L11 – Smart Sensors for Your Architecture

Hands-On-Lab
The market is changing

Flexible systems that change more often

Increased collaboration between people and machines

Analytics evolution

Pressures to maximize OEE

Demand for Smarter Systems
BUSBINESS DRIVERS

**END USER**
- Faster Time to Market
- Improved Asset Utilization
- Enterprise Risk Management
- Lower Total Cost of Ownership
- Exceed Productivity & Efficiency Goals

**OEM**
- Flexibility
- Integration & Standardization
- Performance/OEE
- After Market Service & Support
- Total Cost to Design, Develop & Deliver
- Innovation to Drive Differentiation

**SMART MANUFACTURING**
**SMART MACHINES & EQUIPMENT**
THE CONNECTED ENTERPRISE
ROCKWELL AUTOMATION's VISION FOR SMART MANUFACTURING

SMART PLANTS

SMART MACHINES & EQUIPMENT

SMART DEVICES
- Sensors
- Actuators
- Intelligent Motor Control
- Automation Control
- Terminals
- Audio
- Video
Smart Sensing

- Visualisation
- Design Environment
- Information Software
- Logistics Programmable Automation Controller
- Mobility
- Proximity Sensors
- Photoelectric Sensors
- Ultrasonic Sensors
- Process Sensors
- RFID
- Code Readers
- Encoders
Smart Sensing Technologies

- **IO-Link**
  - A linking technology that provides low cost integration of smart devices using the same wiring

- **EtherNet/IP**
  - Embedded communication protocol directly linked into the controller

- **Studio 5000 / Add-On Profiles**
- Move information and diagnostics frictionless from devices to the highest value generation systems

Seamless information flow from the device to where it provides the largest value
DESIGN
See faster times to market when you use one tool to design, configure and program your machine and devices

• Simplifying cabling
• Common design environment (Studio5000)
• Integration into the architecture
• Helps improve time to market (TTM)

OPERATE
Connect to your operations with an automation control system that allows you to operate from a central location

• Automatic Device Configuration (ADC) reduces errors upon sensor replacement configurations stored in the controller are automatically sent to the new device
• Faceplates for advanced sensor management from PanelViews or FTView
• Multiple Profiles facilitate flexible manufacturing by reducing changeover time for each sensor from minutes to seconds
• Helps increase overall equipment effectiveness (OEE)
• Mean time between failure (MTBF)

MAINTAIN
Increase productivity with access to real time data allowing you to take corrective action before unnecessary downtime

• Real-time diagnostics
• Timestamping (events, inputs)
• Monitoring
• Reduces mean time to repair (MTTR)
Design – Simplifying your Architecture

With IO-Link:
- Single type of wiring (3-wire)
- Single configuration platform (Studio 5000)

Point IO Solution

Armoblock Solution

PanelView (w. Faceplates)

EtherNet I/P

48CR Code Reader

Photo Sensor

Color Sensor

Actuator / Valve Manifold

Process / Analog Sensor

Inductive Proximity

Photo Sensor

Color Sensor

Process / Analog Sensor

Inductive Proximity

Actuator / Valve Manifold
Design - Common Design Environment

Studio 5000 IO-Link Master AOP

- CompactLogix™ Controller
- IO-Link Master
- IO-Link Sensor

IODD File Registrar

Studio 5000 IO-Link Master AOP Device Screen

- Studio 5000 Tag Database
Operation

Product Changeover

- Multiple sensor profiles stored in the Logix controller
- Extensive range of Sensor parameters available
- Downtime minimized and machine throughput increased by 5%-10%
- Minimizes the scrapping of products
Sensor replacement with Automatic device Configuration

- Sensor heartbeat information optimizes operational reliability
- Easily locate defects even in the largest machine
- Automatic Device Configuration (ADC) minimizes downtime
- Application Specific naming (ASN) pinpoints device needing attention
Diagnostics

- Actionable data to help maximize Overall Equipment Effectiveness (OEE) and Meantime Between Failure (MTBF)
- Optimize preventative maintenance and troubleshooting
- Reduce issue resolution during commissioning by up to 90%
- Reduce changeover time for each sensor from minute to seconds
- Multiple profiles facilitate flexible manufacturing
With Smart Sensors available for pressure, temperature, distance, motion, level and flow - it is possible to get a comprehensive view of your process. Knowledge of current sensor situation and status also ensures timely identification of any type of potential sensor issue.

Is there a sensor problem we are running into?

Is the right sensor setup loaded?

Parts Count: 1300

Signal Strength: 0500

Temperature °C: 0065

Low Margin: 0750

Low Margin! Cleaning required

Pressure psi/bar: 0050

Position mm: 0750

Damaged Sensor
Zone 1, Conveyor

Shift change – load new sensor profile

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# Smart Sensors Product Portfolio

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>42iT</td>
<td>Photoelectric Sensors, small rectangular housing, IP69K, Teachable, Red LED and Laser models</td>
</tr>
<tr>
<td>42EF</td>
<td>Photoelectric Sensors, universal M16 and square mounting, IP69K, Teachable, Red LED, Temperature and Counter Function</td>
</tr>
<tr>
<td>45LMS</td>
<td>Laser Distance Sensors, 8m, 15m and 50m distance, discrete and analog output, Window Teach, IP67</td>
</tr>
<tr>
<td>45CRM</td>
<td>Colour Registration Mark Sensors, RGB Sensor, 40μs response time, 2 outputs, IP67</td>
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<tr>
<td>871C</td>
<td>Miniature Inductive Sensors, 3mm to 5mm dia, Temperature and Counter Function, IP67</td>
</tr>
<tr>
<td>871TM</td>
<td>Long Range Total Metal Sensors, M8, M12, M18, M30 Barrel, 3x sensing range, IP69K</td>
</tr>
<tr>
<td>871FM Metal Flat Pack</td>
<td>Miniature Flat Pack Inductive Sensors, Temperature and Counter Function, IP67</td>
</tr>
<tr>
<td>873P</td>
<td>Ultrasonic Sensors, sensing range up to 6m, 1xPNP, 2xPNP, analog current and voltage output</td>
</tr>
<tr>
<td>85eP</td>
<td>Solid State Pressure Sensors, 1 to 550 bar range, analog output, 1 or 2 discrete outputs</td>
</tr>
<tr>
<td>837T</td>
<td>Solid State Temperature Sensors, -50°C to 250°C range, analog output, 1 or 2 discrete outputs</td>
</tr>
<tr>
<td>1734</td>
<td>Point IO-Link Master, In Cabinet IP20, 4x IO-Link channels,</td>
</tr>
<tr>
<td>1732</td>
<td>IP67 IO-Link Master, 4 ports M12, 8x IO-Link channels, EtherNet/IP, DL&amp;R and Time Stamp</td>
</tr>
<tr>
<td>56RF</td>
<td>Industrial RFID HF, 13.56MHZ CODE standard, SLI and FRAMTags, Transceivers, Handhelds, EtherNet/IP</td>
</tr>
<tr>
<td>48CR</td>
<td>Industrial Code Reader Camera, 1D and 2D codes, DPM Codes, EtherNet/IP</td>
</tr>
<tr>
<td>812E</td>
<td>EtherNet/IP Encoder, high resolution, single &amp; multiturn, DL&amp;R</td>
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</tbody>
</table>

**Q1 2018**

**Q3 2018**

**Series B available**
About this Lab

- Section 1: Design
  - Configuring your system
- Section 2: Operate
  - Faceplates
- Section 3: Maintain
  - Timestamp
Thank You!