to select the analyser and set the voltage and current values
- The software should be highly flexible to the user requirements
- The software should be compatible with the windows latest operating system
- The software should have the feature of regular update.
- The free software license should be provided. (minimum 10 users)
- The report can be generated according to EN 50160, IEEE 519, NEC 220.87

Conformity to standards

The analyzer should be designed to meet the requirements of the following standards.

Standards relating to measurement of mains parameters:

• IEC 61000-4-30:2008 (ed. 2.0) – Electromagnetic compatibility (EMC). Testing and measurement techniques. Power quality measurement methods,

• IEC 61000-4-7:2009 (ed. 2.1) – Electromagnetic compatibility (EMC) – Testing and Measurement Techniques - General Guide on Harmonics and Interharmonics Measurements and Instrumentation, for Power Supply Systems and Equipment Connected Thereto,

• IEC 61000-4-15:2010 (ed. 2.0) – Electromagnetic compatibility (EMC) – Testing and Measurement Techniques - Flickermeter. Functional and Design Specifications,

• EN 50160:2010 – Voltage characteristics of electricity supplied by public distribution networks.