Smart Machine – Safer and more secure

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Klinkmann Automation Oy
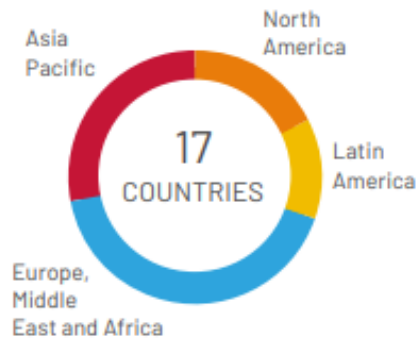
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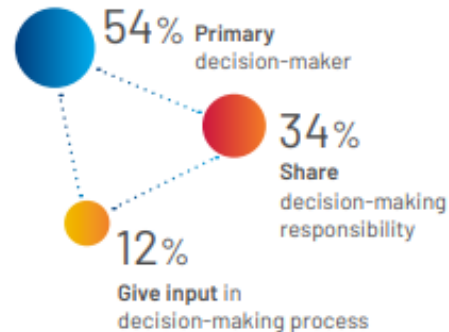
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Overview

Over 1,500 manufacturers around the world contributed to this year's State of Smart Manufacturing Report. The survey reveals optimism as advanced industrial operations technology delivers results that offer hope in the face of evolving economic conditions, labor shortages, skills gaps and cybersecurity concerns.

The 9th annual edition of the State of Manufacturing Report is the largest to date. **1,567 decision-makers** from **17 of the top manufacturing countries** took part, nearly two-thirds of whom (64%) work for firms with **over $1B in revenue**.
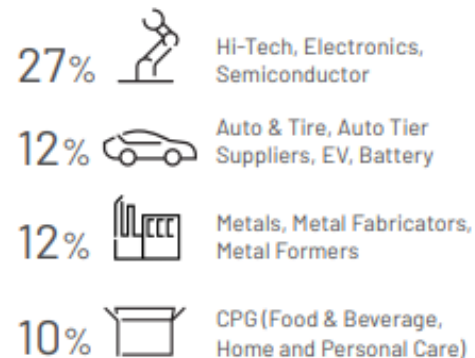
WHAT IS Smart Manufacturing?

"

Smart Manufacturing is the intelligent, real-time orchestration and optimization of business, physical and digital processes within factories and across the entire value chain. Resources and processes are automated, integrated, monitored, and continuously evaluated based on all available information as close to real time as possible."

MESA International

GEOGRAPHIC SPLIT

17 COUNTRIES

- Asia Pacific
- North America
- Latin America
- Europe, Middle East and Africa

RESPONDENT ROLES

54% Primary decision-maker

34% Share decision-making responsibility

12% Give input in decision-making process

TOP INDUSTRIES SURVEYED

27% Hi-Tech, Electronics, Semiconductor

12% Auto & Tire, Auto Tier Suppliers, EV, Battery

12% Metals, Metal Fabricators, Metal Formers

10% CPG (Food & Beverage, Home and Personal Care)

View all **survey demographics**

This report from **Rockwell Automation**, in association with **Sapio Research**, includes **a plan for taking action** alongside the research findings to help you turn insights into action. Refer to our **glossary of AI-related terms** used throughout the report.

What are examples of **smart manufacturing technology?**

INDUSTRIAL OPERATIONS

Manufacturing Execution Systems (MES) track and document the transformation of raw materials into finished goods, providing real-time production management to drive enterprise-wide compliance, quality and efficiency.

Production Monitoring provides seamless connectivity to machines on the plant floor, delivering transparent, real-time operational KPIs like Overall Equipment Effectiveness (OEE).

Enterprise Resource Planning (ERP) automates front- and back-office processes across business management and related functions.

Distributed Control Systems (DCS) use decentralized elements to control dispersed systems, such as automated industrial processes or large-scale infrastructure systems.

Supply Chain Planning (SCP) combines data from multiple departments to sync demand and supply forecasting to improve inventory accuracy and production management.

Computerized Maintenance Management Systems (CMMS) help organizations track and manage maintenance and repair activities for their facilities, equipment and other assets in one place.

Quality Management Systems (QMS) standardize and automate quality documentation, processes and measurements.

Production Logistics delivers an orchestrated, agile, zero touch material flow through manufacturing operations with autonomous mobile robots (AMRs).

Asset Performance Management (APM) combines process, operational and machine-level data through dashboards to monitor machine and plant health.

Analytics use data to solve manufacturing bottlenecks, optimize output and quality and provide new insights, tapping into the power of Industrial AI.

Design & Visualization tools transform raw ideas into intuitive HMIs and immersive VR simulations for smarter, faster production.

Robotics accelerate autonomous / semi-autonomous operations and contribute to systems that are more intelligent, intuitive and flexible.

Power Control drives continuous flow of valuable process and diagnostic data that informs the design environment, visualization systems and information software.

Smart Devices are self and system-aware assets that acquire, process and monitor operating data.

Industrial Control Systems improve processes and production quality at every stage of your operation and provide seamless data exchange.

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Smart Machine - Digital transformation
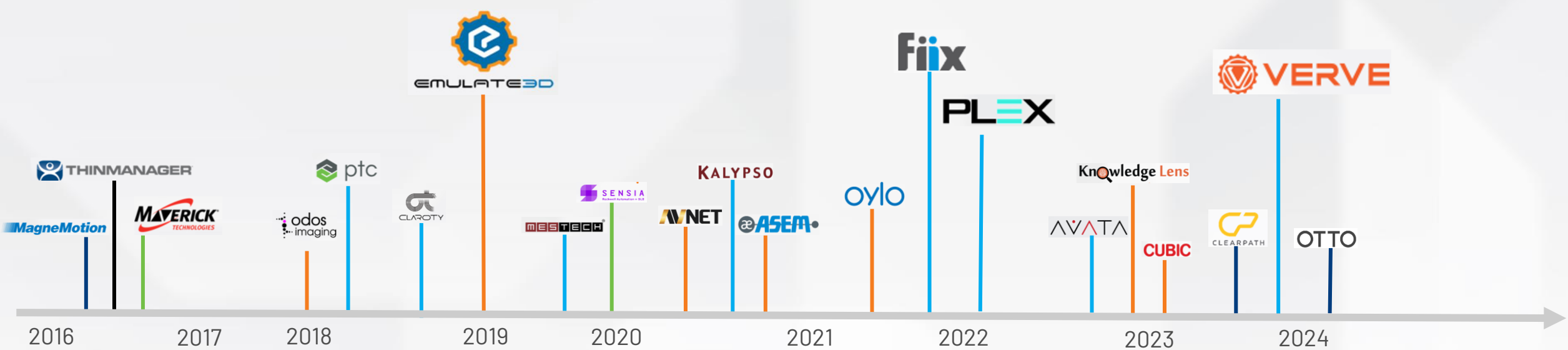
A Smart Machine is

- Connected and integrated
- Real-time information-enabled
- Safer and more secure
- Provides remote access

Transforming data into information to optimize production

Real-time data

Safer and more secure

Analytics

Connected

Predictive/preventive maintenance

Technology to enable Smart Machines

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# Enabling through innovations and acquisitions

- Fiix® – Cloud-based platform to plan, track and optimize your maintenance in one place
- Plex Smart Manufacturing Platform™ – Driving digital transformation with cloud Manufacturing Execution System (MES)
- Emulate3D™ Digital Twin – Digitally bringing your mechanical designs to life

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Smart Machine - Connected

Connected

- Support industrial networking with standard EtherNet/IP™ protocol

- Expand digital connectivity and interoperability with third-party devices and Cloud interfaces via OPC UA

- Enable seamless connectivity with Cloud MES systems and maintenance systems
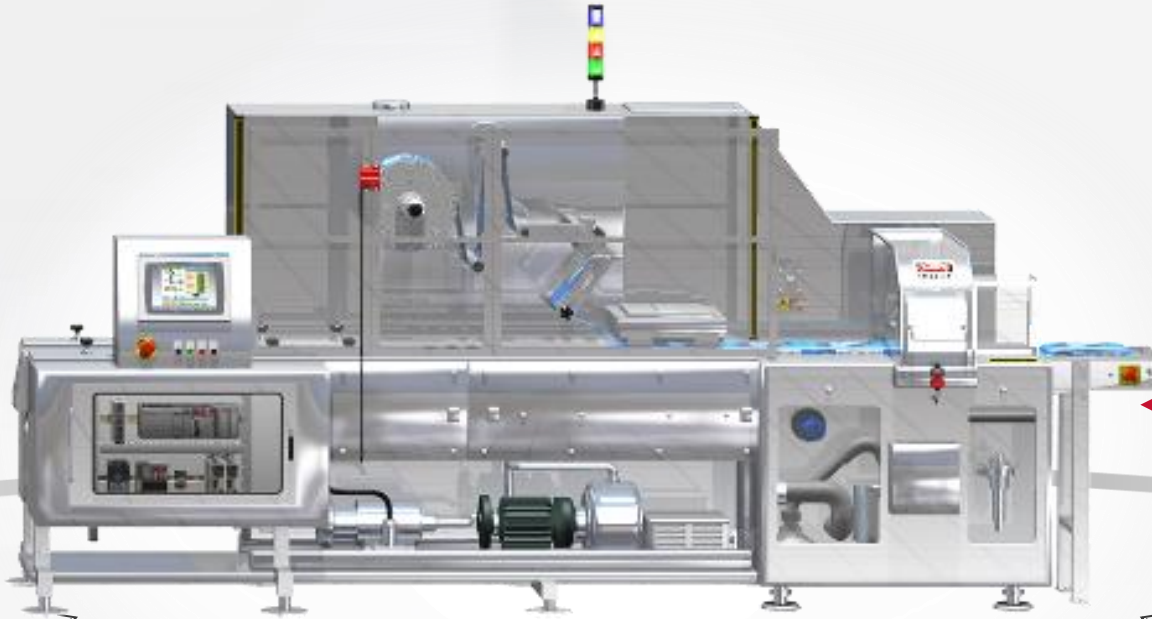

Connected

Rockwell Automation
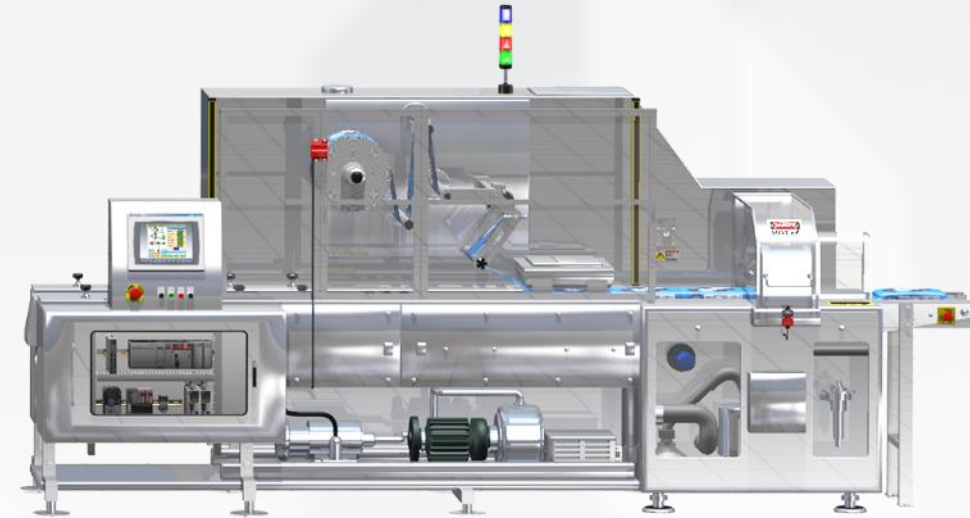
Real-time information

Real-time data

Voltage, Kwh, running time, temperature, **margin...**

Information

CONTEXTUALIZATION
Dust builds up on conveyor sensor

Knowledge

ANALYTICS
Sensor will fail with production loss

Optimize

ACTION
Maintenance team to clean the sensor

TECHNOLOGY + **PROCESS** + **PEOPLE**
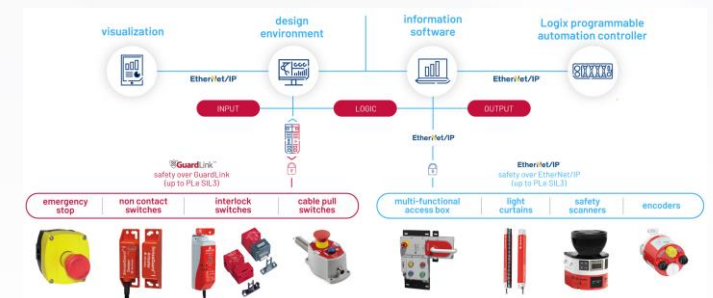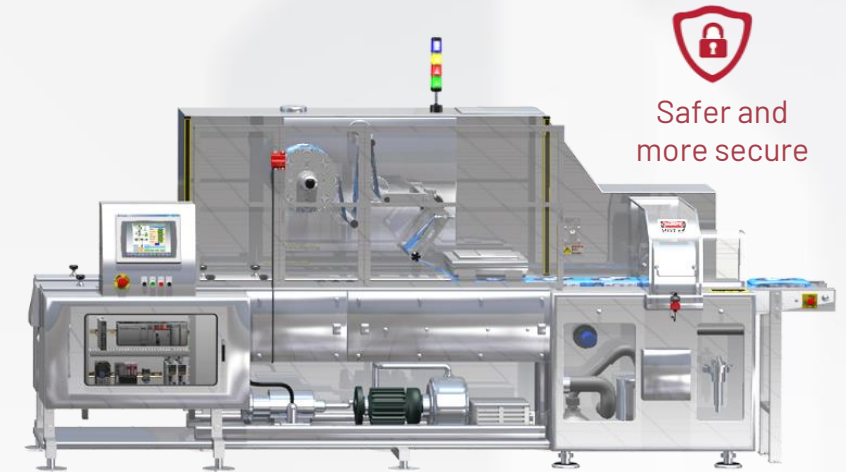
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Smart Machine – Safer and more secure

- **Safety**
  - Scalable and integrated safety solutions (PLe, PLd)
  - Safety implementation based on ISO 13849-1, IEC 62061
  - Integrated Smart Safety solution

- **Security**
  - Security from the core of development to deployment
  - CIP Security™ provides a final layer of defense against malicious communication
  - Help protect against threats NERC CIP™, NIST 800-53, and NIST 800-82
  - Industrial cybersecurity standard IEC 62443-4-2

Safer and more secure
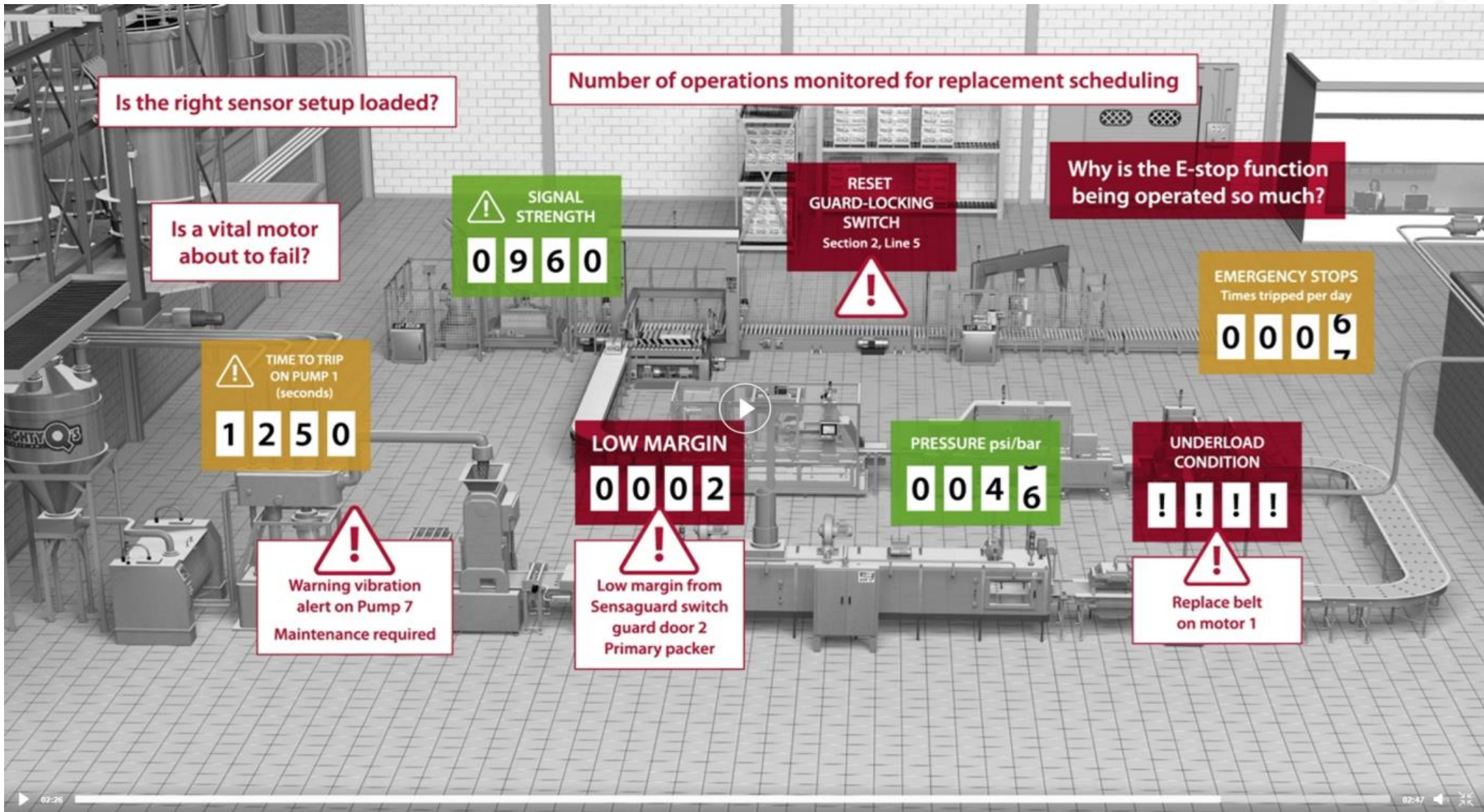
A Complete Safety portfolio – from the Global Market Leader

Delivering a Full Safety Solution
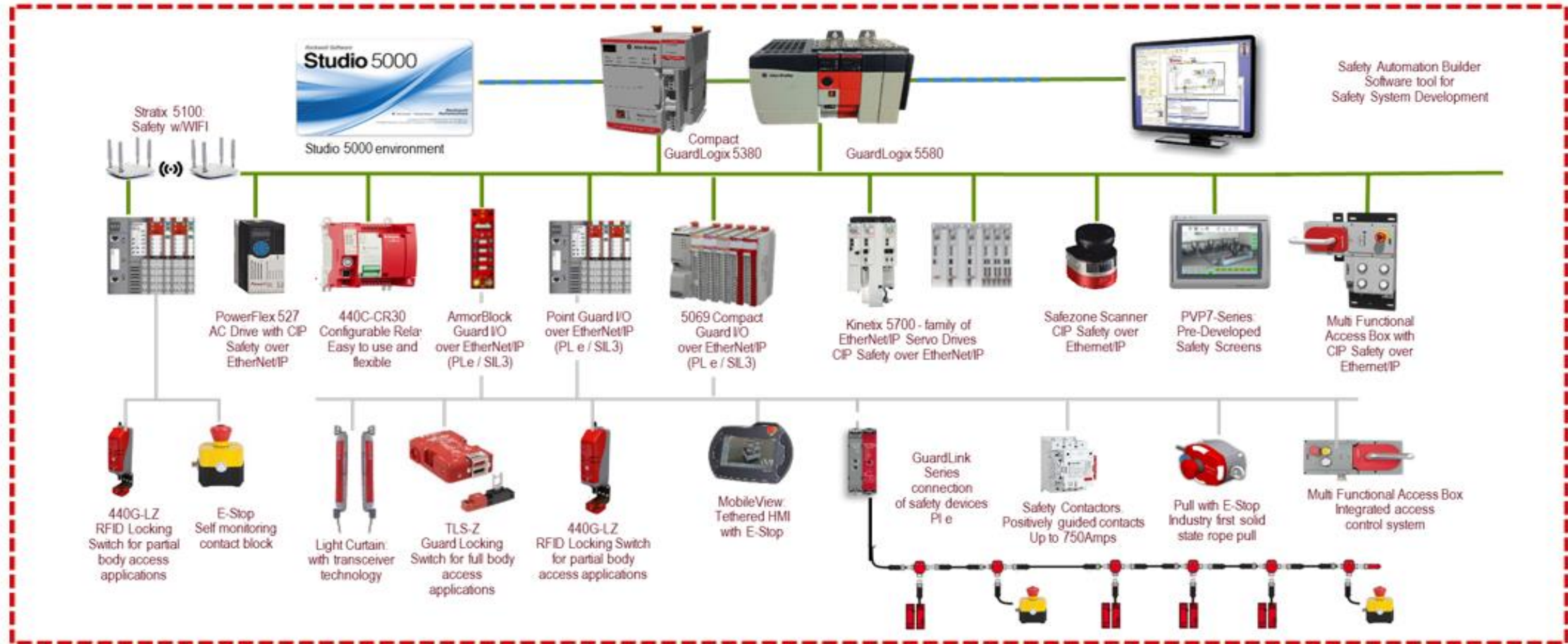
Products and tools to help develop a complete safety solution, supported by TUV certified Engineers

Rockwell Automation – An automation supplier that understands safety and is the market leader

Smart Safety Devices

THE CONNECTED ENTERPRISE/INDUSTRY 4.0

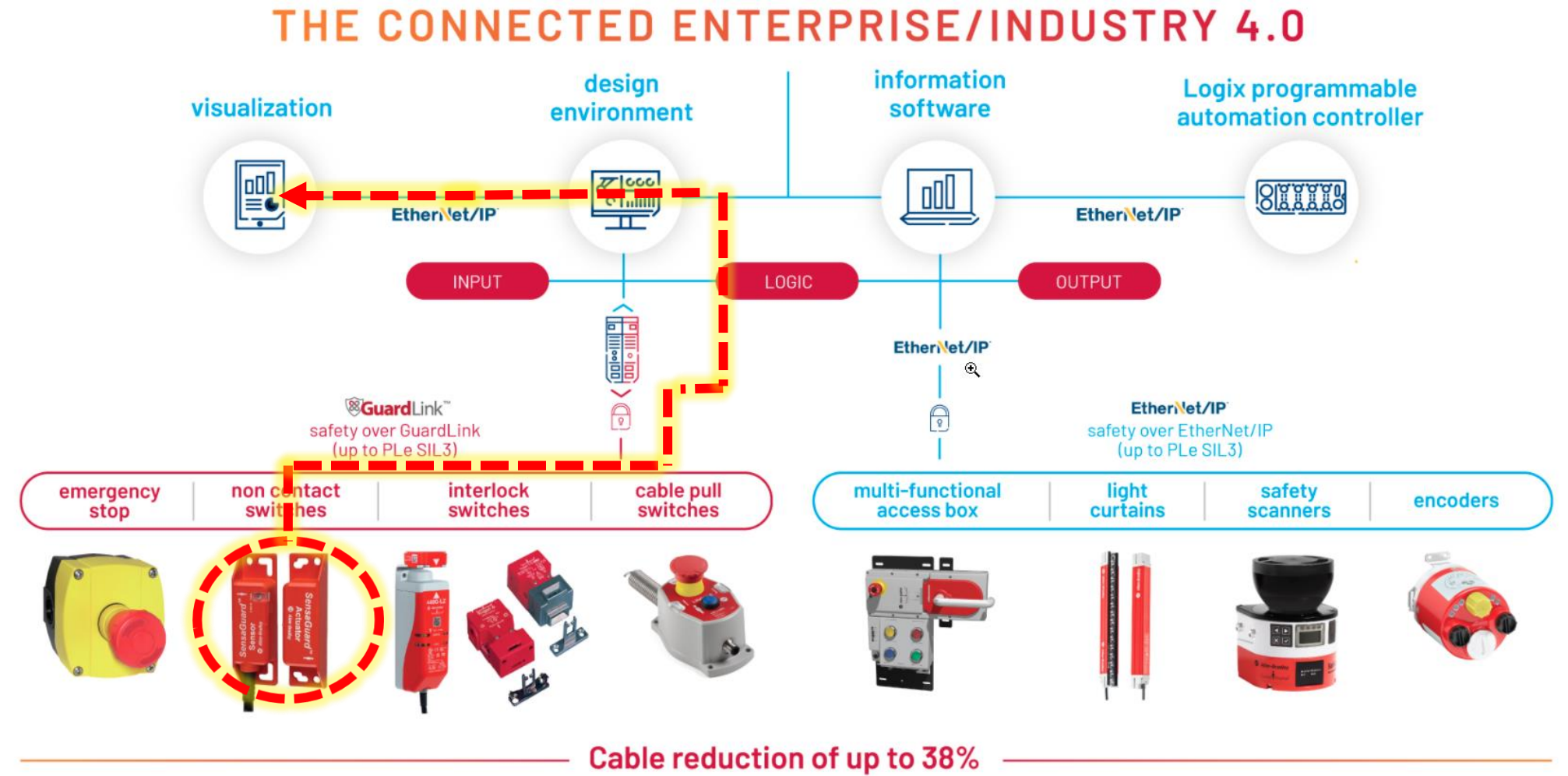visualization   design environment   information software   Logix programmable automation controller

EtherNet/IP   EtherNet/IP

INPUT   LOGIC   OUTPUT

EtherNet/IP

GuardLink
safety over GuardLink
(up to PLe SIL3)

EtherNet/IP
safety over EtherNet/IP
(up to PLe SIL3)

emergency stop | non contact switches | interlock switches | cable pull switches

multi-functional access box | light curtains | safety scanners | encoders

Cable reduction of up to 38%

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CompactLogix® 5380 controllers – Architecture towards Smart Machine

Cybersecurity
- IEC 62443-4-2 compliant
- Help protect Integrity
- Availability

Integration with business systems
- Connected Enterprise®
- OPC UA (version 36 onwards)

Scalable safety
- Right size safety systems (SIL 2 PLd / SIL 3 PLe)
- Productivity
- Sustainable business

Low carbon footprint
- Low power consumption
- Reduced BOM per system

Flexibility
- Local I/O solution and Remote I/O solution
- Expand as you develop
- Right sized for application

Reduce inventory
- One platform for Discrete and Hybrid space
- Productivity
- Improve time to market (TTM)

Compact size
- Reduced cabinet space
- No additional power supplies

Ease of integration
- Standard and safety (SIL 2) at the same list price
- Adaptive diagnostics

Connectivity
- 10/100/1000 Mbps
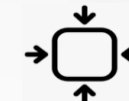- Dual IP, Device Level Ring (DLR), Star, Linear
- Cost savings

High performance
- Increased with fast screw-to-screw
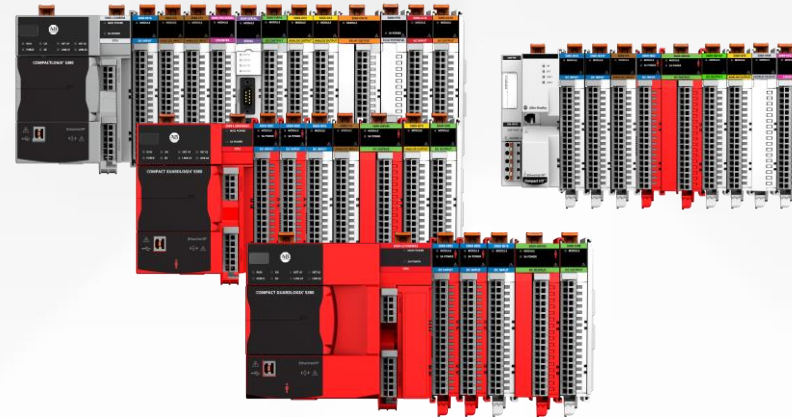- Up to 180 EtherNet/IP™ nodes
- Cost savings

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Success stories

Customer Success Story

- https://automation.klinkmann.com/references/ul-approved-automation-and-machine-safety-from-rockwell-for-finnsonic?hsLang=en

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UL-approved Automation and Machine Safety from Rockwell for FinnSonic

FinnSonic delivers FinnSonic Optima cleaning lines to its customer, with the control solution chosen being a versatile selection of Rockwell Automation PLC controllers provided by Klinkmann Automation with technical consulting and support.

AUTOMATION

FinnSonic is a technology company specializing in industrial parts cleaning and aviation non-destructive testing (NDT). Its products and systems are used in over 30 countries worldwide.

Rockwell Automation technology is extensively used in FinnSonic's system development and production. For controlling automatic NDT lines, they use servo motors and drives, frequency converters, PLC controllers as well as operator and mobile panels.

Rockwell's CompactLogix™ controllers and Compact GuardLogix® 5380 safety controllers offer modularity for lines of various sizes. Scaling solutions is easy and cost-effective, and the system also enables integrated safety and motion control without additional costs.

FinnSonic Optima cleaning lines can be customized to each specific application, with the line's scope ranging from a single manual unit to a fully automated, multi-stage line.

UL standards and machine safety influenced the choice

FinnSonic had several compelling reasons to choose Rockwell Automation's solutions. Many of FinnSonic's customers operate in the North American market, and Rockwell provides widely accepted solutions that meet the UL requirements needed there.

Klinkmann was already a familiar long time partner to FinnSonic for various products and related technical services.

- Rockwell is a strong and popular brand among global markets and especially customers in North America. Since Rockwell and its PLC controllers are well-known in the U.S., smoother maintenance, as well as local programming and project support are possible," says **Pasi Vähäkuopus**, Engineering Manager at FinnSonic.

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Klinkmann's solution:

Technical experts from Klinkmann Automation assisted in selecting the most suitable solution for the purpose, and they also provided training and guidance in system development.

- CompactLogix™ and Compact GuardLogix® Safety 5380 PLC controllers

- MobileView™ Tethered Operator Terminal allows the operator to move within the machine's operational area.

- PowerFlex® 525 AC Drives with built-in Ethernet and safety features.

- Kinetix® 5300 Servo Drives

- Kinetix® TL-Series™ servo motors

Read more about Rockwell solutions.

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Benefits for the customer:

- Easy and cost-effective scaling and adaptation of solutions

- Integrated safety and motion control without additional costs

- Fast application development and maintenance with Rockwell Studio 5000 project and programming platform. Ready-made libraries can be applied from one application to another.

- Approval and familiarity with the global incl. North American markets (UL requirements)

- Technical support from Klinkmann Automation, including UL training

- Machine safety