



PC-based detergent production control

Optimized quantity and quality

→ Industrial Automation and Control Systems N. Sofikitis, based in Athens, Greece, specializes in the integration of industrial motion and process management systems for the chemical industry and other sectors. Applications of this type require a high degree of reliability and flexibility. For detergent manufacturer, Eurochartiki S. A., based in Aspropyrgos, Athens, Sofikitis designed a control system consisting of a Beckhoff Industrial PC and I/O components.



A chemist carries out quality control tests in a laboratory.

Chemical processes require high accuracy and coordination during the mixing of different ingredients. Under laboratory conditions this is an easy task, since specialized staff are available and only small quantities have to be dealt with. In mass production, however, the conditions are very different and a wide range of production parameters such as weight, pH value, recipe quantities, viscosity, temperature and color have to be taken into account, making the task very complex.

Three-part production process

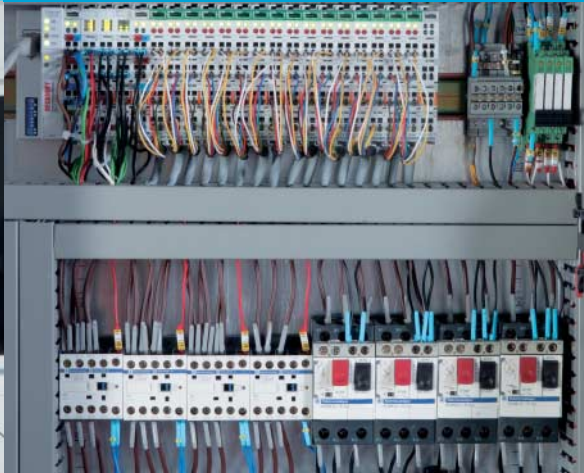
Eurochartiki S. A. required a control system for their production plant that could deal with these tasks reliably and was flexible enough to enable integration into existing quality control equipment. The production process is divided into three



Main control cabinet with Control Panel.



Batch silos



Control Panel running the SCADA software with SQL process monitor.

Beckhoff automation components:

- | Control cabinet Industrial PC C6140
- | TwinCAT PLC
- | TwinCAT Modbus TCP Server
- | Bus Coupler: 3 BK9000 Ethernet Bus Couplers
- | Bus Terminals: various digital and analog I/Os, including 32 KL3356, 1-channel precise resistance bridge evaluation

stages: The pre-production stage where the production manager decides how many batches will be produced per day, the production stage where the technicians monitor the automated process and the post-production stage where samples are taken and subjected to several quality control tests in the chemical lab. These processes are controlled by a C6140 Industrial PC with TwinCAT PLC software and Bus Terminals as the I/O system via a real-time Ethernet network. IAS, L. J. Skourgialos, the Beckhoff partner in Greece, provided support for Sofikitis during the implementation of the control system.

Process monitoring via Ethernet

The decentralized SCADA client enables production monitoring and control via Ethernet. Each of the individual silos can be assigned batches via the SQL database, in which the recipes are stored. The production process then commences. The SCADA system provides detailed information about the batch data and the technicians can start the process from any silo Control Panel, which serves as the user interface. These user interfaces are operated via the TwinCAT Modbus TCP/IP server and Ethernet. Depending on their user level, production technicians can modify recipes during production, for example, by adding an ingredient, changing its weight, or removing it altogether. Such modifications are permitted because ambient conditions have significant influence on batch quality in chemical production and processes. Once the production process is completed, a sample is taken and several quality control tests are carried out in the chemical laboratory.

“The Beckhoff control system we use for detergent production has led to an impressive improvement in terms of quality and quantity for all production parameters,” said Constantinos Tentas, production manager at Eurochartiki.