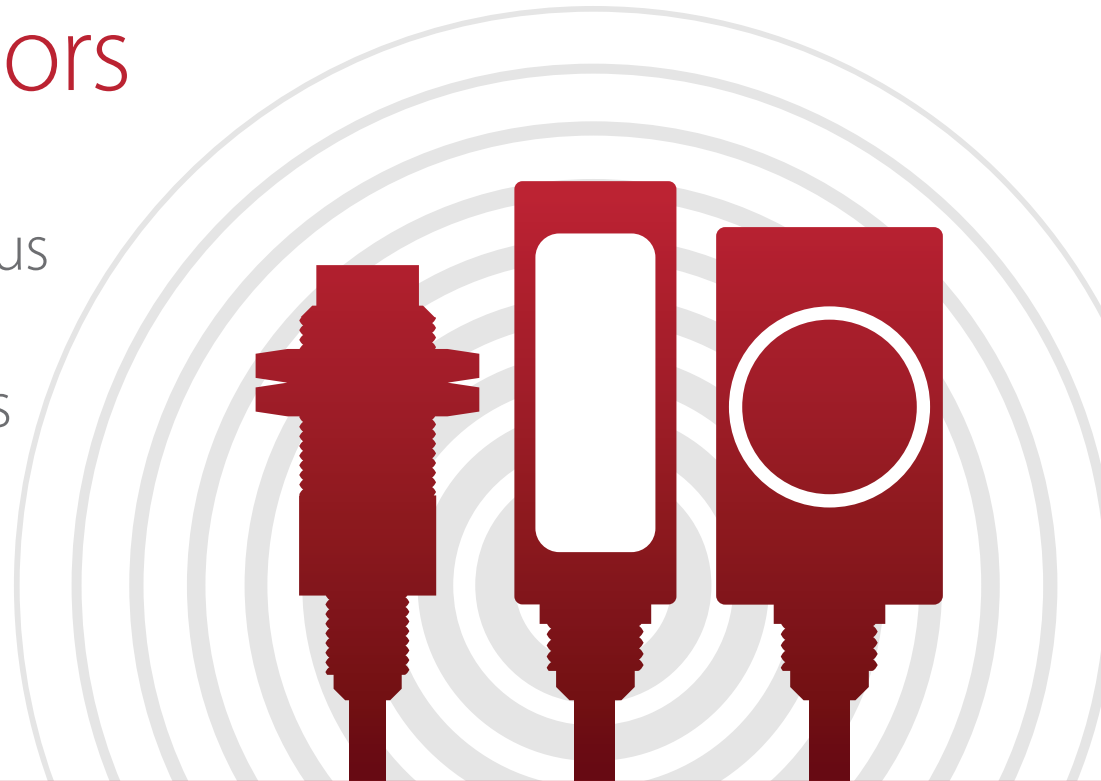


LISTEN.  
THINK.  
SOLVE.®

## Integrated Smart Sensors

- Increase productivity
- Minimise downtime with continuous process and diagnostic data
- Enable faster product change-overs
- Speed-up machine commissioning
- Enable smarter machines for use in The Connected Enterprise



**Rockwell  
Automation**

 Allen-Bradley • Rockwell Software

# The eyes and ears of efficient machines and equipment

Unless you are aware what is happening on machines installed in factories minute-by-minute, it is impossible to maintain optimum productivity and efficiency at all times, or to avoid unplanned downtime and loss of production. Conventional sensors can provide only a limited amount of information, but lack the capability to offer diagnostic or parameter data to exchange with a controller.

An integrated Smart Sensor solution provides all the data required to create a comprehensive picture of the status of an enterprise at any particular moment. As integral components of The Connected Enterprise, Smart Sensors can also facilitate the introduction and operation of smart machines, for even greater efficiency and productivity.

Integrated Smart Sensor solutions can help provide at least

# 5-10%

Production increase



## Sensor costs

- Set-up and maintenance of multiple sensing technologies
- Re-teaching at every production change-over
- Analog signal converting
- Replacement of damaged sensors
- Installation and wiring
- Machine commissioning
- Failure analysis
- Numerous sensor variants



## Why sensors fail

- Low margin due to dust
- Mechanical damage during production
- Incorrect set-up or instruction
- Cable break
- Swapped cable
- Material or target change during production change-over
- Contamination
- Component failure
- Short circuit



## Cost of downtime

- Loss of production
- Manufacturing scrappage
- Establishing cause of failure (mechanical/electrical)
- Sensor replacement costs
- Safety issues
- Impact on other equipment



## Maintenance options

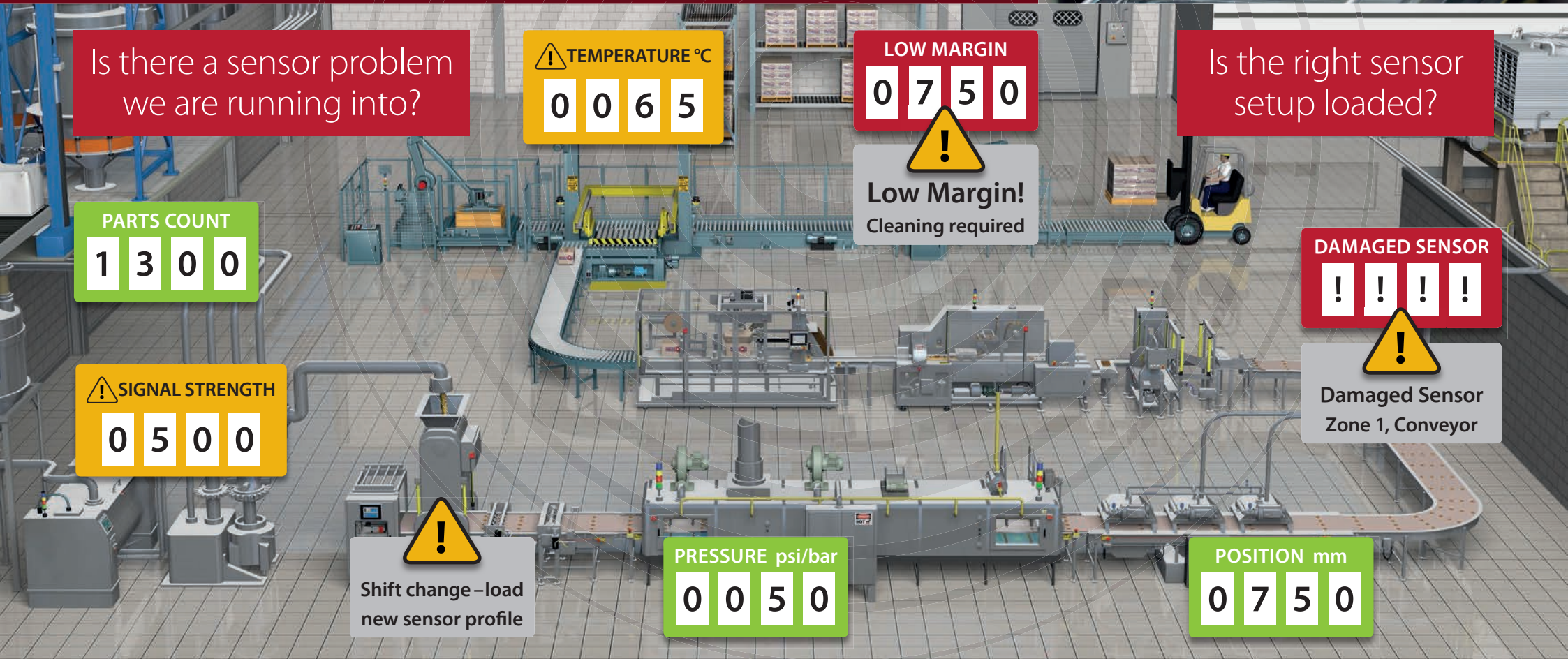
- Advanced diagnostic information
- Preventative not reactive maintenance
- Planned downtime possible
- Taking control of your plant
- Reduced maintenance costs



## Increased productivity

- Reducing unplanned downtime improves productivity
- Take control of your production process
- Make fact-based decisions with advanced diagnostic information
- Faster production change-over due to multiple sensor profiles
- Faster device change-over due to auto device configuration

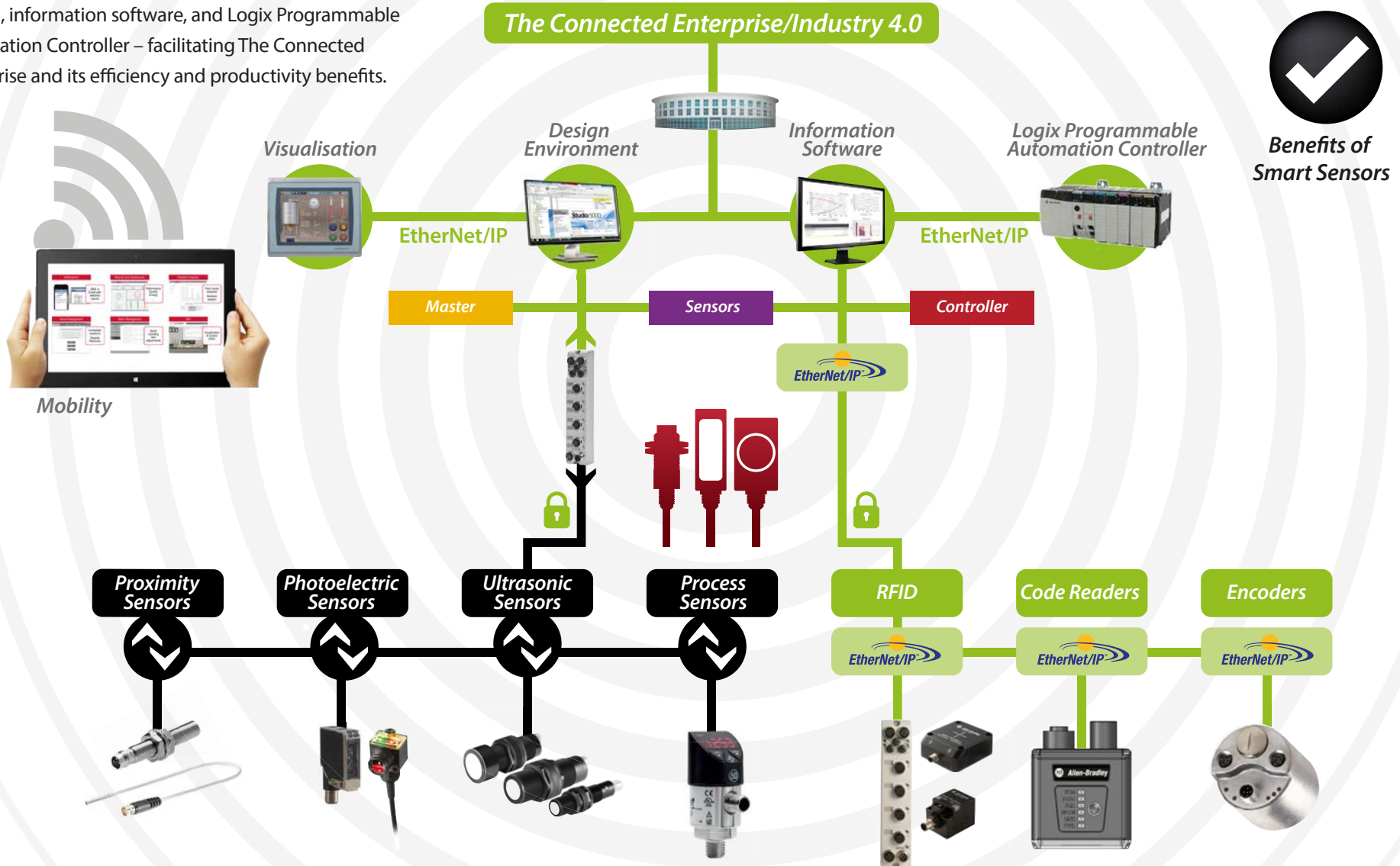
*With Smart Sensors available for every possible parameter – from pressure to temperature, motion to distance, level to flow and many more – it is possible to sustain a comprehensive view of your process. Knowledge of current sensor situation and status also ensures timely identification of any type of potential sensor issue.*





# Integrated Smart Sensors

Smart Sensors provide a continuous flow of valuable process- and diagnostic data to your design environment, visualisation system, information software, and Logix Programmable Automation Controller – facilitating The Connected Enterprise and its efficiency and productivity benefits.



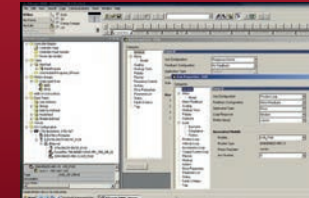
# Creating The Connected Enterprise with Smart Sensors for Smart Machines



Smart Sensors are programmed directly within Studio 5000®



Just one development environment for configuring and programming sensors



Add-On-Profiles for simplified machine development, use and maintenance

Integration of the Allen-Bradley Integrated Smart Sensor Solution into the Logix control platform helps reduce your programming time, eases start-up and commissioning, and streamlines diagnostics. By providing consolidated controller programming and device system configuration, operation, and maintenance in the single software environment of Studio 5000 engineering environment, Premier Integration helps reduce complexity and errors.



Mobility-enabled – putting all relevant sensor data always at your fingertips



## Faster Time to Market

- Program sensors and controller in same software environment (Studio 5000® software)
- Intuitive programming simplifies initial set-up and helps eliminate logic errors
- Seamless integration with the Rockwell Automation Integrated Architecture



## Lower Total Cost of Ownership

- No incremental cost for Smart Sensors
- No wiring changes required when moving from Rockwell Automation hardware Sensors to Smart Sensors
- Premier Integration reduces complexity and errors
- Reduced engineering time
- Fully-configurable sensors reduce device inventory and streamline SKUs by 50%



## Improved Asset Utilisation

- Easy access to actionable, contextualised data that can help maximise Overall Equipment Effectiveness and Mean Time Between Failures
- Real-time diagnostics optimise preventative maintenance and troubleshooting, reducing issue resolution time by up to 90%
- By reducing changeover time for each sensor from minutes to seconds, multiple profiles facilitate flexible manufacturing



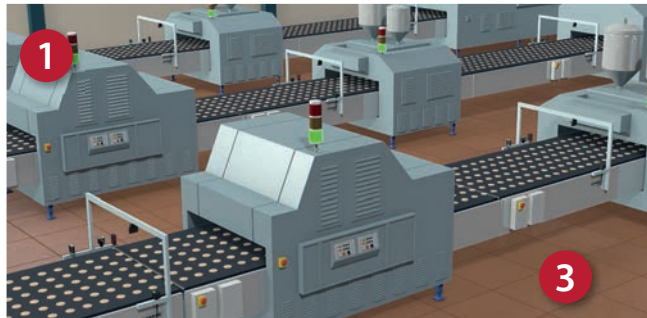
## Enterprise Risk Management

- Automatic Device Configuration capabilities reduce errors when replacing sensors
- Configuration changes restricted to authorised personnel only
- BOM compliance assured

# Scenario 1

## Operations Information with Mobility

- Comprehensive real-time data on production
- Process data including triggered output and measurement data
- Diagnostic data on sensor health and communication status
- Device profile data including set point and threshold data
- Monitoring and trending data on signal strength, contrast, gain



1. Machine operating normally



2. Sensor detects dust build-up



3. Operator informed about type of sensor and the location of it in real time



4. Timely preventive action taken



5. Safe operating parameters restored



6. Monitoring continues



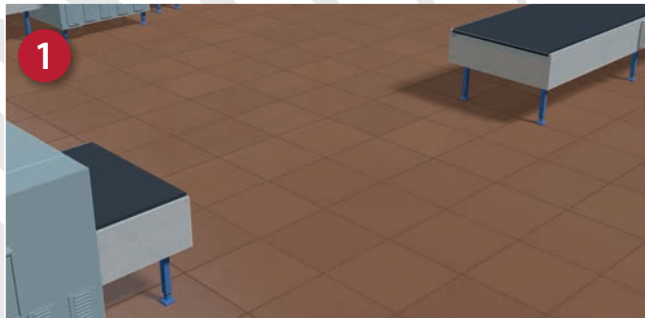
SCAN THE QR CODE to see how Integrated Smart Sensors can make the difference



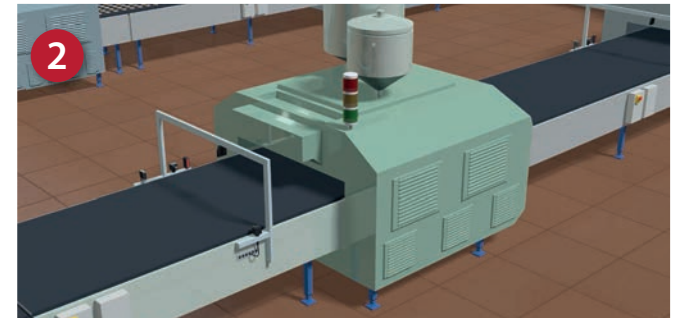
# Scenario 2

## Smart Commissioning with Smart Sensors and Mobility

- Actionable data to help maximise Overall Equipment Effectiveness and Mean Time Between Failure
- Optimise preventative maintenance and troubleshooting
- Reducing issue resolution during commissioning by up to 90%
- Reduce changeover time for each sensor from minutes to seconds
- Multiple profiles facilitate flexible manufacturing



1. New machine required



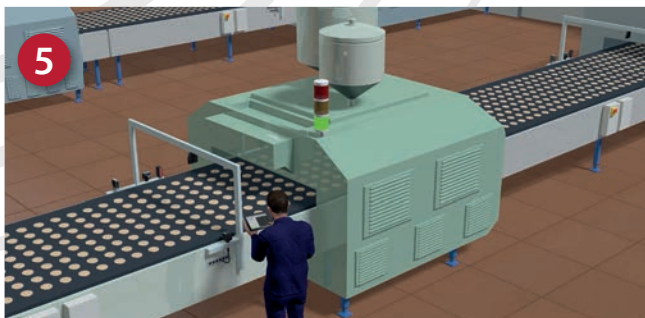
2. Pre-engineered machine delivered



3. Smart Sensor monitors set-up parameters



4. Fast readjustments for performance increase



5. Machine running at full speed



6. Continual smart monitoring of wide range of values in FactoryTalk Software

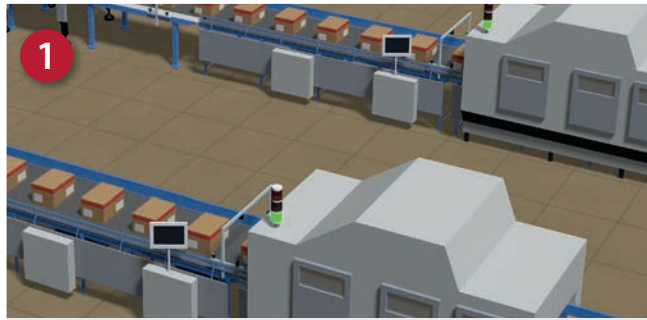


SCAN THE QR CODE to see how Integrated Smart Sensors can make the difference

# Scenario 3

## Sensor Replacement with Automatic Device Configuration

- Sensor heartbeat information optimises operational reliability
- Easily locate defects even in the largest machine
- Automatic Device Configuration minimises downtime
- Application Specific Naming (ASN) pinpoints device needing attention



1. Device operating normally



2. Sensor heartbeat information to plc lost



3. Application Specific Naming information (ASN) guides the operator directly to the fault



4. eBOM provides the device vendor data and part number for easy and fast replacement



5. Automatic Device Configuration downloads and configures in milliseconds.



6. Device quickly operational again, after minimal downtime.



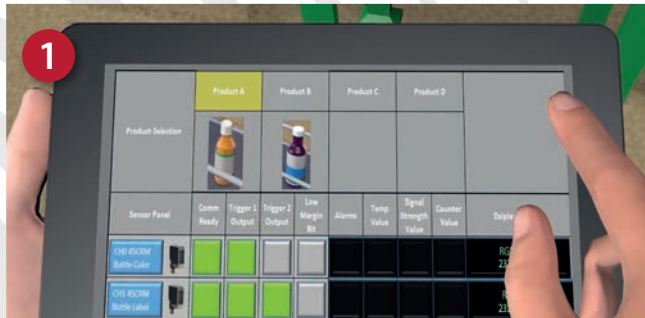
SCAN THE QR CODE to see how Integrated Smart Sensors can make the difference



# Scenario 4

## Product Changeover

- Multiple sensor profiles stored in the Logix controller
- Extensive range of sensor parameters available
- Downtime minimised and machine throughput increased by 5 to 10%
- Minimises the scrapping of products



1. Machine set-up for production of Product A



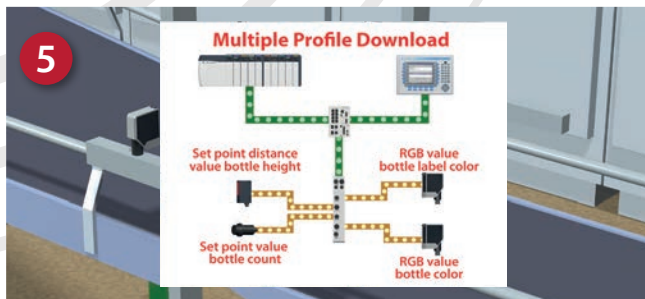
2. Smart Sensors configured on the conveyor with parameters for Product A



3. Time for product change-over



4. New production initiated



5. Multiple Profile Download simultaneously on four sensors



6. Smart sensors have new parameters set for Product B – machine ready to start



SCAN THE QR CODE to see how Integrated Smart Sensors can make the difference

# Scenario 5

## Smart Tracking and Tracing

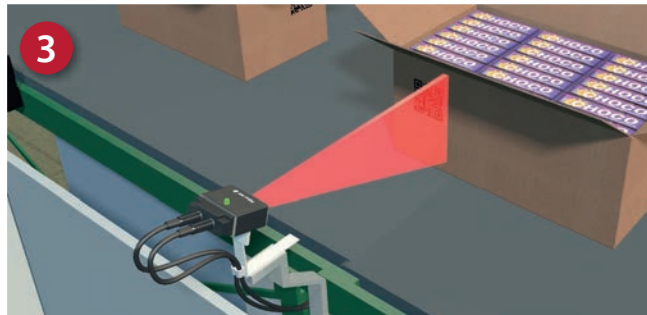
- Radio Frequency Identification / RFID
  - Increased production efficiency and supply chain visibility with detailed tracking of who, when, where and what was done to build products
- Barcode readers
  - High performance item level tracking for increased efficiency and better supply chain visibility
- Integrated identification products
  - Intuitive programming
  - EtherNet/IP with Device Level Ring (DLR) assures redundant network
  - Integrated in Studio5000 offering a single design and programming environment
  - The modular, integrated FactoryTalk ProductionCentre software suite delivers comprehensive production management functionality



1. Tracking and identifying at item level on production line



2. Connected to Logix Controllers over EtherNet/IP, and programmed by Studio 5000



3. Tracking and identifying packed products



4. Real time data processed in FactoryTalk ProductionCentre software suite to maximise production efficiency



5. Products and raw material tracked at every stage from manufacture to dispatch and beyond











6. One engineering environment with Studio5000 for configuring and programming of all facets: Logix, HMI, Stratix 5700, PowerFlex, Kinetix, MES, Stratix 5700

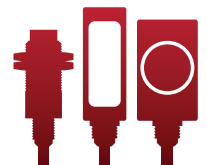


SCAN THE QR CODE to see how Integrated Smart Sensors can make the difference

# Smart Sensors Overview

<b>42JT</b>		Photoelectric Sensors, small rectangular housing, IP69K, Teachable, Red LED and Laser models
<b>42EF</b>		Photoelectric Sensors, universal M18 and square mounting, IP69K, Teachable, Red LED, Temperature and Counter Function
<b>45LMS</b>		Laser Distance Sensors, 8m, 15m and 50m distance, discrete and analog output, Window Teach, IP67
<b>45CRM</b>		Colour Registration Mark Sensors, RGB Sensor, 40µs response time, 2 outputs, IP67
<b>871C</b>		Miniature Inductive Sensors, 3mm to 5mm dia, Temperature and Counter Function, IP67
<b>871TM</b>		Long Range Total Metal Sensors, M8,M12,M18, M30 Barrel, 3x sensing range, IP69K
<b>871FM</b>		Miniature Flat Pack Inductive Sensors, Temperature and Counter Function, IP67
<b>873P</b>		Ultrasonic Sensors, sensing range up to 6m, 1xPNP, 2xPNP, analog current and voltage output

<b>836P</b>		Solid State Pressure Sensors, -1 to 550 bar range, analog output, 1 or 2 discrete outputs
<b>837T</b>		Solid State Temperature Sensors, -50°C to 250 °C range, analog output, 1 or 2 discrete outputs
<b>1734</b>		Point IO-Link Master, In Cabinet IP20, 4x IO-Link channels,
<b>1732</b>		IP67 IO-Link Master, 4 ports M12, 8x IO-Link channels, EtherNet/IP, DLR and Time Stamp
<b>56RF</b>		Industrial RFID HF, 13,56MHZ ICODE standard, SLI and FRAM Tags, Transceivers, Handhelds, EtherNet/IP
<b>48CR</b>		Industrial Code Reader Camera, 1D and 2 D codes, DPM Codes, EtherNet/IP
<b>842E</b>		EtherNet/IP Encoder, high resolution, single & multturn, DLR





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