



Power Measurement Application Note

Customer: **Electrical distribution and automation
Division Solar**

The customer is manufacturer of electrical equipment mainly for the energy sector. In the division of solar they provide complete solutions for photovoltaic integration. They have several test bays for analysis of the photovoltaic systems, starting from the DC output of the solar panel up to the grid connection.

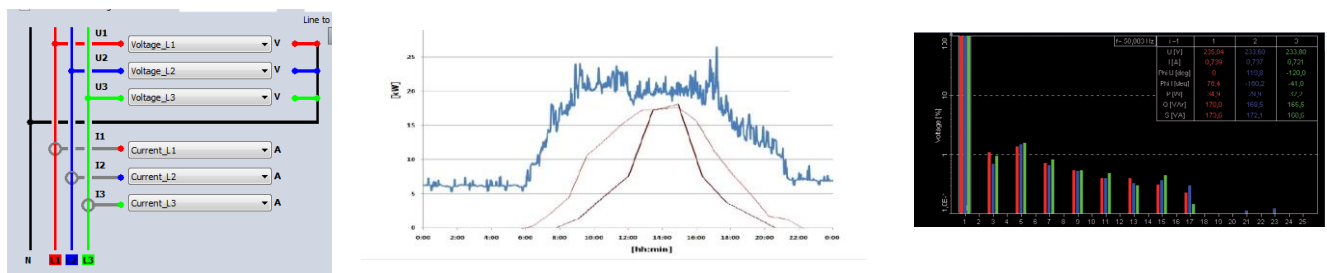
They want to do a number of analysis at the test-bench like efficiency determination, harmonics analysis, energy generation, profiles of the power generation etc. at different ambient conditions and different operation situations. Beside the data acquisition of voltage and currents they also want to connect video and infrared cameras, temperature-, humidity- and pressure sensors to the measurement device. There are all in all more than 130 sensors connected to the different measurement devices at all five test-bays. It is possible to do the data acquisition of all signals at all test-bays completely synchronous with the full sampling rate.

They need to do the calculation of the electrical power for different wirings like one phase, three phases, DC and also for different frequencies during measurement. Furthermore they want to do a lot of mathematical operations (filter, statistics, correlation, classification, arithmetical- and trigonometric functions) already during the measurements.

Challenges and Requirements

- Synchronisation of all measurement devices at all test bays
(5 Test bays, more than 130 sensors)
- High sampling rate
- High bandwidth for the whole measurement chain
- Synchronous data acquisition of voltage, current, temperature, humidity, pressure and video
- Synchronous power calculation for different frequencies and wirings

Software: Dewesoft



Picture 1: Screenshots for Wiring, power generation and harmonics measurement



Hardware:

- 3 x DEWE-800 and DEWE-30-16
 - 1 MS/s A/D card
 - 11 x HSI HV modules for voltage input
 - 7 x HSI-LV module for current transducer input
 - 16 x inputs for temperature, pressure, humidity...
- 1 x DEWE-800
 - 100 kS/s A/D card
 - 6 x HSI HV modules for voltage input
 - 3 x HSI-LV module for current transducer input
- 1 x DEWE-800
 - 100 kS/s A/D card
 - 6 x HSI HV modules for voltage input
 - 9 x HSI-LV module for current transducer input

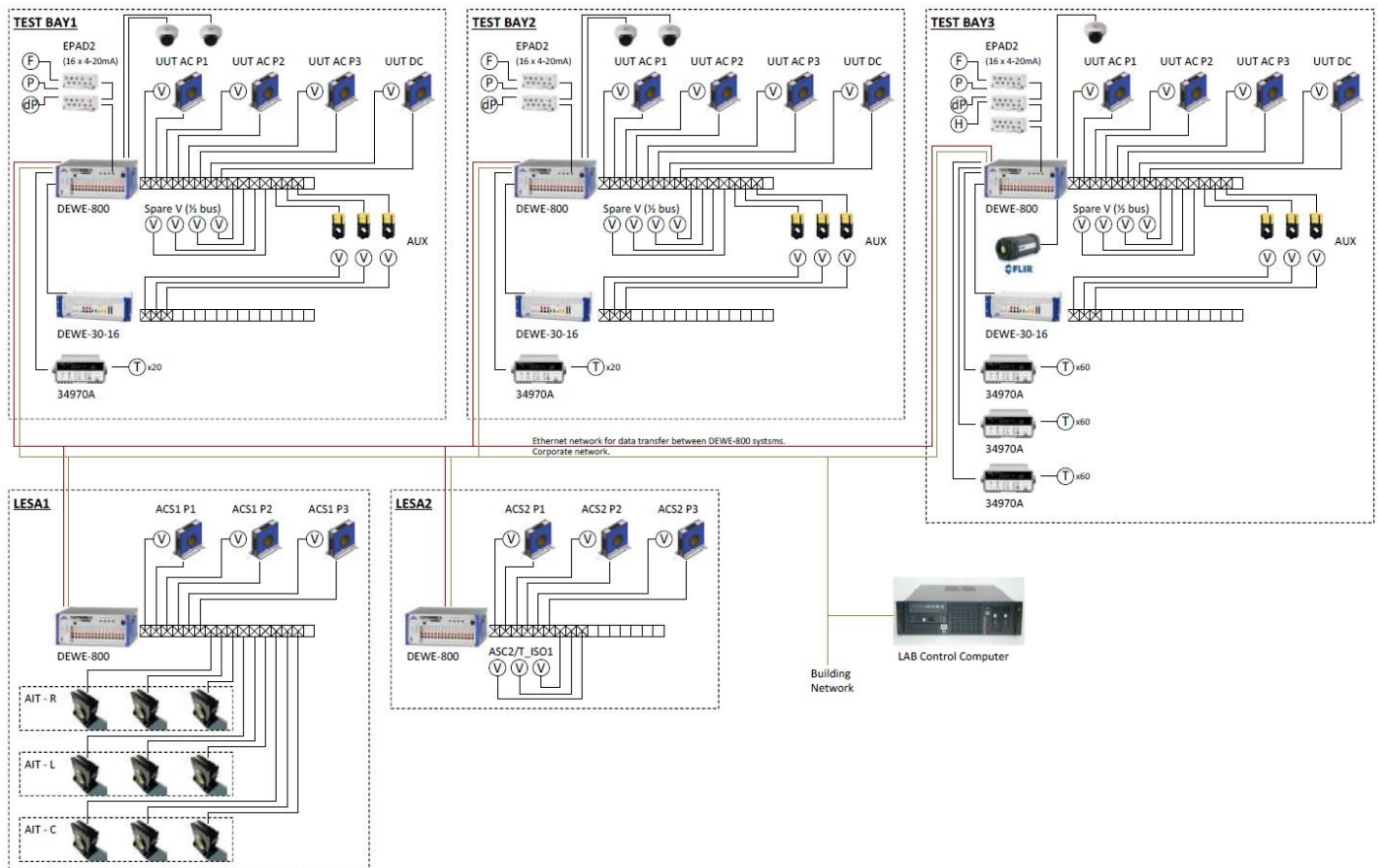


Picture 3: DEWE-800 measurement device



Picture 2: DEWE-30-16

System Overview:



Picture 4: System overview at the customer side