Connected Automation with OPC UA
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Next steps to Industry 4.0 …

Vertical and horizontal exchange of OPC UA data
Connected Automation with OPC UA

OPC UA Benefit -- Unified exchange of information

1. OPC-UA Base Information Models
Models for generally valid information are already specified by OPC-UA.
- Data Access (DA)
- Alarms and Conditions (AC)
- Historical Access (HA)
- Programs (Prg)

2. Technology-Specific Information Models
Derived from base models, other organizations are specifying their own information source, the so-called companion specifications.
e.g. PLC Open -- OPC-UA for Programmable Controllers based on IEC61131-3

3. Rexroth-Specific Information Models
Derived from base models. e.g. Axis, Robot, Parameter, Motion, Diagnosis Logbook,...
Open Core Engineering
Advanced OPC UA Functionality with Open Core Interface

The combination of OPC UA and OCI makes us ready for I4.0. It gives us the possibility to connect the Automation World and the IT World in an easy way.
Connected Automation with OPC UA
Advanced Data Access with OPC UA and Open Core Interface

**Standard Solution**
- Access to PLC variables
- PLC with symbols to provide data
- PLC is interface between actor/sensor level and HMI

**Future solution with OCI**
- Full access to all machine data
- PLC not necessary to provide data
- Control firmware is interface between HMI and actor/sensor level
WebConnector - Basics

- The WebConnector translates the protocols of the automation world into the language of the web world.
- Open communication interface for web data exchange via HTML5 (JavaScript / WebSocket)
- Standardized communication interface for automation data access using
  - OPC UA
  - OCI for Controls
Connected Automation with OPC UA
WebConnector – Customer Benefit

- Web connections to any HMI device
- Executable on all devices with “Java virtual machine”
- Data exchange with Rexroth controls using standardized protocols OPC UA and Rexroth Open Core interface (OCI).
- Ready to start and configurable via web interface
  - Diagnosis overview
  - Licensing dialog
  - Online documentation
  - Sample application
  - etc.
- WebConnector and "Java virtual machine" download
  www.boschrexroth.com/software-download
IoT Gateway Software
Basic Logic behind the IoT Gateway Software

Data is key
Goal in the industry: Connect all machines
Connect your machine with the IoT Gateway Software
IoT Gateway Software

"Left to Right Approach"

**Machine data**

Device apps
Get access to your machine data
Examples: Controls, sensors, OPC, etc.

and many more...

**The IoT Gateway Software Basic Apps**

Internal apps
Play with your machine data
Examples: Math calculations, formatter, dashboard, etc.

**IT Systems**

Processing apps
Send data to your preferred system
Examples: Microsoft Azure, Oracle IoT Cloud, MySQL, etc.

Bosch Energy & Building Solutions

Oracle IoT Cloud

Microsoft Azure

Analytics

Link to IoT Gateway

and many more…
Connected Automation with OPC UA

Key Facts and Summary

- Bosch Rexroth offers one of the largest OPC UA Information Models (PLC-Objects, Motion-Objects, Robot, field bus devices, alarms & conditions, ...)
- Bosch Rexroth supports the customers on the control not only on the OPC UA server, we support also OPC UA client.
- All information accessible through OCI is available in OPC UA standardized forms and will be extended continuously.
- Only Bosch Rexroth offers the possibility for the customer to go one layer deeper than OPC UA by using OCI. This enables individual and optimized solutions (real-time extensions, model-based engineering, co-simulation, HiL, etc.) without any breaks in consistency.
- Bosch Rexroth offers the WebConnector, which helps to create modern browser-based visualizations
- Bosch Rexroth offers with its IoT Gateway a perfect possibility to make new and old machines ready for Industry 4.0 (e.g. OPC DA to OPC UA without any changes on the machine program)
Connected Automation with OPC UA

I4.0 Showcase

Link to I4.0 Showcase
Questions?
Thank you very much for your attention