Acquisition of Frequency and Digital Signals with SIQUAD

The computer-controlled measurement system SIQUAD has modular 2- and 4-channel amplifiers for strain gauge, temperature, ICP® sensors, DC voltage and current, and also frequency signals. Sample rates of the amplifiers are up to 20 kHz per channel. AD conversion is done with 24 bit resolution, digital data output with 16 bit. Calibration data and the complete parameter settings are stored in a flash EPROM. All channels are isolated and work synchronous.

Up to 16 plug-in modules fit into a 84 unit 19"-rack or (mobile) housing. Sensors are connected from the front side. The total sample rate per housing, i.e. for up to 64 channels is approx. 500 kS/s. Several systems can be interlinked (synchronous) via the Ethernet interface to some 100 channels.

The system is also suitable for CAN communication. Each amplifier has an integrated CAN controller on board to broadcast measurement data directly to a CAN bus. A plug-in interface unit is optionally available for acquiring data from a CAN bus to be processed synchronous with the other measurement data by DAQ software.

For processing frequency and digital signals the following plug-in cards are available: ISO-FU-S2, DIO-8-D and DIO-8-Z4-D.

ISO-FU-S2 (2-channel) amplifier has been developed for conditioning of arbitrary periodic frequency signals. Each channel handles 2 differential AC-coupled tracks and has a back-end fourfold adjustable amplifier stage. This allows to measure signal amplitudes from $500\ mV_{pp}$ to $100\ V_{pp}$. In addition there is a digital input, e.g. for synchronisation pulses. Sensors are fed per channel by an integrated isolated power supply.

A moving average function can be selected over 1, 2, 4, 8, 16, 32, 64, 128, 256 values. A comparing function is set by software for the full range, as well as comparator-hold and first value reporting, overload and overload-hold. A frequency range of 5 Hz to 1 MHz is covered in FU mode, in incremental mode 100 to 1 million pulses are counted (maximum counter frequency is 1 MHz).

DIO-8-D is for processing of up to 8 digital input signals (high level 3.5 to 60 V, low level –30 to + 1 V, sample frequency 20 kHz), and enabling of 8 relay outputs (max. 2 A, 220 V). The inputs are optically decoupled. Relay outputs can be set by jumper per channel to make or break. Switching states are indicated by the front panel LEDs.

The version DIO-8-Z4-D allows in addition configuring of the inputs also for basic frequency input and conditioning of digital frequency signals. Up to 4 frequency inputs per unit are feasible, which can be set to FU mode (5 Hz to 1 MHz) or incremental mode (100 to 1 Million pulses).