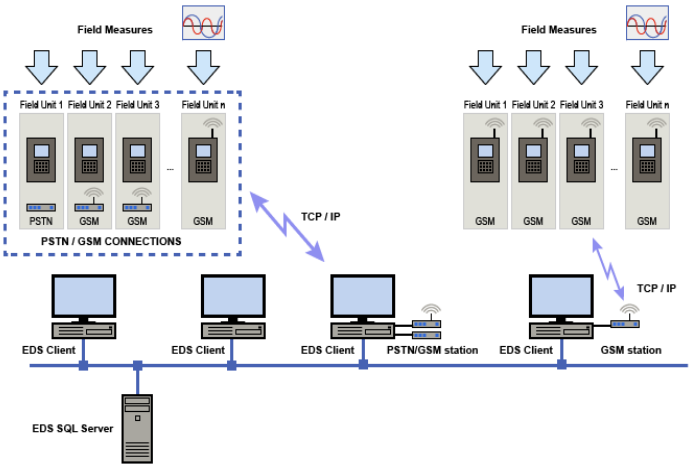


System for measurement and analysis of power quality over distribution networks

System overview

The **PQMAS** system represents the final answer to the Electric Power Quality monitoring requirements on distribution networks according the EN50160 standard. Performances and capabilities of each component make this system a reference point in Power Quality data acquisition system.

The PQMAS main components are:

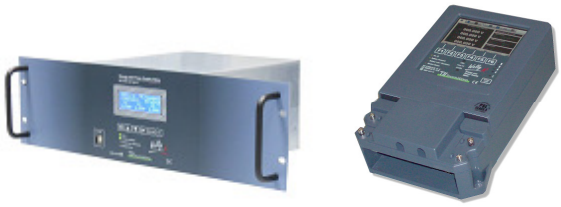
- **WallyA** and **WallyA-RTU** field stations.
- **EDS Client/Server platform** including:
  - EDS Central Server and Supervision station.
  - EDS Local Client analysis stations.
  - EQUALink Field units manager and data acquisition scheduler.
  - EDS SQL/ORACLE database system.
- **EDS_WEB_PRO web based platform**

EDS platforms allows to obtain automatically a complete data collection without operator presence, and permit to use company Intranet/Internet net or GSM/GPRS/UMTS/LTE infrastructures as a vehicle to handling collected data.

Using a powerful SQL/ORACLE, EDS platform organizes collected data coming, automatically or on-demand, from a network of distributed field analysers, making a powerful query platform to extract and analyse the interesting data, according to different selection criteria.

WallyA and Wally-RTU field units are advanced three-phase power meters with full capabilities of energy analyzer, harmonic analyzer and demand analyzer. Fast speed, complete measurement set, powerful interactive operator interface, high size recording capabilities make WallyA and WallyA-RTU references in electric power quality analysis technology.

Field units



WallyA and Wally-RTU field units are advanced three-phase power meters with full capabilities of energy analyzer, harmonic analyzer and demand analyzer. Fast speed, complete measurement set, powerful interactive operator interface, high size recording capabilities make WallyA and WallyA-RTU references in electric power quality analysis technology.

Dual processor architecture allows both high measuring accuracy even on distorted waveforms and powerful data management with real time displaying and monitoring of all measurements. Simultaneous high-resolution sampling of voltages and currents and fast digital processing make it possible a complete “half period power analysis” for 50/60 Hz lines.

Certification

Measurement stations Wally, model Wally A, are certified by internationally accredited laboratory (PSL California), as compliance to EN61000-4-30 Class A devices.

Furthermore, WallyA stations are certified by ENEL Distribuzione Spa compliance with technical specification ENEL DV908.

Measurement and signaling channels

The different types of analog input channels (3/4 voltage channels with common neutral or insulated, 3/4 current channels), 4 digital channels (2 inputs and 2 outputs) are used to interface all the signals of interest on the field.

The devices can be connected to the electricity networks in a variety of ways: direct connection to low voltage networks, indirect connection to LV / MV / HV with external transducers (measuring transformers for voltages and currents, various types of current clamps, etc).

RTC Synchronization

The internal clock synchronization can be achieved either via the connection to the management center either, when is required a synchronization in the order of 10 mseconds, in connection to GTS9000/GST9010 GPS satellite receivers, produced by TW-TeamWare.
This type of synchronization is particularly recommended when it is mandatory to correlate events with no time offset.

Data memory and connections

High recording capacity (from 20MB up to 4GB) allows to extended operational sessions for long time even in the absence of downloading data operations.

The transfer of data was also made, locally or remotely, via modem GSM/GPRS/UMTS/LTE makes easy to establish permanent monitoring systems in distribution networks.

The integrated Ethernet controller allows you to install the instruments as normal peripheral within a LAN for fast data transfer.

The LAN connection also allows you to enable fast connections via ADSL modem (external).

Power backup

It is available a backup system that allows to buffer a power failure from 10 to 40 minutes, depending on the device model, allowing proper management of measures and events in critical situations of the auxiliary power supply.

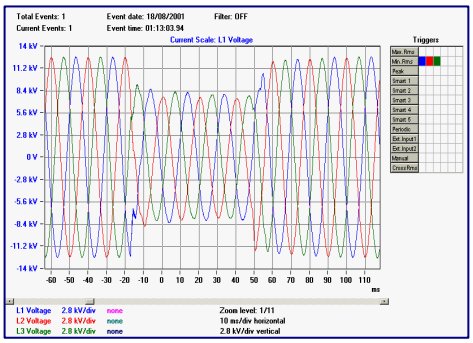
Download e remote control functions

The open architecture allows for immediate update of peripherals from the user, through an interactive procedure that handles both download from the TW-TeamWare website and by local connection.

Wally and Wally RTU measurement stations are the synthesis of the TW-TeamWare many year experiences in the realization of systems of measurement and analysis of electricity, and are the most advanced response to the needs of reliability, efficiency and completeness of the information, necessary to try and win the challenges of the technological society.

Power Quality Analisys EN50160 compliant

The VQMX application module gives to the field units the performance of a measuring instrument able to acquire and process the large number of parameters required by EN61000-4-30 and EN50160 standards: slow and fast voltage changes, voltage dips, interruptions, overvoltage, unbalance, frequency variations, voltage and current harmonics, inter-harmonics and flicker.
To complete the analysis of the behaviour of the network and connected systems, you can record additional information such as: currents, active / reactive / apparent power and energy, waveforms and rms trace (rate 10 msec) for each event.



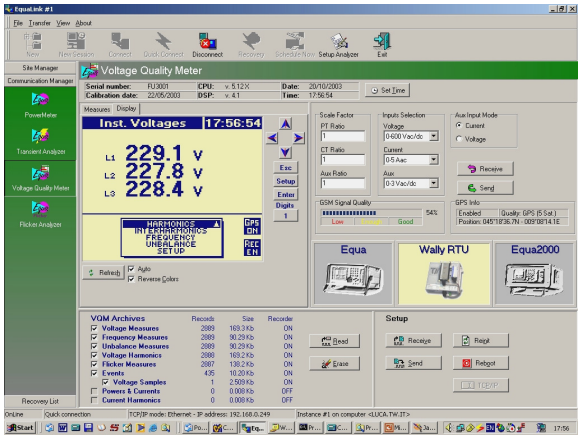
Upon detection of significant events it is possible to send spontaneous messages from devices vs. management center, executing an automatic update of the database. Furthermore it is possible to send email with events information to a list of name editable by system users.

EDS Open platform

EDS platform is an innovative and flexible application specifically designed to manage data collected by a network of Wally analysers or other peripherals able to generate data file in PQDIF format.

Made in typically Client/Server or new Web-based architecture, it uses the corporate intranet or the Internet, or other communication vectors (GSM/GPRS/UMTS/LTE) to perform a complete automatically data acquisition from peripherals, without users intervention, simplifying the management of large amounts of data.

Designed specifically for the Utilities, EDS platform organizes data collected by network analysers in a SQL/Oracle database, providing the user with a powerful platform for the selective analysis of the relevant data with production of event lists, graphs, tables, statistical classifications, specific reports.



EDS_Enterprise main features

- Client/Server or WEB-based architecture
- Powerful SQL or Oracle Database
- Password access with different user profiles
- Concurrent operations from different clients
- Search functions by site, type of measure, event, date, time, event duration.
- Extraction of multiple sets (from the same and different analysers) with production tracks, charts and reports.
- Temporal correlation of events.
- Statistical classifications and data view
- EN50160 compliant measures
- CBEMA, ITIC, EN50160, UNIPEDE reports
- Automatic or manual data entry
- Compatible with all Wally family analysers
- Compatible with non-proprietary PQDIF data format devices
- Custom solutions

PQMAS Users

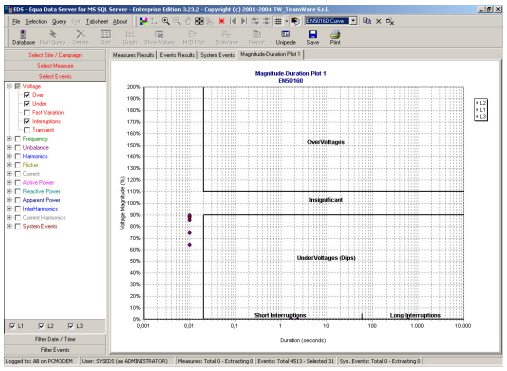
- Electric Utilities: supervision of transmission and distribution EHV / HV / MV networks
- Electric Utilities: control transformer substations and delivery points
- Industrial Centers and Hospitals
- Plants susceptible to Power Quality Problems
- Consultants

Applications

More than 3000 measurements stations installed make PQMAS one of the most used power quality monitoring system.

Among the more complex applications we can mention:

- ISRAEL: PQMAS system for MV network monitoring, with 250 Wally-RTU stations
- ITALY: PQMAS system for MV network monitoring, with 600 Wally-RTU stations
- ITALY: PQMAS system for RTN HV network monitoring, with 200 Wally-RTU stations
- ITALY: PQMAS system for MV network monitoring, with 1500 WallyA-RTU stations



Dips Depth/Duration	t > 0 ms t <= 10 ms	t > 10ms t < 100ms	t >= 100ms t < 500ms	t >= 500ms t < 1s	t >= 1s t < 3s	t >= 3s t < 20s	t >= 20s t < 1m
85% <= V < 90%	8	8	1	0	0	0	0
70% <= V < 85%	3	4	0	0	0	0	0
40% <= V < 70%	1	1	0	0	0	0	0
1% <= V < 40%	2	2	14	0	0	0	0

Interruptions Depth/Duration	t < 1s	t >= 1s t < 3m	t >= 3m
0% <= V < 1%	164	239	23

Over Voltages Overvoltage/Duration	t < 1s	t >= 1s t < 1m	t >= 1m
110% < V <= 120%	8	0	0
120% < V <= 140%	1	0	0
140% < V <= 160%	0	0	0
160% < V <= 200%	0	0	0
V > 200%	0	2	0

TW-TeamWare Srl
Via Pindaro, 19
20128 Milano - Italy
Tel. +39 02 27003261
Fax +39 02 27007753
email tw@teamware.it
web www.teamware.it