Fast and reliable measurement data acquisition in power plants

both during maintenance and during an emergency

Fig. 1: Power plant Niederaußem/ Bergheim

Service and maintenance departments in power plants all over the world are faced with difficult tasks in relation to their measurement systems. Above all, solutions must be implemented for mobile use and as many different signals as possible must be acquired and measured with one measurement device.

imc Test & Measurement GmbH has developed its innovative and compact imc measurement system case especially for this area of application.

The customer

The measurement case is tailored to companies with several power plants. This allows the cases to be transported quickly and easily between power plants. The focus is on flexibility and maximum efficiency in order to continuously maintain and renew power plants.

The situation

For power plant operators, flexibility and mobility are of the utmost importance today. Systems must be easy to handle and work very efficiently at the same time. The imc system combines these features and is therefore indispensable in the modernization of power plants.
An imc CRONOS measurement system was used, which is designed for power plant operation with the aid of a special case and other special modifications. It measures various signals for machine control, e.g., pipe line pressures, guide wheel and ball valve positions, temperatures and many more.

The solution

Our suggestion was to use a compact, universal and standard imc measurement system having 16 isolated analog inputs, 16 digital inputs, 4 relay outputs and 4 incremental encoder inputs.

Fig. 2: imc CRONOS*compact*

The system was a good match for the application in terms of design, channel count and functionality. However, due to the power station's environment, there were additional requests as well:

- Flexible connection to the measurement channels via the existing factory D-SUB connectors using appropriate cable adapters wouldn't be practical, because it would require a variety of different (special) types of connectors and cables to be stored.
- In addition, the system should have the possibility to supply auxiliary power to external actuators.
- And last but not least, it should be possible to comfortably transport everything, including a laptop and all necessary test accessories.

On the basis of these three requirements, the measurement case was planned and designed.

Fig. 3: imc measurement system case

The mobile measurement system

The ruggedly designed transport case with outside dimensions of 520mm x 435mm x 230mm has adequate space in the upper area to store a laptop and measurement accessories.

According to customer request, you can close the lid even when test leads are connected to largely protect the measurement system against environmental contaminants.

On one hand, this custom measurement case safely accommodates the selected measurement system with an adequate power supply up to 5A, and on the other hand it provides a connection panel to hook up the process peripherals via the standard connector systems of the customers.

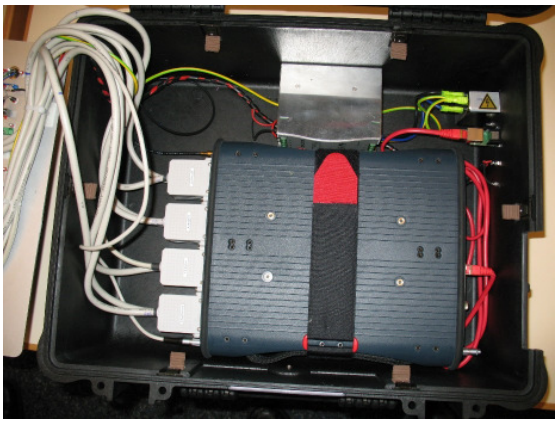

Fig. 4: Measuring system and cabling in the case

The connection panel is structured channel by channel. Each analog input channel is equipped with a DIN-socket with bayonet lock, 2mm miniature sockets, a switch for temperature/voltage and current measurement (-20mA ... 20mA) and a Combicon® connector block.

With this setup, maximum flexibility is ensured regarding connections with the control cabinets in the power stations without sacrificing clarity or functionality.

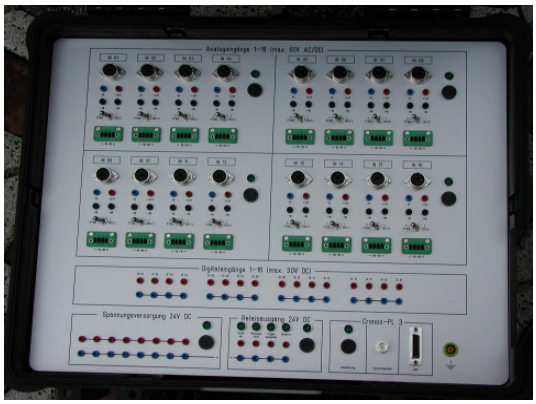

Fig. 5: Connector panel

The digital inputs and relay outputs are also wired to 2mm sockets in the panel and the incremental encoder inputs to a D-Sub socket connector.

For supplying auxiliary voltage to relays or other actuators, a variety of other connection options are available.

The power supply to the measurement device and the connection to the communication interface take place from the outside through an insulated connector with a fuse and a push-pull connector with IP67 rating.

The configuration of the measurement system is based on user-friendly, standard measurement software that allows rapid configuration of different measurement tasks. Various applications such as multimeters, loggers, recorders and much more are covered with only one system.

System implementation

imc measurement device	Qty.
imc CRONOS-measurement system 16 isolated analog inputs, 16 digital inputs, 4 relay outputs and 4 incremental encoder inputs	1
Measurement case	
520mm x 435mm x 230 mm with space in the cover for a laptop and measurement accessories; Cover can be closed with all cables connected	1
Connector panel	
DIN-socket with bayonet lock	1
2mm miniature sockets for analog input channels	16
Switch for temperature/voltage and current measurement (-20mA ... 20mA)	1
Combicon® connector block	1
Digital inputs and relay outputs: 2mm sockets	20
Incremental encoder inputs: D-Sub socket connectors	4
Power supply	
Power supply up to 5A, exterior connection through an insulated connector	1
Variety of connection options available for the auxiliary supply of relays or other actuators	
Communication interface connection	
Push-pull connector with IP67 rating	1
imc Software	
imc Online FAMOS Pro Real-time data analysis platform for imc CRONOS devices	
imc STUDIO Pro Comprehensive measurement software for the entire test process: measurement, visualization, automation, data analysis	
imc FAMOS Enterprise + imc FAMOS Pro Data post-processing, analysis and visualization	

Results

In the case of a failure or emergency, as well as in performing preventive maintenance in power stations, having handy and manageable measurement equipment is essential to detect system problems quickly and reliably. Therefore, working in close cooperation with our customers, we developed an easy-to-transport, flexible measuring kit, exactly tailored to the process environments that can be used comfortably to perform temporary or permanent measurements on machinery control circuits and fixtures in the power stations.

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imc Test & Measurement GmbH is a manufacturer and solution provider of productive test and measurement systems. imc implements metrological solutions for research, development, service and production. imc has particular expertise in the design and production of turnkey electric motor test benches. Precisely outfitted sensor and telemetry systems complement our customer applications.

Our customers from the fields of automotive engineering, mechanical engineering, railway, aerospace and energy use imc measurement devices, software solutions and test stands to validate prototypes, optimize products, monitor processes and gain insights from measurement data. As a solution provider, imc offers their customers an attractive and comprehensive range of services. These include project consulting, contracted measurements, data evaluation, specialist deployment, customer-specific software development and system integration. imc consistently pursues its claim of providing services for “productive testing”.

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