RetroNet

RETRONET –
PRACTICAL BRIDGE TO INDUSTRIE 4.0

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Smart factories in which all production resources are largely networked represent the unique feature that sets Industrie 4.0 apart. These factory networks deliver up-to-the-minute data from production and operations and allow it to be archived. Business analyses, forecasts and decisions all benefit from this base of comprehensive information. The RetroNet collaborative research project is aiming to make it possible to link existing production resources and so bring »research to the shop floor«.

RetroNet to help jump start the fourth industrial revolution

The fact that Industrie 4.0 is increasingly finding its way into production means that factories are facing ever-changing circumstances. Machine inventories, particularly the ones at small and medium-sized enterprises (SMEs), represent long-term investments in monolithic systems – investments that will delay the practical deployment of Industrie 4.0 technologies and that will furthermore slow down application-oriented development.

The RetroNet project intends to deliver methods and components that will allow existing hardware to be integrated into the controls of smart factories. To this end, physical and logical connectors are being developed that will make it possible to connect existing machines and equipment to control platforms. Companies will in this way be able to gradually build up cyber-physical systems and combine classical production with Industrie 4.0 as their requirements demand. The RetroNet project therefore may be regarded as constituting a bridge between currently existing machine stocks and networking that is based on the Industrie 4.0 model.

(VALUE-ADDED) SERVICES

HMI — Capacity Utilization — Energy Monitoring — ...

INDUSTRIE 4.0 – PLATFORM

C = CONNECTOR

How the project operates

The project's starting point is the industry partners' specific application scenarios. An assessment is made in regard to which machines and equipment need to be linked to control platforms and which example services would consequently be relevant to them. The range of scenarios here includes both the methodically accompanied integration of individual machines in small companies and the integration processes for series production lines. Fundamental to these tasks is the mapping of machine, plant, and production data that would need to be transferred to a central data-management system.

Under the auspices of Bosch Rexroth AG, »connectors« are being developed as adapters that deliver the envisaged range of functions. The development of the corresponding software platform is being coordinated by PI Informatik GmbH while, in parallel, methods and concepts are being created that will allow the added value, investment and risk for the companies engaged in the Industrie 4.0 integration processes to be analyzed. RetroNet is in this way developing a structure of methods that will accompany businesses from selection and cost estimation through the process of integration to the deployment of suitable value-added services.

Fraunhofer IPK's contribution

The Process Automation and Robotics department at Fraunhofer IPK has been tasked with developing the communication software that the collaborative research project requires. A particular focus in this regard is the development of middleware that provides services and participating sub-systems on the basis of the client-server principle. The available functions are being structured as value-added services similar to apps on smartphones. The envisaged deployment in production is throwing up questions of real-time and security requirements among others.

The work group involved has for a considerable amount of time been concerned with the design of middleware and value-added services – with the pICASSO project which aims to create a cloud-based control platform focusing particularly intensively on these issues. With RetroNet, Fraunhofer IPK is conducting state-of-the-art research and development in close cooperation with SMEs that draw on the technical and economic needs of these enterprises.

Project partners

- PI Informatik GmbH
- Bosch Rexroth AG
- Finow Automotive GmbH
- Fraas und Richter Werkzeugbau GmbH
- AUCOTEAM GmbH
- KleRo GmbH Roboterautomation
- Lernfabrik Neue Technologien Berlin gGmbH
- Technische Universität Berlin IWF
- Universität Stuttgart ISW
- Fraunhofer IPK

Image: *Integration of existing machines into an Industrie 4.0 infrastructure with additional services*

MANAGED BY

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