



Made-to-measure plant monitoring via Ethernet

Considering the rapid development in the high-tech electronics sector, worldwide demand for printed circuit boards is continually growing and has created an enormous market. The manufacturers of printed circuit boards include Hsiangkuo Computer Co. Ltd, which has various production sites in China. The company sells its products to well-known manufacturers of computers and electronic appliances in America, Europe and South-East Asia, among others. Plant monitoring at the individual factories is based on Beckhoff components.

In 2007, Hsiangkuo Computer decided to introduce a monitoring system to record and remotely retrieve the current operating status of its production equipment. After thoroughly testing various control solutions and comparing them with one another, Beckhoff was chosen as supplier.

The plant monitoring system is based on the Beckhoff Bus Terminal I/O system. The differing degrees of automation in the individual manufacturing facilities at the factory in Suzhou represented a particular technical challenge: besides semi-automatic and fully-automatic machines, manually operated machines also had to be integrated in the plant monitoring concept.

In the first phase, essentially only semi-automatic or manually operated equipment was integrated in the monitoring concept. At the same time a large number of machines were in use that work independently from one another and whose location is not permanently fixed. Bus Couplers and I/O terminals form the starting basis of the plant monitoring system. If the machine is relocated, as occurs occasionally, only the cabling needs to be changed.

Almost exclusively, fully-automatic machines, which are part of a production line and feature PLC controllers from different manufacturers, were integrated in the second phase. Hsiangkuo chose Modbus RTU as the fieldbus. For this purpose, BX series Ethernet Bus Terminal Controllers were used, which transmit the data to the PC via the communication interface.

All real-time signals from more than 400 machines in the factory are input via Ethernet to the central Beckhoff C6140 Industrial PC. The recorded signals are converted via TwinCAT PLC into the data required to monitor the plant status. By means of connection to a database, status protocols relating to a year, a quarter, a week or a day can be created. The decisive advantage is that the plant status can be viewed from anywhere via an Ethernet connection.