EXISTING PRODUCTION EQUIPMENT **RETROFITTED WITH MICA®**

Centralized machine monitoring and process optimization are two of the fastest ways to operate production systems and machines more efficiently and cost-effectively. Still, with machinery lifetimes of between 15 and 30 years, a large part of the existing machine stock usually possesses neither the computing power nor the memory capacity to capture, store, or communicate relevant data. In many cases, these machines also use data for-mats and protocols from the 1980s and 1990s – meaning they've long since stopped being supported by PLCs and industrial PCs.

A retrofit example can be found in an injection molding machine used in HARTING's connector manufacturing line which communicates via the EUROMAP 15 protocol. The protocol is no longer state-of-the-art. Visualization in the MES system is neither economically viable nor desirable in terms of operational safety. Here, the MICA® bridges the gap between the injection molding machine and the ERP/MES by implementing the RAMI 4.0 management shell. Next is the deployment of the EUROMAP 15 interface, which while it is present in the machine has nevertheless not been used due to the lack of a suitable communication partner.

EUROMAP 15 is a rather simple protocol that specifies the exchange of information between a machine and a host computer. Various telegrams are defined to achieve this, such as the interrogation of the production status or the transmission of settings data, etc., which are exchanged as coded byte sequences. The specification of the protocol comprises a total of eight documents, among others the elementary communication protocol,

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the monitoring and control of production, the transfer of data records or the transfer of variables. The MICA® implements the entire protocol and performs the encoding and decoding of the telegrams. The machine's telegrams received as byte sequences are transformed into natural-language JSON objects and thus made available for modern communication systems such as MQTT or OPC UA. In the other direction, the MICA® handles the conversion back to byte sequences and communicates with the machine in accordance with the protocol.

Thanks to the modular open-source design of the MICA®, existing MICA® containers and open source code were able to be accessed and development time was substantially reduced. The modularity and the use of an intermediate JSON format also makes it possible to integrate other legacy systems with minimal effort. On the server side, the approach also offers extreme flexibility and connectivity: other protocols and data sinks can be supported by incorporating an appropriate container such as e.g. the Cloud connectors for IBM Bluemix, SAP Hana, Microsoft Azure or Amazon Web Services. ■

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EUROMAP 15

In 1992 the EUROMAP Association published the EUROMAP 15 protocol for the communication of injection molding machines and host computers. It enables the exchange of production and settings data as well as status and statistical information, and defines the telegrams to be used for this purpose. Originally designed for use on the basis of serial interfaces (RS 485), Ethernet connections are now also supported

IN BRIEF

- Read operating parameters online
- Loading production plans to the machine and from the machine online
- Continuous capture and storage of all data, which are then available for various uses