Q-MOD
Process monitoring

Your application:

Resistance welding equipment (AC, 3-Phase DC, medium frequency or capacitor discharge)

- Single spot or serial spot welding
- Projection welding
- Other special resistance welding applications

The existing welding controller has no or not sufficient measuring functionality for process control and monitoring. Your customers ask you more and more to monitor your process and assure process transparency.

Your requirements:

You want to retrofit your welding equipment with an external process monitoring system for quality control. The measured process data should be stored via PC. The solution must be cost effective, easy to install and easy to manage.

Our answer:

The Q-MOD is a measuring module specially designed for the process monitoring of resistance welding applications. The standard Q-MOD has 2 measuring channels. There is the opportunity to combine two modules so that you will have 4 measuring channels simultaneously. With one module two or four measurands can be monitored simultaneously. Alternatively the following measurands can be processed.
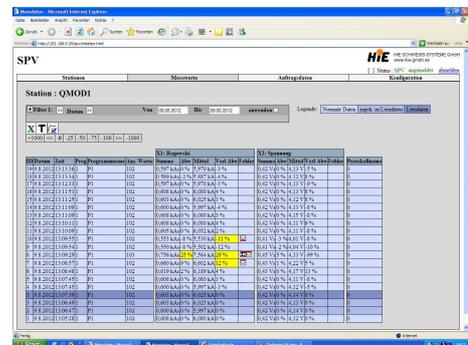
- Rogowski signal (secondary current)
- 0-10V analog signal (primary current, voltage, pressure, force)
- 5V TTL signal (path)

Up to 8 different free programmable monitoring programs can be stored in the internal memory of the Q-MOD. The data of the reference welding is also stored in the related monitoring program. If the monitoring mode is activated the Q-MOD will measure the actual process data and compare them with the process data of the reference welding. If one of the monitoring limits ore envelop curves will be violated the Q-Mod will give an error message and the corresponding data file will get an error mark.
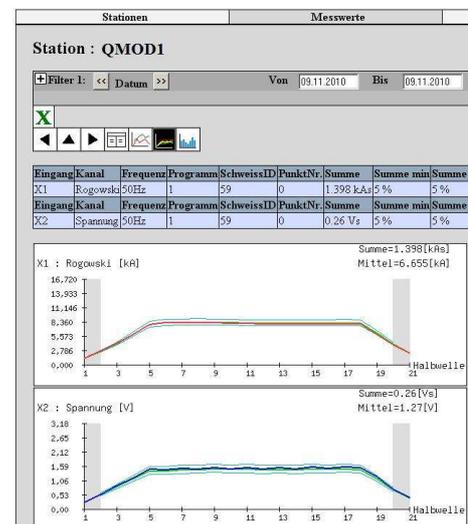
The Q-MOD has 4 digital outputs and 2 digital inputs. Functions like *start monitoring*, *new reference*, *quit message*, *program selection* and *error message* can be allocated to these I/O´s. By CAN interface there are more possibilities to communicate with the control unit of the welding equipment.

The Q-MOD is equipped with a LAN-interface. Via this LAN-interface the Q-MOD can be connected to a PC-Server. The software for the configuration and data transmission is installed on the Q-MOD itself. Operating and configuration is done by a web browser as *Internet Explorer*. The whole communication is based on TCP/IP. On the PC-Server a FTP-, Apache- and My-SQL server must be installed..

Several Q-MOD can be part of a monitoring network. The administration and visualization of the collected process data is done by the SPV-Software. This software is also a product of HIE and belongs to the scope of supply.

Technical specification

Measuring inputs:	2 measuring inputs with 9-pole sub-D socked
Measurands:	- Rogowski signal (secondary current) → only channel 1 - 0-10V analog signal (primary current, voltage, pressure, force) → channel 1 and 2 - 5V TTL signal (path) → only channel 2
Monitoring functions:	Up to 8 different programs with monitoring settings as min/max limits for sum- and average values as well as envelope curves
Interfaces:	- LAN-interface (100 Mbit) - 4 free programmable digital inputs and 2 free programmable digital outputs for external start, coding of programs or trigger for output signal when a monitoring limit has been reached. - CAN-interface (optional) - W-LAN bridge (optional)
Power supply:	24V DC
Dimensions (WxHxD) mm:	Compact case 126x125x50 mm (without plugs) Double case extension by 2 channels or W-LAN bridge 226x125x50 mm (without plugs and antenna)
Weight:	Compact case approx. 0,5 kg Double case approx.. 1,0 kg

Complete Q-MOD system mounted in a control cabinet:

For fix installation on a welding machine it is recommended to install the system in a control cabinet. The Q-MOD control cabinet includes all necessary devices except the sensors. The operator can manage the general functions of the monitoring process by a program selection switch and non locking keys. The confirmation of error signals can be locked by a locking switch. A three color signal column indicates the status of the monitoring system. The transparent cabinet door makes it easy to monitor the status LED´s of the interface module and the measuring module.