Press Release

Modular production line for Industry 4.0
Bosch Rexroth presents flexible and efficient solutions for connected production

How can I profit from digitalization? Many companies are currently asking this question - specifically smaller companies - in connection with the hype topic Industry 4.0. During the Hannover Messe, Bosch Rexroth thus used a connected, intelligent production line to show how users can increase machine availability, flexibility, and productivity already today. The line connects fully automated and manual workstations on which Rexroth control units IndraControl XM21 or XM22 are produced. The open and flexible Rexroth automation solutions are linked with third-party robotics systems to form an integrated, connected facility. The special thing about it: the shown solutions function not only for facilities that are a completely new but also allow a connection to existing machines. Intelligent retrofitting allows facilities that are as of yet unconnected to send operating statuses and process data.

The production is consistently connected in five stations from the application of heat-conducting paste, through feeding (pick and place), tightening, manual assembly, to the testing station. The Manufacturing Execution System (MES) SAP-ME handles production control, whereby Bosch Rexroth with its open interfaces supports common MES systems. The Bosch IoT Cloud is also connected in this scenario in order to use big data algorithms to monitor the tightening process. A Remote Condition Monitoring System ensures high availability of the production line and in case of service quickly offers assistance while providing long-term diagnoses on the facility status.

Benefits overview:

- **Modular structure for more flexibility**
  The utilized Linear Motion System by Rexroth can at any time be expanded by additional component carriers and line. With it, end users can integrate additional stations with minimal effort or increase production capacity as needed.

- **For more transparency, all data is available in real-time**
  All work pieces are clearly identifiable via RFID technology in real-time with regard to type and status. The stations always retrieve the respective current work plans and return process data after processing, e.g. for quality control or process progress control. The communications platform ActiveCockpit filters, and visualizes all relevant data and serves as interactive communications platform
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between the individual software tools. This creates transparency and consistency of all relevant production data.

- **Status monitoring for more machine availability**
  The status of connected machines is monitored via predefined methods for data analysis. This data serves for Remote Condition Monitoring as well as quality control, process improvement, and predictive maintenance. This increases machine availability.

- **Integration of manual assembly stations and worker support**
  The assistance system ActiveAssist supports the associate at the manual workstation in the wide-ranging assembly. Light signals indicate which components must currently be removed from which container. The system recognizes the associate via bluetooth tag and adjusts the user interface to the level of knowledge and the associate’s favorite language. Active Assist then reviews the accuracy and completeness of the assembly steps. This reduces errors and contributes to workload reduction.

- **Model-based engineering for fast start-up**
  For reduced machine downtimes, users can use so-called model-based engineering to simulate and optimize new motion sequences during the active production process. At the demonstrator, Bosch Rexroth shows a solution with software by Dassault Systèmes. Starting with the construction of the machine, virtual models are created which continue to be used in the subsequent development phases. A code is generated based on existing information, which is executed directly on the control system. For a shorter development phase of the machine and shorter set-up times when changing workpieces and variants. OEMs can therefore commission the control unit parallel with the hardware assembly.