Integrated Robotics

Easier, Flexible Controls for Improved Machine Performance and Maintenance
Integrated Robotics

Challenges

- **Machine Builders & System Integrators** desire to integrate control of robots into the line controller; smaller footprint, architecture consolidation while gaining Machine & Line Flexibility
- **Plant Operations** extending plant-wide automation to robotics
- Changing time-to-market expectations makes it difficult to adapt quickly
- Explosion of SKUs challenges operational efficiency
- Line/cell controller and robot controller interlocking increase complexity and reduce performance
- Change in consumer demand reduces asset lifecycle
  - Significant capital investment is required
  - Production assets and processes lack flexibility

What is the Field of Integrated Robotics

Integrated Robotics is defined as the single line or cell controller controlling the robot, which can reduce the need for the dedicated robot controller and associated hardware components such as servo motors, drives, teach pendant and I/O.

In this way, a single controller can be used to control multiple robots and it can simplify integration and increase operational efficiency. Using not only common components for machine and robot control but also leveraging Integrated Architecture™ including Programmable Automation Controller, motion control, Studio 5000 Integrated Design Environment, and native support of kinematics can help reduce time and resources for robot system design and development.

Application

- Primary packaging
- Cartoning machine
- Case packer
- Palletizer
- Product handling
- Cosmetic packaging machines
- Blister packing
- Sausage / meat products packaging
- Medical devices packaging
- Cookie / chips packing lines

Industries

- Consumer packaged goods
- Home and personal care
- Pharmaceuticals
- Food & beverage
- Consumer electronics & computers, devices
Benefits of Integrated Robotics

- **OEMs** can take **full ownership** of the solution including parts and support.
- Easy product change over: **tool-less change**
  - Supports "one button" changeover
  - Shorter machine shut down required
- Communication via **EtherNet/IP™** enables easy access to information for **analytics**.
- Manufacturing **flexibility**:
  - Easily reconfigured for other products
  - Easily redeployed for new products: Reduce your machine and/or line footprint
  - Supports modular machine approach
  - Reduce engineering, training, spare parts and maintenance costs
- **Improved performance** and support
  - One system to service and support
  - Better coordination between robots and other motion
  - Simplified integration and better diagnostics by using single software for robot & machine control

Supporting Single Integrated Solution for Multiple Kinematics

- Cartesian
- DELTA
- SCARA
- Articulated
- H-Bot
**Rockwell Automation Capabilities**

## Key Technologies & Portfolio enabling Integrated Robotics

<table>
<thead>
<tr>
<th>Controllers</th>
<th>Motion</th>
<th>Vision</th>
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<tr>
<td>Single architecture to control Robotics system</td>
<td>Simplify machine design while improving Robotics performance</td>
<td>High speed with high accuracy and consistency</td>
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<tr>
<td>• Logix based scalable multi-disciplined control</td>
<td>• Integrated motion with safety</td>
<td>• Product position and orientation detection</td>
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<tr>
<td>• Scalable up to 2 - 100+ axis</td>
<td>• Servo and induction motor control</td>
<td>• Quality control and inspection</td>
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<tr>
<td>• Single software for multiple motion &amp; safety control</td>
<td>• CIP security communication</td>
<td>• Multiple partner products to choose from</td>
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<tr>
<td>• Integrated safety &amp; CIP Security over EtherNet/IP™</td>
<td>• Adaptive tuning</td>
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### Integrated Safety

Less unscheduled downtime and more protection for operators

- Single platform for safety logic, I/O and component
- Contemporary technology to improve equipment productivity (Zone Control, Safe-off)
- Safety consultants to assess, educate, design, and validate

### Design and Simulation

Sizing tool for selection of motion system and 3D simulation software for Robotics optimization

- Increase machine throughput
- Decrease energy consumption
- Test machine and system designs virtually
- Reduce time to design, Develop and deliver
- Mitigate design risk

### Visualization

Consistent look and feel for electronic operator interface terminals, distributed client/server HMI, and software

- Access data at every level of the enterprise
- Standard set of engineering objects
- Common software platform that tightly integrates with the control system

### Development Environment

**Studio 5000**

Simple development of complex robot control solutions in a single control platform and a collaborative engineering environment

- Single software to configure program and maintain applications
- Multi-language IEC 1131-3, multi-discipline, Multi-user, intuitive programming environment
- Native kinematics transformation

### Independent Cart Technology

Replacing conventional conveyor systems, new intelligent track and conveyor systems lower the cost of ownership and provide flexible pitching and product conveyance

- Increase throughput & efficiency
- Improve reliability & flexibility
- Modular, scalable and simple Integration
Tools & Templates optimized for Integrated Robotics

Reusable Standardized Program

- Simple and easy to implement
- Low memory footprint
- Clear documentation

Ready to Use HMI Design

- Standard faceplates can be developed once and re-used across multiple hardware platforms

Proven & Tested Add-On Instructions ("AOI") Library

- The AOI Library includes support for common robotic functions, i.e. conveyor tracking, vision based product detection, load sharing between multiple robots etc
- Robots are controlled from a Logix controller using Studio5000
- Tested program structure allows trouble free programming and commissioning

IioT Platforms and Technologies toward Smart Machines

- Embedded machine diagnostics & machine learning
- Scalable analytics – prescriptive analytics and Augmented Reality (AR)
- Data driven operation - Access to machine operation information (OEE) and performance dashboards
- Secure network infrastructure (from shop floor to top floor)
- Remote access for the machine builders
- System Security - change detection & controller log

[ Technology to enable Smart Machines ]
Supporting Your Business Every Step of the Way

Rockwell Automation can help you solve your robotics integration challenges so you can streamline your production line and get the best value for robotics and automation investments.

Industry Focused OEM Team

Your reputation rests on building machines and equipment that meet customer demands. Our technical consultants, engineers, and project managers can help you solve key issues and differentiate your company in a competitive global environment.

PartnerNetwork™

PartnerNetwork members are leading companies that have experience delivering products or services that are designed to work with our solutions. The collaboration among members helps streamline your supply chain, simplify project implementation, and receive the best value for your automation investment.

Training and Support

As your equipment lifecycle changes, so does your need for technical support. We give you the flexibility to choose the level of electronic and phone support you need, when and where you need it. From service to risk assessments, we provide training and support through the entire lifecycle of your automation equipment.

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100+ Consultants
700+ Field Services Professionals

13+ Years
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18 ISO-Certified Repair Centers
9 Exchange Hubs

19
LANGUAGES SUPPORT

200+
TRAINING COURSES

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Helping customers around the world maximize productivity and minimize risks

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AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kiezelbaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 863 0600, Fax: (32) 2 863 0640
ASIA PACIFIC: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

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