Compact control solutions for industrial washing machines

Application-oriented selection of a suitable hardware platform and the use of standard programming tools allow powerful and convenient controls to be offered at an optimum price/performance ratio. As a partner to the Bachmann company in Frankfurt/Main, Germany, ECKELMANN AG has developed a particularly low-cost control for an industrial washing machine.

The washing machine developed by Bachmann is a part of a production island for production of plastic intake manifolds manufactured by core casting. This technology involves casting a core made of bismuth and encasing it in plastic. After the bismuth has melted out, what is left is a ready-made plastic part which still, however, needs to be cleaned to remove residue from the melting bath. For this purpose, the parts are removed from the bath with a robot and loaded into the industrial washing machine every 30 seconds.

The washing machine features a turnstile with grippers for picking up four manifolds simultaneously. Cyclic advance of the hydraulically operated turnstile means that one moulded article is always in the loading or unloading position whilst the other three are being cleaned by rotational movement of the grippers in the bath for pre-wash, rough wash and fine wash. Technical functions such as bath filling and emptying and temperature and filling level monitoring of the washing solution tanks, besides additional motion axes, are monitored and controlled automatically.

Compact standard hardware

ECKELMANN AG opted in favour of the C7-624 with integrated operator panel as the control hardware. This compact PLC from the SIMATIC Series offers the entire functionality of a modern controller with low procurement costs. In order to be able to implement all required technological functions of monitoring and control for the application, the internal input and output interfaces of the C7 were extended with external I/O modules from the S7-300.

S7-Graph was used to programming this compact state controller, also using programming modules in statement list format. The flexible and extremely clear method of programming makes it possible to incorporate subsequently integrated technical functionalities of the washing machine easily and safely in the control code even in the commissioning phase.

Time-proven programming tools

The operator interface and the alarm system were elaborated by ECKELMANN conveniently and in application-friendly manner using the COROS ProTool Lite programming tool. All required process parameters such as washing times and monitoring cycles can be configured conveniently using special input masks.

Value-for-money, rugged control solution

The selected hardware on the basis of the Siemens C7 allowed this control application for Messrs. Bachmann to be implemented quickly and at low cost, taking recourse to the above-mentioned, time-proven programming tools. The services performed by ECKELMANN extended from electrical system design, control cubicle construction and software development through to cabling and commissioning in the production island. After successful commissioning, the ECKELMANN team provides support for the installed machines on the premises of the end customer by means of telediagnosis and supplies software updates by modem.