Kübler

NEW

KÜBLER

INDUSTRY 4.0 / IIoT

pulses for automation

Kübler products for Industry 4.0 / IIoT

The implementation of Industry 4.0 / IIoT concepts in practice is one of the central challenges for every development engineer. The definition of individual concepts is the first step.

In concrete terms, this means: which of the possibilities offered by IIoT should be used? In addition to a wide range of "Industry 4.0 / IIoT ready" components, Kübler also offers support during implementation.

Learn more >

Industry 4.0 / IIoT ready

Networked and intelligent products are a prerequisite for Industry 4.0 / IIoT. They are able to say:
"Who am I? Where am I? How do I feel?"

"Industry 4.0 / IIoT ready" means: In addition to their classic tasks such as measurement or transmission, all components used must also provide further functionalities for networking the products and for collecting or transmitting additional information.

Connectivity

Connectivity stands for the ability to communicate additional information and / or to be integrated in a network. This can take the form of additional interfaces such as OPC-UA (e.g. for additional edge communication) or Industrial Ethernet communication as well as a digital interface such as "BiSS".

Identification

Identification is the ability to transmit technical information by means of an electronic data sheet / nameplate. In addition, further information about the machine can be transmitted (e.g. information about the axis where the encoder is installed). Essentially, all the information required in the application for asset management is recorded here.

Diagnostics

Diagnostics functions provide relevant information about the condition of the product (e.g. error messages) or indirect information about the application. For example, an integrated temperature sensor can indicate that the permissible working temperature range has been exceeded. Or integrated vibration sensors provide information on the condition of the power train bearings. Highly integrated bearingless systems in particular can provide reliable information here. Log and time stamp functions in Industrial Ethernet encoders make it possible to create lifetime histograms.

Adaptability

Adaptability refers to adaptability, which can take place on two levels:

- At the operational level, the parameters / settings of an encoder can be changed during operation, e.g. to optimize setup processes or to eliminate measurement errors with digital signal processing.
- Software updates can be carried out at system level at any time.

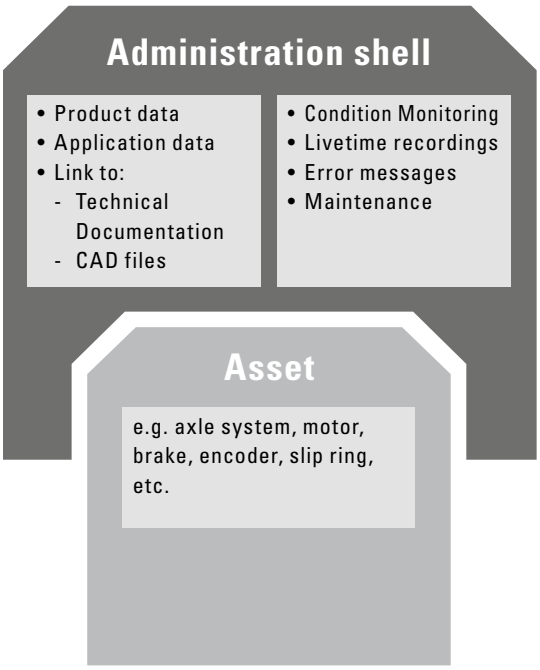
The range of functions for the implementation of Industry 4.0 / IIoT concepts can be subsequently extended in order to guarantee the future viability of the system. Therefore, all Kübler fieldbus and Industrial Ethernet encoders are available with a firmware update function as standard.

IO-Link PROFINET EtherCAT Technology Group EtherNet/IP ETHERNET POWERLINK MQTT OPC UA TSN

Asset-Management

Which Industry 4.0 / IIoT functionalities an asset needs to be "Industry 4.0 / IIoT ready" depends on the overall concept. The decisive factor here is the role assigned to the asset. Either as a part of or as an independent Industry 4.0 / IIoT object.
This determines whether the asset must have its own administration shell or be integrated into an existing administration shell.

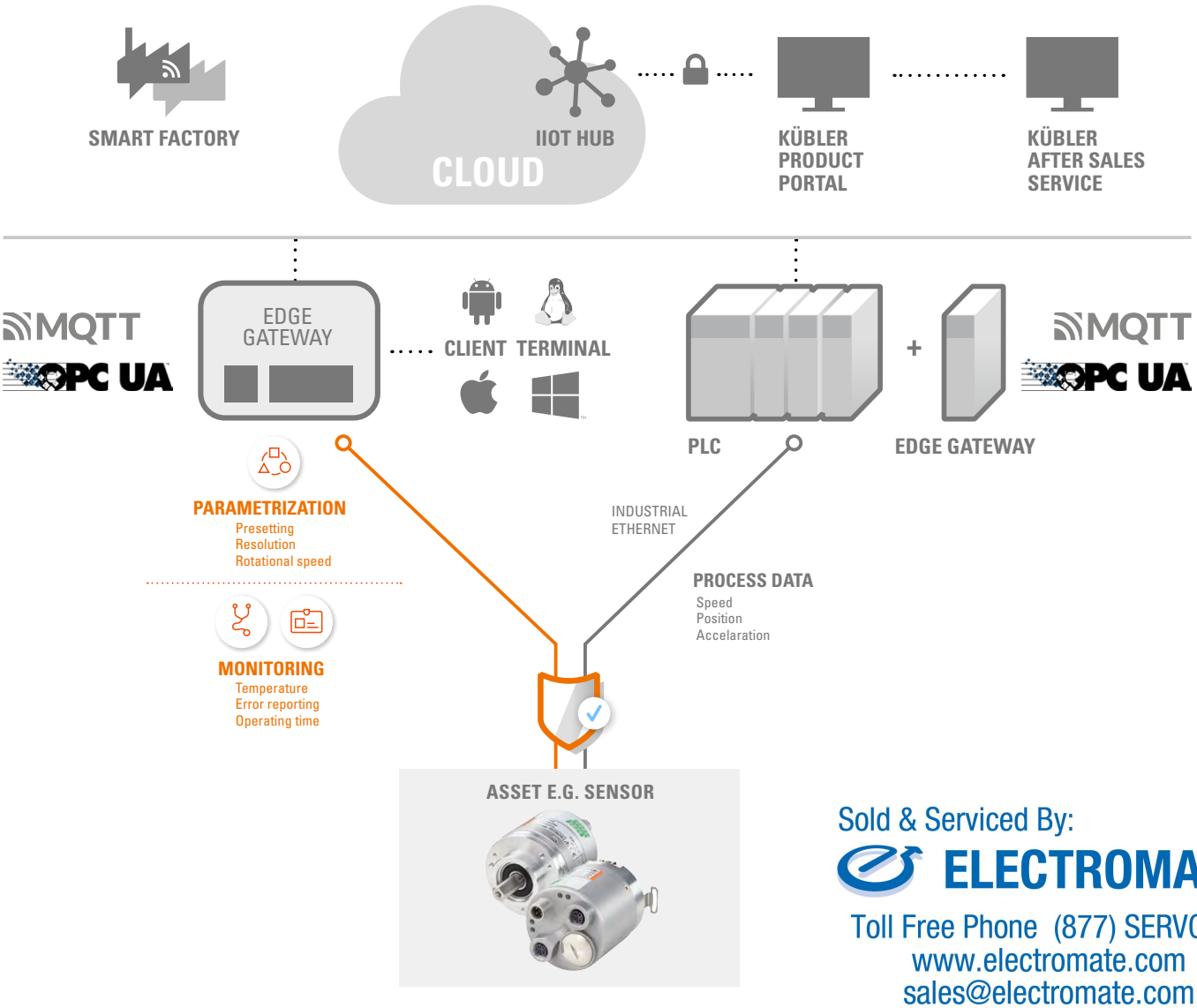
An asset with its own administration shell not only has functions on the "field level", but also on the "control level" or up to direct "edge communication".
In most cases, however, the asset is integrated within an object, such as a power train. In this case, the question arises as to which of the elements in the object should be the administration shell and also takes over the administrative functions.
An asset can fulfill this role (completely or partially), as the electronic data sheet contains not only the information about the asset itself but also about the entire power train.
In principle, the administration shell represents the virtual representation of the product (digital twin) and the technical functions. This makes a large number of use cases possible, from simulation to asset management.



Use Cases

Industrial Internet of Things opens up new perspectives and new business ideas. Compared to the current automation world, which is mainly device-oriented, Industry 4.0 / IIoT offers a complete system view.

In addition, the technology enables manufacturer-independent access to device data, additional standardized services and simplified device administration. The implementation should take place step by step and be based on practical applications or implementations (use cases).
Therefore, we recommend defining the individual use cases first and then planning the technical implementation.



Digital nameplate

Today's physical nameplate, which forms a legal binding for the identification of a device without any further aid, is included on almost every product with all relevant information. With digitization, the purely analog nameplate belongs to the past. Complexity and variant diversity can be eliminated by outsourcing a lot of information.

With the help of a digital identifier such as a QR code or RFID tag, a digital nameplate can be implemented that provides the device information in electronic form.
Via a smart device such as a smartphone or tablet, the user receives the connection to the digital nameplate. According to the new international standard of IEC 61406 (with QR code), the digital nameplate is described. Beyond the identification of the asset, the digital nameplate forms the basis for the digital twin.

BENEFITS AT A GLANCE

- Unlimited space of information
- Fast access to information
- Reduces time and costs
- Sustainability
- Clear and dynamic information
- Global transparency

The digital nameplate is the basis for many other use cases of the digital twin.

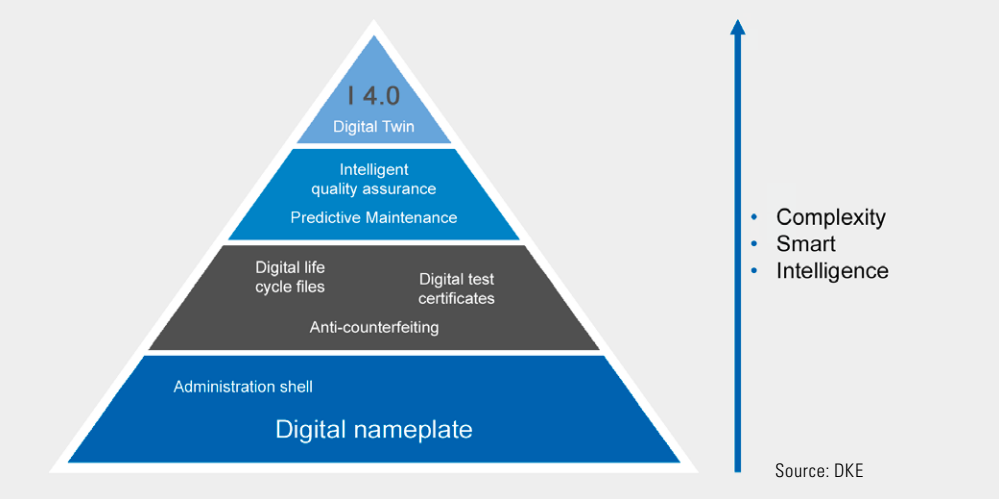
- Sustainability (paves the way for "paperless documentation")
- Key for further product services such as "Predictive Maintenance"
- Mapping of characteristic values such as "CO2 footprint" or "MTTF failure probabilities"

Scan QR code and get to the digital nameplate.

Digital twin

The digital twin digitally mirrors a physical product, making it easier to realize various new possibilities. The digital twin forms the upper level in complexity, smartness and intelligence with regard to Industry 4.0.

The basis for this is the asset administration shell (AAS), which reflects the corresponding product.
AAS contains various submodels such as asset identification, documentation, certification and quality information, and much more.
Depending on the complexity of the asset, simple use cases can also be realized with just a few submodels.



Use Cases

Asset Compatibilität
- Asset Onboarding
- Interoperabilität of components, manufacturer-independent
- Digital nameplate

Engineering
- Concept and design of new machines / products
- Virtual commissioning / remote commissioning support
- Process simulation

Smart Manufacturing
- Asset Management / Machine Book
- Update/Upgrade in field
- (Big) Process Data Management
- Live Monitoring
- Predictive maintenance

Sustainability
- Product Carbon Footprint (PCF)
- Energy Monitoring / Energy Saving Mode

Circular economy
- Material compliance
- Material decleration
- Reduced waste

The selection process for components is simplified and the purchasing process streamlined. This can ultimately also strengthen the competitiveness of the individual companies.

OPEN INDUSTRY 4.0 ALLIANCE | IDTA | VDMA | bitkom | PLATTFORM INDUSTRIE 4.0 | ZVEI | DKE

KÜBLER WORLDWIDE

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