



(Bild: Sontheim Industrie Elektronik)

Retrofit has proven itself as the first step towards digital transformation

# Out of the IoT jungle

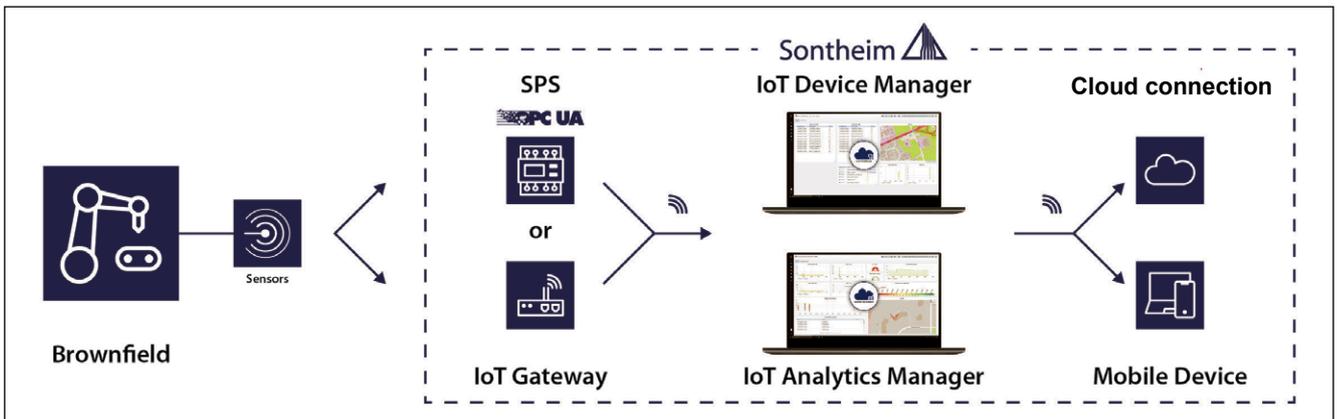
In order to ensure to ensure a flexible intelligent automation systems and to become industry 4.0 ready companies can upgrade to a wide range of connectivity solutions by retrofitting – without high investments or a redesign of the plants.

By Lena Kappel

Those who want to stay on course in the future must keep pace with the digital transformation. A large number of providers are advertising the transformation to smart factories that organize themselves and act autonomously in real time. More and more buzzwords around the topic of digitalization as well as complexity of automation solutions and greater interdependence within system automation however, are making it

more difficult for OEMs the "digitalization perspective". Especially for smaller machine manufacturers and medium-sized companies, the digital transformation is often a monumental task. They often do not have the resources as large corporations or have invested in their plants not too long ago, without them being IoT-ready. Now they are skeptical about such changes, because a loss of investment can have fatal consequences. In addition time and possible downtimes have to be taken in account.

Retrofitting can be considered so that a complete machine park does not have to be planned and replaced again at great expense. The term retrofit stands for the retrofitting of existing equipment, the so-called brownfield. A step-by-step approach becomes possible and quantifiable, so that the investment expenditure can be spread over several years. The brownfield meets basic requirements such as safety standards and regulatory norms.



Procedures for the IoT retrofit of existing plants – with system solutions from Sontheim Industrie Elektronik GmbH

Retrofitting makes existing machines fit for digitization, and the first step toward greater flexibility and networking of the systems has been taken - much more quickly than with new construction. And the prospect of faster production processes that can be adapted at short notice, enabling smaller series and greater customer satisfaction, will increase the popularity of machine manufacturers. An IoT gateway serves as a means to the end of the retrofit.

### Tasks of a IoT gateway

Existing plants can easily be supplemented with a gateway solution. A connection to the machine can be established via fieldbus communication in order to read out the machine's sensor data. A further connection to higher-level systems, such as cloud-based platforms or ERP systems, enables the evaluation of the data. The gateway thus makes continuous process monitoring and thus control of potential sources of error possible. In addition, a direct diagnostic function can also be available for debugging and prevention.

In order to exploit the full potential of machine data for effective and efficient use, the data must be transparent and continuously available. With the relevant and processed data collected, reliable and meaningful assessments and thus improvements can be planned and made in the next step. This in turn optimizes processes or costs and helps to avoid maintenance work or shorten downtimes.

The combination of IoT gateway and cloud tools is a practical solution. The IoT gateway collects the recorded data securely and easily at the machine. A secure cloud ensures the provision and availability of the data. Customer-specific requirements and platform-independent standards must be taken into account

- both are becoming increasingly essential in the age of IoT and Industry 4.0. Interoperability is required to make different manufacturer solutions easily compatible and to make plant systems as user-friendly as possible. This requires open communication standards and architectures. Another way is to modernize the control unit: The memory-programmable control system is replaced by a new, more powerful version equipped with the necessary interfaces. With the new hardware, performance and efficiency can be increased and the potential for errors and downtimes reduced.

Various vendor-neutral communication technologies can serve as the platform for smart plants. Among the most widely used are the MQTT (Message Queuing Telemetry Transport) and OPC UA (Open Platform Communications - Unified Architecture) standards. Customized applications that require the integration of WLAN, OPC UA or MQTT are already being successfully implemented. OPC UA as a platform-independent architecture fulfills the main prerequisite for the necessary interoperability in the IIoT: the semantic description of the information. It ensures continuous communication between the field devices and from them to the cloud - in other words, vertical and horizontal communication. This is how the connection between OT and IT can be established.

The OPC UA architecture also includes so-called companion specifications. OPC UA allows device and function descriptions to be created as information models, whereby industry-specific models can be standardized and are then Companion Specifications. The Companion Specifications thus define the form in which machines provide data. They include, for example, specifications for programmable logic controllers, CNC systems or analysis devices. In this way, new machines can be quickly

and integrate it into an existing plant, because the programmers of a control system no longer have to deal with its specific properties, but can rely on the functionality as stored in the Companion Specifications

### Retrofit - uncomplicated start into the digital world

By taking a holistic approach with modular software and hardware solutions, customers can be offered an all-round IoT package - including IoT gateway and cloud solutions - from the individual concept to the integration of the systems. In (retrofit) solutions, such as an IoT gateway, integrated diagnostic functions can enable autonomous debugging. In addition, the management, analysis and visualization of live data from the field is an important element in making factories smart. Extensive evaluations and continuous monitoring, even in real time, can increase yields, lower costs and reduce errors. Such applications have differentiation potential in industry and for off-the-highway applications. Of course, it is important for the customer to weigh up what lifetime can still be expected for existing plants and how quickly the investment made will pay for itself. Depending on the plant structure and characteristics, different approaches to modernization may make sense. Either way, both variants hold a lot of potential and should be considered as options in investment planning. As a system provider, Sontheim Industrie Elektronik supports users as a partner with the right all-round package.



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