



Power Measurement Application Example

Customer: Power inverter manufacturer (leading manufacturer)

The customer is manufacturer of power inverters mainly for urban trolley busses and rail public transport services but also for other applications. At the test-bench they do detailed analysis at the power inverters, the motors and the whole powertrain. On one site, they analyse in detail the PWM generation and need therefore highest sampling rates, high bandwidth and highest accuracy for the whole measurement chain. On the other site, they do also efficiency measurements and need therefore power measurement at multiple points (3-phase star and delta, 2-phase, 1-phase and DC) and also with different Frequencies (variable, 50Hz, 60Hz, 16,7Hz, 400Hz, 800Hz). Additional measurement channels for mechanical parameters (torque, speed, etc.) and ambient parameters (temperature, humidity, etc.) are required. All in all there are 24 channels which have to be measured completely synchronous (with 2 MS/s Sampling Rate).

Further requirements are the online efficiency determination of the inverter and a number of further calculations via the Math-Library and the Power Plugin. For detailed analysis they use the post-processing function provided by the software.

Challenges and Requirements

- High Bandwidth of whole measurement chain
- High Sampling rate (up to 10 MS/s)
- Synchronous acquisition of 24 channels (with 2 MS/s Sampling Rate)
- Online - Efficiency Determination and calculation of different parameters (Math)
- Post-Processing for detailed analysis

Software:

Picture 1: Example Screen of the software for an Inverter-measurement powered by the grid (3-phase)





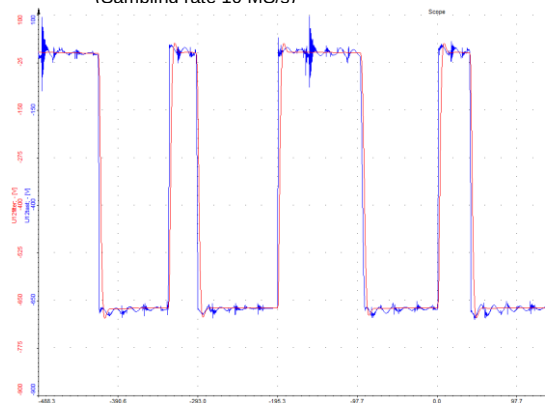
Hardware:

- DEWE-2600 measurement unit
- 3 x 10 MS A/D card with 8 channels
- 8 x Full-isolated high voltage Inputs (1400V rms)
- 8 x Full-isolated low voltage Inputs (50V rms)
- 8 x connectors (direct to A/D card)
- Digital Inputs for Status Signals

Picture 2: Measurement Device DEWE 2600



Picture 3: Screenshot of the PWM-signal of the inverter (Sampling rate 10 MS/s)



Picture 4: FFT and vector scope of the inverter and the grid

