OPC UA Ensures High Delivery Reliability from Injection Moulding Manufacturer

The injection moulding machines from ARBURG are optionally supplied with an integrated embedded OPC UA server developed on the basis of Softing's OPC UA Toolkit. The benefits for ARBURG's customers: reduced installation and commissioning effort and simplified integration of the machines into higher-level applications.

The first small step

The development of any large company starts with a first small step. In the early 1950's, the family company founded in 1923 had nothing at all to do with the manufacture of plastic injection moulding machines. At that time, ARBURG produced camera flash units, with considerable success worldwide at first. Then, however, a problem arose: The flash units were not working properly due to leakage currents. To solve the problem, the connectors were to be overmoulded in plastic, but it turned out that there was no suitable machine for this purpose. Undeterred, ARBURG decided to design and build their own machine – a small step, an initial idea that has been consistently pursued and has led to ARBURG's development into a world-leading manufacturer of high-quality injection moulding machines.

Every day, millions of people use articles made of injection-moulded materials like plastics, metals and ceramics. Products manufactured using ARBURG technology are in use today in a vast variety of different industries and areas of life: for example, in telecommunications (mobile phone skins), medical technology (cannulae and sterile containers), the automotive industry (trims and switches, airbags), in packaging technology (closures), in offices and households, and for leisure activities (bicycle helmets).

ARBURG offers its customers individual and industry-specific injection moulding solutions and in-depth knowledge from a single source – from injection moulding machines and robot systems to turnkey solutions and production optimization.
The product portfolio features a wide range of modular injection moulding machines, including hydraulic, hybrid, electric and even vertical machines, which can be customized to suit the customer's specific needs – from basic to high-end machines. The ARBURG robot systems, comprising linear robot systems, pickers and six-axis robots, are integrated into the central SELOGICA machine control and are production-ready with very little setup time and effort.

High delivery reliability through continuously available key data

The associated ARBURG host computer system allows planning and controlling the entire production process, resulting in a high product quality and reduced downtime. All injection moulding machines and production systems regardless of the manufacturer, year of manufacture or production process can be integrated into the powerful system. Customers can centrally manage product, tool and material master data, as well as capture data online regarding order progress, machine status, process parameters and alarms. They can also determine key data on orders in progress, production shifts and production quality at any time. All this runs silently in the background via an OPC UA connection between the host computer system and the machine, as this information is not relevant to users. For them, it is important to have reliable data enabling them to use the existing capacities to the full, and thus achieve high delivery reliability.

Success through innovative standards

Through continuous innovative development, ARBURG has consistently shaped the future in "injection moulding" technology. The overmoulding of inserts, multi-component injection moulding, the principle of swivelling clamping unit and interchangeable injection unit, the horizontally movable injection unit – just a few examples of the major developments with which ARBURG has advanced injection moulding technology worldwide. Thus, it is not surprising that ARBURG is also at the cutting edge in industrial data communication via OPC. When, in 2009, ARBURG was looking for the best solution to connect the host computer system to the injection moulding machines, the decision was made in favor of OPC UA: "We needed a widely accepted international standard, which we found in the OPC Unified Architecture," explains Michael Vieth, Group Leader TA Control Technology.

Fig. 1: Gear knobs are produced on ARBURG injection moulding machines (photo: Arburg)

Platform independence through OPC UA

Although ARBURG has an unusually high in-house production level of around 60% – even the entire SELOGICA control for the injection moulding machines (hardware and software) is manufactured in-house – there was little discussion about the purchase of an OPC UA toolkit. "We quickly agreed to focus on our core competency in control technology rather than on programming the low-level OPC UA layers. In addition, we had a deadline to keep, which could only be met by using an OPC toolkit that supported the use of Wind River's VxWorks real-time operating system," adds Michael Vieth.

The embedded OPC UA server developed with Softing's OPC UA VxWorks Server Toolkit runs under VxWorks on the visualization CPU of the SELOGICA control. It allows communication with the outside world, both with an ARBURG host computer system and with third-party systems. The fact that the OPC UA client developed for use in the ARBURG host computer system runs in a Java environment shows the platform independence of the OPC UA standard. And just as customers can connect their own host computer systems to the ARBURG injection moulding machines via OPC UA, the ARBURG host computer system can access third-party injection moulding machines via OPC UA.

"Even though we were apparently among the first to use Softing's OPC UA VxWorks Server Toolkit, the OPC UA server development went smoothly with no problems. Any questions we had were answered quickly and accurately by the customer support, if necessary in consultation with the development department," says Armin Ruoff, the software developer in charge.

More time for value-adding activities

The ARBURG host computer system is a powerful modular production management system. Field-tested and proven, it offers the required functionality for modern, reliable and cost-efficient production. A flexible and rapid response to changing requirements is the order of the day. The central online data acquisition and processing of machine and order data on the basis of the OPC UA standard provides the necessary transparency in production and ensures competitive advantages for the customers. Relieved of the task of manually capturing their operational and machine data, customers have more time for other value-adding activities such as production planning and organization.

Author:
Peter Seeberg, Market Segment Manager Factory Automation, Softing Industrial Automation GmbH

http://industrial.softing.com

German article published in:
it+production, ed. 11-2012
elektrotechnik, ed. 4-2013