

Quality Management for Machinery and Equipment

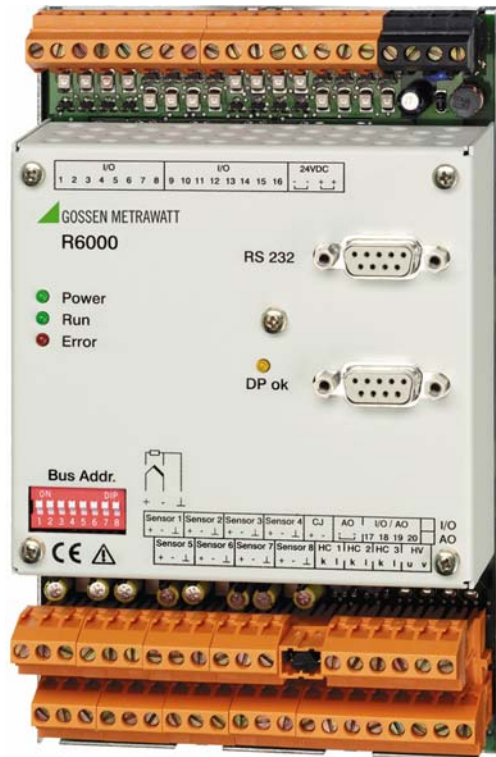


Figure 1: R6000 8-Channel Temperature Controller with Standardized Bus Interfaces for CAN-Bus, Profibus-DP and RS 485

Quality management in complex machinery and equipment would be inconceivable in today's world without systematic error analysis and convenient error diagnosis. In many applications, the quality of temperature regulation has a direct influence on the quality of the manufactured product. Amongst others, standardized methods for monitoring temperature include checking for reversed polarity, failure and short-circuiting of the temperature sensor, utilization of the regulated temperature in the event of sensor failure, actual value correction for temperature sensors and the detection of heater, cooler or actuator failure.

For this reason, GOSSEN METRAWATT has created additional options for process monitoring and report generating with time stamp by integrating a data logger, an alarm history and a mapping function.

R6000 8-Channel Temperature Controller

The R6000 compact 8-channel temperature controller provides concentrated control technology know-how in a rail mount housing, generates new control variables for all 8 channels within a period of 100 ms, and monitors heating current without interrupting the regulating cycle. The autonomous controller can be very quickly configured, and adapts itself to the utilized control systems by means of self-tuning. Outstanding control performance is achieved by means of GOSSEN METRAWATT's own dead-beat PDPI algorithm, which even assures outstanding results for critical applications in the field of plastics processing machinery manufacturing.

Quality Management for Temperature Monitoring

As a rule, thermal processes are restricted to defined temperature ranges. If these ranges are exceeded or fallen short of, a warning is usually required. Monitoring functions generally include limit value monitoring (actuation suppression / alarm memory), heating circuit and heating current monitoring, performance in the event of sensor failure and monitoring of binary outputs or any given device error. Traditionally, for example, limit values are specified and compared with the actual value. A message is transmitted to the user or an interconnected system by means of various output options as a channel-specific alarm or a group interrupt.

Data Logger

The data logger function provides the user with the opportunity of evaluating actual values and manipulated variables in the event of an error. The data logger has enough capacity for 3600 sampled value pairs including actual values and manipulated variables for all 8 channels. Data recording is restarted each time the device is reset.

The data logger's sampling cycle can be set within a range of 0.1 to 600 seconds, which results in a recording duration of 6 minutes to 25 days. Data can currently be accessed via the RS 232 or the RS 485 interface (EN60870 or Modbus protocol).

Alarm History

The alarm history makes it possible to acquire the channel or the device error status with time stamp, as well as output errors. The alarm history includes 100 error status entries with respective time stamps. Data recording is restarted each time the device is reset.

Data can currently be accessed via the RS 232 or the RS 485 interface (EN60870 or Modbus protocol).

Mapping

This function is used to test for correct wiring of the heater and the sensors. Assignments can be checked when the machine is started up before initial heat-up. Testing is conducted in several phases in order to determine whether or not the temperature changes at the individual channels coincide with the actuating signals. If an error is detected, all actuating outputs remain inactive until the error has been acknowledged.

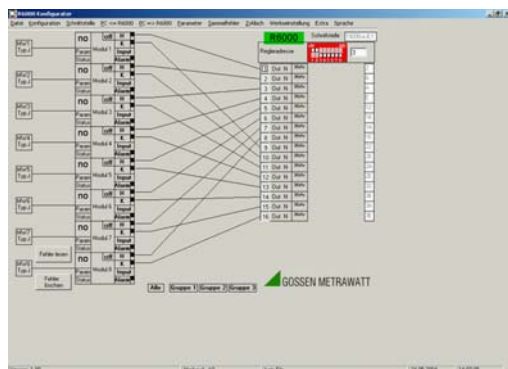


Figure 2: R6KONFIG Configuration Tool for the R6000

Conclusions

Systematic problem solving techniques provide key support for the elimination of errors. By comparing possible errors with their possible causes, it is easy to recognize that any given error might have several causes within the process. The additional functions furnished with the R6000 controller place further options at the disposal of the user for fulfilling demanding quality requirements. Areas of use include injection molding, extrusion, blow molding and hot runner technology, as well as applications in the fields of pharmaceuticals and textile machinery manufacturing.

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