Agenda

- Company presentation
- KEBA KeMotion system
- Requirements of our customers to ROS
- Outlook
Who are we?

Industry experts in automation

Founded in 1968

Active worldwide

In private ownership

193 million euro turnover

87% export

20% R & D rate

1040 employees
Customers who trust KEBA
KeMotion
The complete solution for the automation of robots and machines
KeMotion
A complete system with 5 core components

Robotics
Turn-key robotic solution including
- Tool set
- Real World Simulation Package
- Wizards and Templates
- Ready-to-use robot programming language

PLC and Motion
Predefined PLC and Motion functions for machine and process control

Safety
Integrated and scalable safety controller for PLC, Motion and Robotics

Control and Drives
- All-in-one control and drive solution
- Modular multi-axes drives for space reduction of more than 50%

HMI
- Turn-key robotic teach-in solution
- Mobile pendants from the world market leader
KeMotion
For a wide range of applications

Painting • Welding • Grinding • Metal Bending • Palletizing • Pick & Place • Handling • CNC • Glueing • Wafer Handling • Service Robotics • Textile Printing • Die Casting • Plastics • etc.
KeMotion
The proven industrial complete solution for high-end robotics

- Highest QUALITY
- Absolute FLEXIBILITY
- Maximum AVAILABILITY
- Scalable HARDWARE RANGE
Open Source is not new to us
Requirements of our customers to ROS
Basics

Deliver a versioned package of the main ROS packages

- ROS Softwareunit

Offer a possibility to move the robot out of ROS

- Deliver an interface to our Robot Control
Integration of ROS

Program interpreter

Path planning

Look Ahead Interpolation
- safety checks, path prediction, limiter

Interpolation
- kinematics transformation
- dynamic robot model

KeMotion Robot Control

Axis 1
Axis 2
Axis n
Additional features

Offer a possibility to trigger PLC applications out of ROS

- Establish an ROS-interface to our PLC variable-tree

Offer a possibility to process cartesian coordinates out of ROS

- Enlarge commandset of RMI_Driver
rmi_driver package

- based on ros_industrial/robot_movement_interface
- create movement commands in ROS
- Plugin-based

https://github.com/smith-doug/rmi_driver
Additional features

Offer a possibility to upload an application to several units

✓ Develop a plugin for our PLC configuration Suite (KeStudio)
### ROS Trace

Connected to ROS!

<table>
<thead>
<tr>
<th>Timestamp</th>
<th>Sender</th>
<th>Msg</th>
</tr>
</thead>
<tbody>
<tr>
<td>1510040080</td>
<td>/robridge_websocket</td>
<td>[Client 22] Subscribed to /rosout</td>
</tr>
<tr>
<td>1510038091</td>
<td>/rosapi</td>
<td>Rosapi started</td>
</tr>
<tr>
<td>1510040108</td>
<td>/robridge_websocket</td>
<td>Client connected. 7 clients total.</td>
</tr>
<tr>
<td>1510040108</td>
<td>/robridge_websocket</td>
<td>[Client 23] Subscribed to /rosout</td>
</tr>
</tbody>
</table>
KEBA solution

- all in one platform
- PLC, Robotik, Safety, ROS
- 1 development tool for robotics and ROS
- no additional ROS PC
- full access from ROS to KEBA controller
KeMotion FlexCore
The open platform for powerful and versatile robotic applications
Open control architecture

Easy integration of new technologies
Integration Levels

- ROS core on IPC
- No interfaces

- ROS interface to basic system

- Full integration
- ROS with KeMotion technology features
Outlook

- Official release
- Further Development with industrial partners
- Multikinematic support
Visit us at the Demo of ROS-native hardware afterwards
Thank you for your attention!

www.keba.com