ECKELMANN
Industrieautomation

Compact control solution for industrial washing machines

By application-oriented selection of the suitable hardware platform and the use of standard programming tools, powerful and convenient control systems can be offered with an optimum price/performance ratio. As a partner of the Bachmann firm in Frankfurt/Main, ECKELMANN AG developed a particularly low-cost controller for an industrial washing machine.

The washing machine that Bachmann developed is part of a manufacturing island for the production of plastic intake manifolds that are made by core casting. With this technology, a core of bismuth is cast and is enveloped in plastic. After the bismuth has melted fully, a ready-made plastic part is available which now only has to be cleaned of residues from the molten bath. To this end, robots remove the parts from the bath and load them into the industrial washing machine in a 30-second cycle.

The washing machine features a turnstile with grippers to simultaneously carry four manifolds. By means of cyclic continued movement of the hydraulically driven turnstile, there is one shaped part each in the loading or the unloading position, while the remaining three are cleaned in the basins for pre-washing and for rough and fine washing by rotation of the grippers. Besides additional motion axes, technical functions such as basin filling and emptying and temperature and filling level monitoring of the washing solution tanks are monitored and controlled automatically.

Compact standard hardware
ECKELMANN decided in favour of the C7-624 with integrated operator panel as the control hardware. This compact PLC from the SIMATIC series not only offers low procurement costs, but also the complete functionality of a modern control system. To enable realisation of all necessary technological functions of monitoring and control of the application, the internal input and output interfaces of the C7 were extended by external I/O modules from the S7-300.

For programming of this compact state control system, use was made of S7-Graph, which was supplemented by statement list programming modules. This flexible and distinctly clear mode of programming made it possible, while even still in the commissioning phase, to easily integrate later incorporated technical functionality into the control code without risk.

Proven programming tools
Using the COROS ProTool Lite programming tool, ECKELMANN set up the user-friendly and convenient user interface and message system. All necessary process parameters such as washing times and monitoring cycles can be configured conveniently via special input screens.

Low-cost and robust control solution

With recourse to the aforementioned proven programming tools, the chosen hardware based on the C7 enabled swift and low-cost realisation of this control application for Bachmann. The services provided by ECKELMANN ranged from electrical system design, control cabinet construction and software development to cabling and commissioning in the production island. Following successful commissioning, the ECKELMANN team takes care of the machines installed at the customer's by remote diagnosis and supplies software updates via a modem connection.