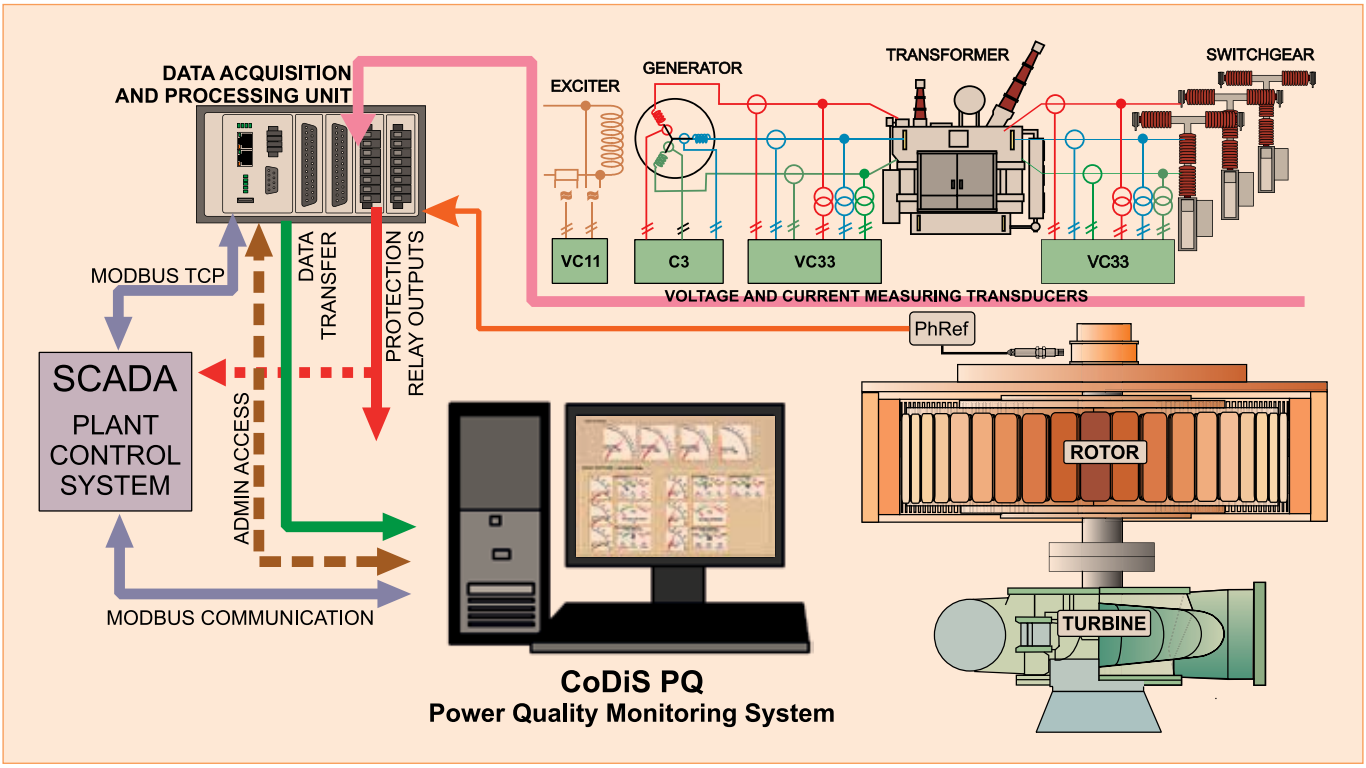
CoDiS PQ Permanent Power Quality Monitor and Transient Recorder

CoDiS PQ system provides permanent electrical quantities vector monitoring and generator (motor), block transformer, switchgear and grid electrical transients recording. The system includes recorded transient waveforms analysis toolbox.

It is usually deployed as part of **CoDiS DM** vector diagnostic monitoring (along with vibration, air gap, and hydraulic quantities).



CoDiS PQ Available measurements:

- generator (motor) and grid voltages and current signals
- generator (motor) excitation voltages and current signals
- rotation speed and shaft position reference (single and/or multiple pulse per revolution)
- rotor dynamics measurement signals (relative and absolute vibrations, axial displacement)
- process signals (water head, flow, pressures)

CoDiS PQ basic electrical values are measured using Veski VC33 (multi-channel) or VC11 (single channel) voltage and current measurement transmitter blocks, which are a part of the standard system configuration.

CoDiS PQ is storred into single **CoDiS** Machine Condition Monitoring database for correlation with other monitoring modules.
The database contains:

- generator (motor) and grid phase **voltages and currents mean square values (RMS)**
- generator (motor) and grid **phase voltages and currents total harmonic distortions (THD)**
- generator (motor) and grid **voltages and currents phase relations**
- generator (motor) and grid **voltages and currents base frequencies**
- generator (motor) and grid real and imaginary powers, **power factor (cos φ)**
- generator (motor) **load angle (δ), common total harmonic distortion (THD)**
- additional condition vector components calculated according to customer defined system configuration

CoDiS PQ functionality provides following tasks:

1. continuous data acquisition with user defined pre- and post-trigger waveform lengths applying ring-buffer
2. continuous calculation of condition vector components, standard and user defined
3. continuous calculation of trigger conditions and comparison with user defined triggering limits
4. recording condition vector components into system data base
5. recording waveforms into waveform data base if triggering conditions are met, with basic data (date, time, trigger condition, max value) in order to simplify selection of waveforms

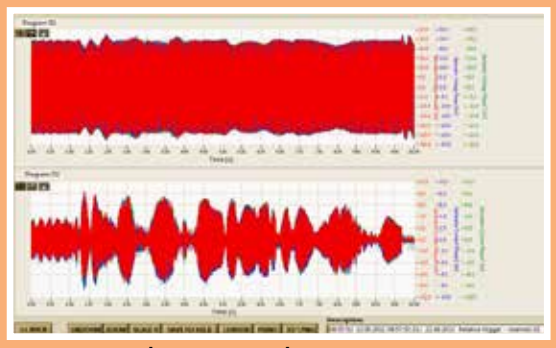
CoDiS PQ data analysis and displays provide:

1. on-line display of current data
2. short term trends of condition vector data
3. recorded waveforms selection according to basic identification data
4. trend analysis toolbox - performing analysis of **CoDiS PQ** trend data and combining them with **CoDiS DM** data (e.g. vibration, air gap or flux data)
5. waveform analysis toolbox - performing analysis of **CoDiS PQ** waveform data in time- and frequency domain for single record
6. waveform cross-analysis toolbox - performing cross-analysis of multiple waveforms (e.g. power flow during transient)

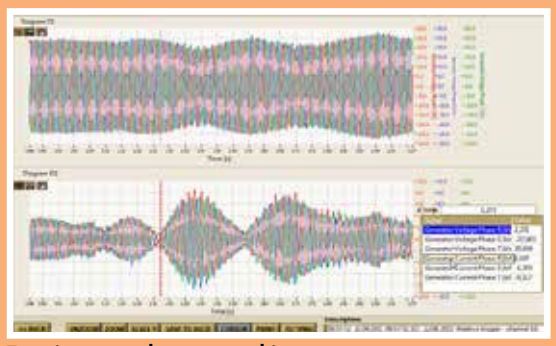
CoDiS PQ system standard coinfiguration:

- 2 x VC33 (3 voltages and 3 currents), 1 x C3, 1 x V1 and 1 x C1 transmitter
- 1 x speed/position reference sensor
- Data acquisition processing unit with up to 32 analogue inputs (additional inputs and outputs optional)
- Standard version of firmware and software

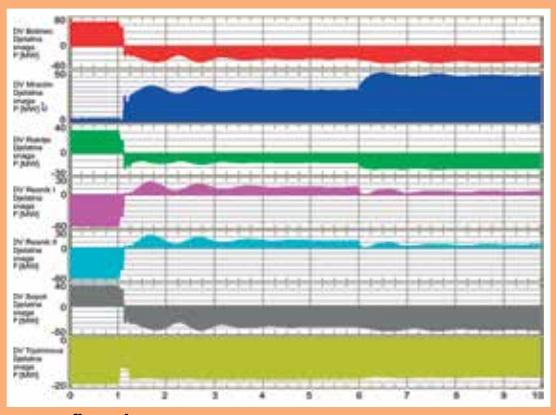
Power quality / on-line display



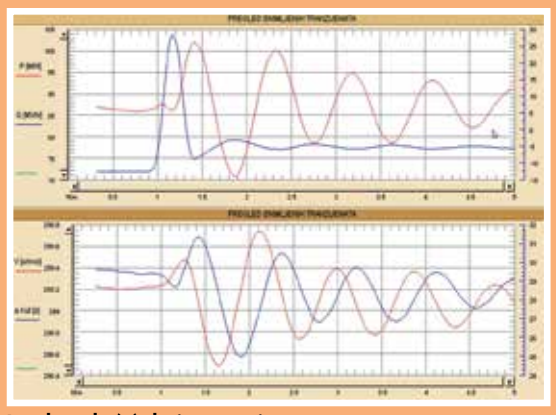
Transient recorder - 10s record



Transient recorder - zoomed in



Power flow during transient event



Load angle (δ) during transient event