

A. T. M. S.

Proven Advanced Technology Solutions

QUADRENT Power Quality Recorder/Analyser

by **MADE-SA**

- Measures to EN50160 or any standard
- Simple to use
- Volts, Amps, Watts
- Dips, Swells, Breaks
- Max. Power & Current
- Harmonics & IH to 51.5
- Rogowski Coils for Amps
- Light weight & portable
- User friendly software
- Weatherproof H61 pole-mounted version



QUADRENT is an easy to use instrument for recording and analysing in detail the voltages, currents, power flows and disturbances in a single or three-phase L. V. network. The standard Power Quality analysis is **EN50160** but this can be modified by the user. It includes slow fluctuations, dips, swells, interruptions, frequency deviations and flicker as well as harmonics and inter-harmonics up to 51.5. Tariff-change command events can be recorded. The integration period and thresholds are configured for a measurement program using a PC via a USB connection. Recording can be started by a front-mounted button, or programmed to run for a specified period. Whilst running, *everything* is memorised and real-time measurements can be displayed on a PC. In operation it is powered from the voltage connections and LEDs confirm the system status. An internal battery keeps the system live during a power cut. After a measurement program, the desired records are transferred to the PC and the easy-to-use **WINQUAD** software is used for analysis and correlation of the measurements and subsequent preparation of a report.

With a large memory of 1Go the **QUADRENT** can measure with the EN50160 integration period duration of 10 minutes for a period of over two months, and also for two years with an integration period of 2 hours, making it suitable for a wide range of applications including Power Quality Compliance, PQ and Load Evaluations both before and after equipment installation, Power Factor correction assessment and Disturbance Analysis.

QUADRENT is a CE marked Category 3 instrument manufactured under **ISO 9001** to the CEI 61000-4-30 class A and EN 50160 standards, and is supplied with all necessary accessories.

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The standard measurement program configured at the factory is detailed below—This can be easily modified by the user
 Star connection, Nominal Voltage 230 Vrms, Nominal current 5Arms, Integration period 10 minutes, Network Frequency 50 Hz.
 Voltage transformer 230/230, voltage hysteresis 10%, current hysteresis 10%.The power quality thresholds are those of EN50160,
 and the bargraphs are 200 to 250 Vrms, power factor 0.5 to 1, frequency 49.5 to 50.5. Harmonics 2 to 24.

RECORDING

Sampling Rate

10240 Hz synchronised to the network frequency.
 Accuracy 10 cycles FFT Freq. Range 30 to 2200 Hz.

Measured Values: -

Mean RMS Values over 200 msec periods

Recorded Values

Over 1 or 10 min., 2 Hrs., 24 Hrs. or 7 Day periods

Current ranges

300, 1000 or 3000 Amps rms selected by front panel knob

Frequency

45 to 57.5 Hz. Res. 10 mHz., Intrinsic error 30 mHz.
 Can be set for 60 Hz.
 Class A according to IEC-61000-4-30

Dips & Swells

1 cycle RMS measurements.
 Rolling window of half cycle
 Reference voltage is V nominal. Intrinsic error <1%
 Class A according to IEC-61000-4-30

Flicker

Pst (10 minutes), Plt (2 hours) to IEC-6100-4-30
 Measurement range 0—20 Intrinsic error <5% of Vnom.
 Class A according to IEC-61000-4-30

Voltage & Current Harmonics

From H0 to H51 measured every 200msec to IEC 61000-4-7
 Recorded Values 10 mins., 2 Hrs., 24 Hrs., 7 Days
 Class A according to IEC-61000-4-30

Imbalance

Class A according to IEC-61000-4-30

Active Power

According to IEC-61036 class 2

Reactive Power

According to IEC-61268 class 2

Power Distortion

According to IEC-61036 class 2

Technical Data

Current measurement inputs

The current is measured with MADE-FLEX Rogowski coils of which two sizes are available

- Loop dia.170 mm., coil dia. 10 mm.
- Loop dia. 90 mm., coil dia. 5 mm.

Harmonics and Inter-Harmonics

The system measures all harmonics up to 51, and IH up to 50. The standard data transfer format transfers those up to 25, and this can be changed to analyse any number of harmonics up to 51 by the user. Where the transfer has been made of up to 51 harmonics, the software displays either 2 to 25 or 24 to 51, and similarly for the inter-harmonics.

Power Supply CATIII - 600 V

Automatically switched between 380/600 Vac for three phase and 85/250 Vac for monophasé.
 The internal battery is charged during use, and will keep the system active for one hour after power failure.

Operating Conditions IP 54

Working temperature 0 to 50°C
 Storage -20 to + 70°C
 Relative Humidity 80% without condensation
H61 Pole Mounted IP43 version, case size 35 x 49 x 20cm.
 weight 6.5 kg without the Quadrent (2.1kg)

Qualification

Safety rules EN61010-1
 EMC NF EN 50081-2 EN55011 Class A

A Calibration check is recommended every two years

Susceptibility to Disturbance

NF EN 50082-2 IEC 1000-4-2 EN 61000-4-2
 EN 61000-4-4 EN 61000-4-6 EN 61000-4-11

Transport

Supplied in carrying case

Dimensions -292 x 181 x 74 mm. **Weight** 2.1 kg.

Supplied Accessories

- 1 3-phase voltage cable
- 1 - single phase voltage cable
- 1 USB interface cable
- 1 current cable with 3 Rogowski-coil current transducers. Choice of 90 mm. OR 170 mm.
- 1 folder with the calibration certificate, user manual & WINQUAD disk & manual