Compact intelligence: The BL20 I/O System ensures not only signal distribution, but also houses the CoDeSys control software

# It's All in the Coating

## Programmable gateway in BL20 I/O system guarantees down-to-the-degree coating temperature control in printing machines

Whether matt black, glossy color or metallic glitter, perfect coatings on magazines, brochures or packaging is not just a matter of individual taste. They attract attention to the magazine on the shelf and give the publication a certain air of authority. The greatest challenge in working with such coatings – mostly UV or dispersion coatings – are the varying processing temperatures with which the coating has to be applied to the print material. Due to the large-volume coating containers used in the industry, the contents can only be slowly brought up to the target temperature, which is a time consuming process. In addition, the coating cools down again as it travels the often long routes between the coating container and the processing. This means that in the end it can no longer be processed in the optimal temperature range.

**In a small space in the control cabinet, the Bricort system combines a touch panel with a flow path temperature control device in which the coating is heated up or cooled down**

With the newly developed Bricort mobile coating temperature control device from Industrie-Automation Vertriebs-GmbH (IAV), based in Rodgau, Germany, these problems are now a thing of the past. The starting point for the development o f this product were repeated attempts by print machine manufacturers to build a device that offered considerable benefits compared to the relatively imprecise and energy-intensive method of preparing coatings, explains Guenter Jung, the technical manager of IAV. "We found that there existed among print machine manufacturers a certain pent-up demand with regard to coating temperature control. This is a gap that we have now been able to close with our Bricort system."

Together with the Institut für Druckmaschinen und Druckverfahren (IDD) [Institute for Print Machines and Print Processes] of the Technical University of Darmstadt, automation and engineering specialists spent three years developing a compact temperature control device that can be easily integrated into existing coating systems. The kicker: The system called Bricort measures the temperature of the coating to be processed very close to the finishing location, directly on the so-called "anilox rollers" from which the coating is transferred to the printing substrate via a roller system.

**Innovation:**
**The coating temperature is recorded using the PT100 directly on the anilox roller (trade show model shown here)**

For this purpose, a PT100 temperature system is mounted in the connection nozzle to the anilox roller which continuously reports the output temperature to the controller. This system ensures that there are no temperature fluctuations because of supply piping that is too long. "With the help of Bricort, for the first time coating technicians are now able to maintain narrow temperature tolerances of only ±0.5 °C and adjust the temperature as well as the associated viscosity of the coating," explains Jann Neumann, a research scientist at IDD and responsible for the development of the control system.

## "Positively surprised"

In a small space in the control cabinet, the Bricort system consists of an "on-top" multi-lingual, built-in touch panel for entering the desired processing temperature, as well as a flow path temperature control device in which the coating is heated up quickly or cooled down by switching on a cooling device. "This design has a a cooling efficiency of only one kilowatt, which is completely sufficient." This represents an incredible energy saving compared to conventional devices with a cooling efficiency of 3 kilowatts and more," says Guenter Jung.

Due to its compact and modular design and the option to integrate additional electronics modules in the system in any sequence, the Turck BL20 remote I/O station quickly turned out to be the ideal solution for developers. "We had mainly been looking for hardware that was compact and could be programmed with CoDeSys," describes controller specialist Stefan Globig. "In addition, we wanted to protect the programming know-how that was used to create a control system that can maintain the temperature precisely within a range of only 1 °C. The compact controller in the BL20 gateway perfectly protects the CoDeSys program from unauthorized access."

Neumann and Young developed the system's prototypes using control components from National Instruments. "Though the NI components are powerful, they are also too large and expensive for use in mass production," explains IAV technology head Jung, who hired the engineering company of Stefan Globig to handle the electronics and controller design. "The Turck controller in the BL20 gateway is not only very compact, but also ideal for use in mass production in terms of the cost/benefit ratio," explains Jung. "You also can't forget that Turck provided the development software with a large range of finished functional components license-free which enabled us to write the first programming lines within just a few minutes," adds Stefan Globig. "I was positively surprised how well and how quickly the integration of the display from a third party manufacturer functioned in the system."

## Heart of the system

In the IAV temperature control device, the BL20 remote I/O station combines sensors and actuators with the gateway's own controller. Thanks to the TCP modbus protocol, the temperature control device is also directly connected to the control unit in the print machine so that the print and coating process can be controlled using one unit. "Together with the touch panel, the BL20 station functions as the heart of the machine," summarizes Globig.

But the development of Bricort is not the end of the IAV developers' work on fluid automation in coating machines: "We are already thinking about creating an integrated solution that can combine in one machine all components such as coating preparation, coating supply and the associated piping components and parts," explains Jung.

"The Turck controller in the BL20 gateway is not only very compact, but also ideal for serial use in terms of the cost/benefit ratio."
**Guenter Jung, IAV**

### Quick read

With its compact coating temperature control device Bricort the German company Industrie-Automation Vertriebs-GmbH (IAV) has developed an energy-efficient and cost effective solution for maintaining and controlling the exact temperature of printing coatings. The system's core is the modular BL20 I/O system from Turck.

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