Sendix EtherNet / IP encoders with OPC UA interface.

all pictures: Kübler

Does the sensor have to go into the cloud?

Intelligent sensor networks form the backbone of the IIot. Focus is set on networking at all levels. Kübler is convinced that encoders will play a key role and illustrates already today how theory turns into practice. Basing on the Sendix EtherNet / IP encoder with OPC UA interface, Kübler presents a possible concept, which realizes the integration and therefore the information exchange in the IIoT environment.

Keywords: Sensor networks, encoders, IIot

Important insights are asserting themselves for the implementation of the IIoT for a self-organizing production. On the one hand, the companies are depending on the provision by the sensors and components manufacturers of corresponding data, which exceed classical process data. For example, an encoder must not only provide speed and position, it must also be able to communicate its identity, its configuration, whether it detects errors and its environmental conditions (e. g. operating temperature). On the other hand, it is hardly possible to switch a complete production to IIoT in one single step. Therefore, a long-term planning with a defined and coordinated approach is crucial. The sensors manufacturer Kübler used theses insights to put its product development / evolution on the right track.

Today's solutions are the foundation of tomorrow

What does "IIoT-ready" mean for an encoder in the context of a long-term and progressive implementation? From a technical point of view, it is possible already today to equip sensors with a web server or with the OPC UA interface, which Kübler already realized in its new Industrial Ethernet encoders generation. But, considering the current practical requirements, this kind of implementation is rather exceptional. It is also a question of costs. The fact that sensors of any kind require more and more software to realize numerous and useful functionalities is undisputed – keyword is Smart Sensors. Experience also shows that software is developing in a faster and more dynamic way than in the past. Basically, a developer should, whenever possible, prefer a sensor including a field bus interface or, better still, an Industrial Ethernet interface. By now, this is no longer an important cost issue, as for example CANopen encoders are at a cost level similar to that of standard SSI encoders. When selecting the encoder, it must be checked whether it is able to provide also further data, for example data required for predictive maintenance concepts, and thus make sure the plant remains future-proof. This allows laying an important cornerstone for the progressive implementation of the IIoT. There is no doubt, that we do not need today everything that has been planned for the IIoT. This is why it is particularly important that the sensors already mounted in the course of the implementation or in the period leading to the smart factory can receive software updates. If not, this would lead to consequences such as high new procurement costs and dismounting and re-mounting costs for new sensors.

Based on this knowledge, Kübler implemented a boot loader function in its Sendix encoders. This allows loading software updates easily via the customer interface and realizing new functions.

Encoders provide decisive information

Kübler's Sendix encoders provide, besides the classical information such as position and speed, also further information such as, for example, the internal temperature monitoring, thanks to an integrated diagnostic function. Already today the BiSS protocol allows implementing an electronic data sheet that does not simply identify the encoder, but also provides for example the corresponding data of the coupled electrical motor.

The platform of the latest encoder generation plans on the one hand the possibility to connect further sensors and to transmit prepared and packed data to the control, for example via the single-cable interface, which substantially reduces wiring work. On the other hand, it plans also to store further data relevant for comprehensive diagnostic concepts, such as for example condition monitoring.

OPC UA interface – pathbreaking for the future

Whoever has progressed in his implementation of the IIoT to such an extent that he considers direct, automation control-independent communication to a cloud solution or to another higher-level system, will find with the Sendix Industrial Ethernet encoder with integrated OPC UA interface the right, future-oriented solution; in particular for cross-system communication (from machine to machine and from machine to the cloud). This interface has moreover the distinctive feature of transporting and semantically describing machine data. It does not simply allow remote diagnosis thanks to a simple communication with cloud solutions, it also allows configuring the encoder via the Internet and therefore eliminating quickly and efficiently errors in the event of a failure. All Kübler Industrial Ethernet encoders with the Profinet, EtherCAT or EtherNet / IP interface offer the possibility to integrate the OPC UA interface. Both protocols are then provided via the same encoder connection. Condition monitoring data such as the temperature, error messages, operating times, voltage supply, can thus be transmitted directly into the cloud. This allows simpler and faster realization of predictive maintenance approaches in new SCADA concepts.

Important

Sensors selection is and remains a decisive factor if the goal set is the IIoT vision of the future. Sensors equipped with smart interfaces and able to provide an electronic data sheet are predestined for this application. They should in addition offer the possibility to be constantly adapted with software updates in the course of the implementation of the IIoT.

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Kübler, www.kuebler.com/industrie-4.0

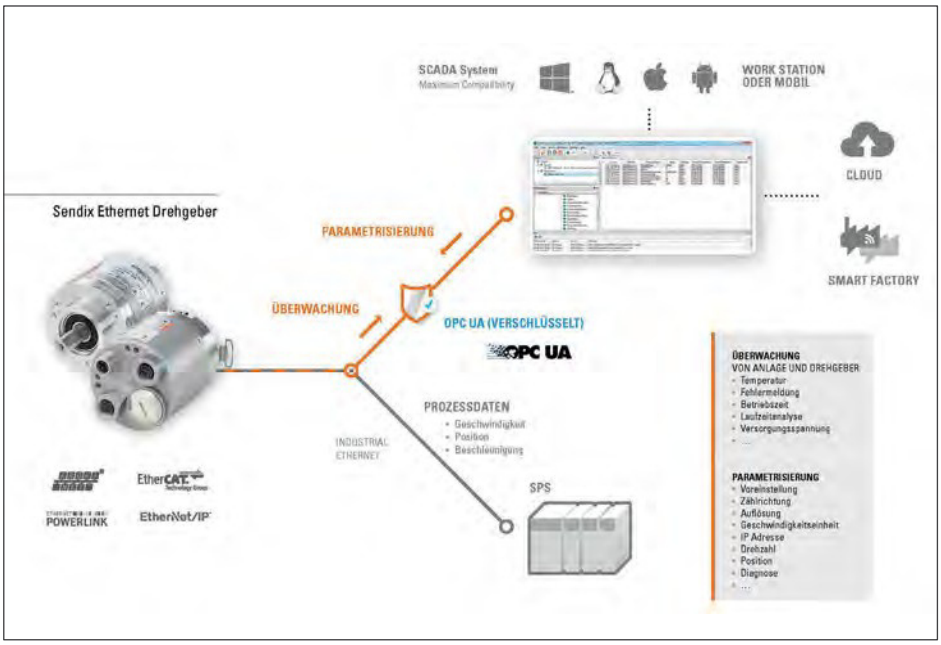

Illustration of a possible integration. Sendix encoders with OPC UA interface transmit process data, data for condition monitoring and parameterization data.