

PC Control and EtherCAT help improve production processes

Accurate concrete production boosts competitiveness



With traditional hand-operated concrete mixers, quality was mostly left to chance. Today, mixing and producing concrete requires accurate control of the individual process steps, precise dosage of the various materials for different recipes, recording production data and monitoring the condition of the machines. The Danish firm Skako A/S, manufacturers of ready-to-use systems for the ready-mix concrete and precast concrete component industries, uses Beckhoff control technology for this purpose.

Skako, with headquarters in Faaborg, Denmark, supplies system technology for manufacturing concrete, both as standard solutions as well as in client-specific configurations. The company's range of applications extends from large, complex turnkey projects right down to small, simple mixing systems with a capacity of 1/2 to 3 m³. Furthermore, Skako also supplies conveying systems such as transport vehicles and conveyor belts for liquid concrete.

The systems are mostly used for stationary operation on land, but can also be used in deep water without any problems. For example, Skako has supplied offshore concrete batching plants for casting the pylons and pillars for diverse bridge projects (Öresund, The Great Belt).

Effective control and documentation

The batching plants are controlled via the Skakomat 600 SQL system developed by Skako. It processes the recipes, adjusting them to the composition of the materials by means of continuous calculations. The necessary process data is recorded, using scales, flow and moisture gauges, etc. at various points in the system. "Our customers depend on maximum data security and operational reliability," explains Skako electrical engineer, Ejvind Jensen. "These guarantee both the Beckhoff control components and the SQL database for local data backup as well as the RAID controller with two hard disks. If one hard disk fails, the other takes over process control automatically."

Jørn Lindmann Jensen of Beckhoff Denmark and Ejvind Jensen from Skako in front of a Skako mixer



Moreover, the system offers complete data tracking and process control as well as the monitoring of key functions, with the result that the operator is informed about possible faults immediately. The Skakomat 600 enables the complete automation of all the processes: ordering, dosage, mixing and delivering together with all the accompanying documentation. "The system is configured so that it fulfills the individual customer's particular requirements and makes the operator's work easier," Ejvind Jensen explains.

PLC, SCADA system and process control, all on one PC platform

A Beckhoff C5102 19-inch, slide-in Industrial PC controls the machine. This single PC runs TwinCAT PLC automation software for machine control, the plant's SCADA system and the Skakomat 600 process control system.

Data must be imported at various points near the concrete batching plants, e.g. in the filling trench where the trucks unload the sand, at the top of the silo and on the mixing platform where the proportions of the different materials in the mixture are monitored. Communication between the Industrial PC and the I/O takes place via EtherCAT. Furthermore, the PC is connected to the company's administration system and, if necessary, externally to Skako's service department via remote support over Internet.

The advantage of the Industrial PC and the TwinCAT software PLC is, above all, the high processing power. Program parts which are critical in terms of time no longer have to be executed in a fixed task as with a traditional hardware PLC. PC performance enables everything to be executed in the same task, which eliminates the need for special communication between the different program parts.

The global presence of Beckhoff is a great advantage when exporting the machines. "Last but not least, changing to the Beckhoff control platform has made Skako more competitive in terms of price," Ejvind Jensen emphasizes.



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