SmartFactory KL
New infrastructure

Puts TSN to the test and facilitates AI applications

smartFactory KL®

Infrastructure for Industrial Intelligence applications

The new infrastructure concept at ***SmartFactory***[KL] represents a scalable solution that is appropriate for Industrial Intelligence applications. In addition, the use of TSN for the data exchange between infrastructure and server ensures transmission quality.

Infrastructure concept at SmartFactory^{KL}

› *Use Case: Infrastructure nodes and Edge Computing*

- The ***SmartFactory***^{KL} partner consortium has given the infrastructure of the Industrie 4.0 production plant a new, star shaped, scalable installation concept. The infrastructure nodes support independent production cells having several stations. The computing power provided by edge devices in these nodes is now available for Industrial Intelligence applications.

- A good example of the benefit of locating edge computing in the infrastructure box is the display of usage data for the individual stations shown directly on the box. The production worker can quickly see and associate the data with the connected modules. This simplifies decentralized condition monitoring and enables anomaly detection in the production station and analysis using the power data, which then facilitates the initiation of the required maintenance steps.

> ***"This solution illustrates the next step towards the practical introduction of a standardized module interface. The production plant can now be quickly and flexibly reconfigured."***
>
> Prof. Dr. Martin Ruskowski,
> Department Head of Innovative Factory Systems research at **DFKI**

Companies participating in the infrastructure working group at ***SmartFactory***^{KL} are B&R Automation, Bosch Rexroth, HARTING, Huawei, PHOENIX CONTACT and Weidmüller.

› *Use Case: Real time TSN technology*

- ***SmartFactory***^{KL} has recently implemented data transmissions between infrastructure and server via real time TSN technology (Time-Sensitive Networking). Data packets are now prioritized using TSN. Thanks to priority classifications, flexible decision-making is possible about what data must be immediately available and where delays are acceptable.

- TSN guarantees, for example, that critical safety data will be sent with the highest priority and will arrive even when the network is heavily loaded. It ensures that even in an overloaded network, the station continues reliable operation.

> ***"TSN makes an important contribution to both horizontal and vertical integration. Additionally, TSN in combination with OPC UA facilitates manufacturer independence at the data transmission level. This means multiple sensors and actuators can send and receive data in real time while ensuring that existing plants can be flexibly upgraded. The proprietary field bus of the past is no longer an issue."***
>
> Prof. Dr. Detlef Zühlke, Chairman of the Board of ***SmartFactory***^{KL}

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