OEM segment application with SE solutions

Phongphun Pugdeeburus
Automation & Drive
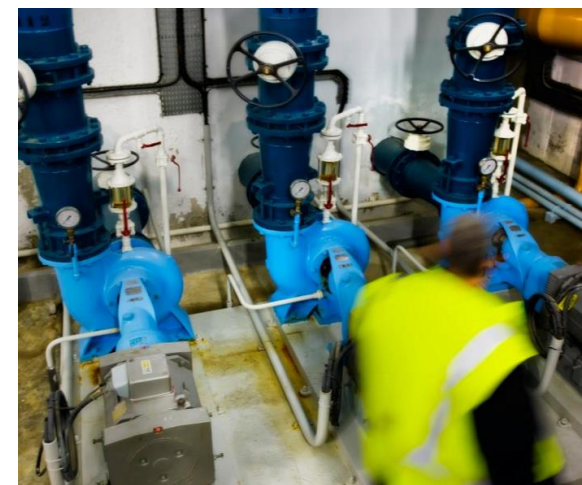Schneider(Thailand)

Life Is On | Schneider Electric

Agenda

Pumping application

Irrigation

Distribution, level control

Booster station

Sludge lift in wastewater

Dosing pumping

Pumped water

Life Is On | Schneider Electric

Centrifugal pumps

End-suction pumps: The impeller rotates in a casing called a volute. Liquid directed into the center, is picked up by the impeller and accelerated by the rotation, then it's discharged by the centrifugal force.

Split case pumps: A row of bolts allows one half of the case to be removed.

Multi-stage pumps: Several impellers mounted on the same shaft increases the pressure.

Turbine pumps consist of multiple stages to increase the pressure.

The shaft extends down the center of a large pipe. The water is pumped up this pipe.

Vertical turbine: Pump is underwater attached by a shaft to the motor mounted above the water.

Submersible turbine: motor is mounted underwater at the bottom.

Life Is On

Schneider Electric

Altivar Variable Speed Drives

Machine Drives
ATV320/ ATV340

Altivar Machine

Stay on top of the Smart Machine era

- Altivar Machine variable speed drives are designed to meet the needs of smart machines, and give OEMs the go-to choice for drives in simple and complex applications

Process Drives
ATV600/ATV900

Altivar Process

Is your drive IoT ready?

- Our variable-speed drive for industrial and utilities processes. Altivar Process enables more control of your energy management as well as enhanced process optimization and asset management

Building Drives
ATV212

Altivar Building

Orientated towards performance, intelligence and building protection.

- Dedicated variable speed drive for HVAC&R, ready for building management system and building protection

Drives Softwares

Setup, configuring & commissioning

- User-friendly setup software for motor control devices and one single software to program your entire machine

Life Is On | Schneider Electric

Controllers for Industrial Machines

Harmony SCU

HMI controller for small machine

All-in-one HMI BOX with control

- **Power supply**: 24V DC
- **Embedded inputs:** 12 to 16 D
- **Embedded outputs:** 6 to 16 T
- **I/O expansion:** Modicon TM2
- **Integrated functions:** 4 High speed counters, 4 PWM, display…
- **Communication**: 1 RJ45 port or 1 SUB-D 9 pin, Ethernet 1 port, CanOpen
- **EServices:** WEB server, Web gate

Modicon M221

For hardwired architectures

The best performance for its size!

- **Power supply**: 24V DC; 100/240V AC
- **Embedded inputs:** 8 to 24; 2 analog
- **Embedded outputs:** 8 to 16
- **I/O expansion:** Modicon TM3, TMC2
- **Integrated functions:** PID, 4 High speed counters, 2 positioning outputs
- **Communication**: 2 RJ45 ports, Ethernet 1 port
- **EServices:** SMS and emails

Modicon M241/M251

For simple motion control and distributed machines

Achieve benchmark performance

- **Power supply**: 24V DC; 100/240V AC
- **Embedded inputs:** 14 or 24 D **Embedded outputs:** 10 or 16 T, 4 transistor + up to 12 relay
- **I/O expansion:** Modicon TM3
- **Integrated functions:** PID, 8 High speed counters, 4 positioning outputs
- **Communication**: 1 RJ45 port, Ethernet 2 ports, CANopen master, Profibus DP
- **EServices:** WEB server, FTP server, FDR, I/O scanning…

Modicon M262

IIoT ready controller for Logic & Motion machines

High performance & flexibility!

- **Power supply**: 24V DC
- **Embedded I/O:** 4 fast DI , 4 fast DO
- **I/O expansion:** Modicon TM3, TM5, TM7
- **Integrated functions**: Touch probes, encoder, IIoT-Ready
- **Communication**: 2 Ethernet networks (EtherNet/IP, Modbus TCP and/or Sercos), 1 serial line, Mini-USB, Smart Communication Bus, TM3 bus, Optional: CANopen, up to 3 other Ethernet
- **EServices:** All in M241 + Machine Assistant, Encryption, IIoT functions,…

Life Is On | Schneider Electric

Tested Validated Documented Architectures (TVDA) for Booster

Single drive TVDA with multi lead for booster
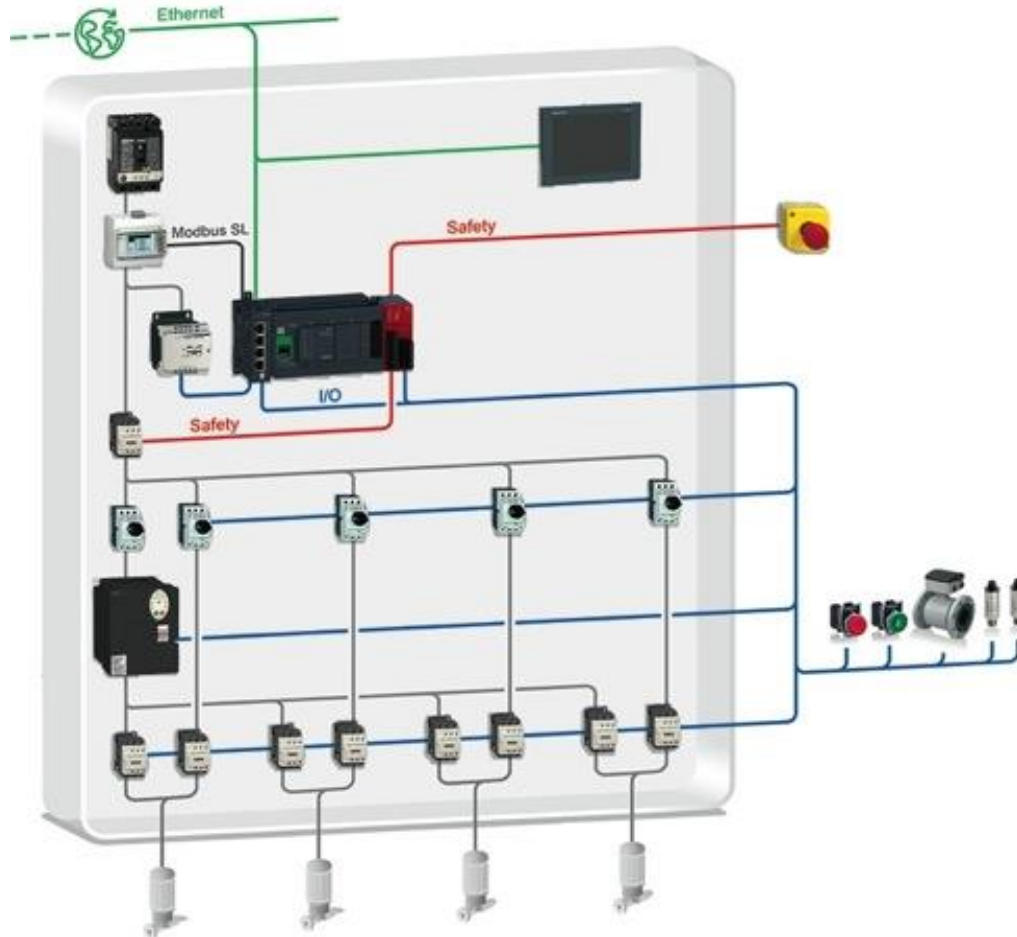
Booster Single Drive / Hardwired or
Modbus / Modicon M241 logic controller

- TVDA for standard boosters

- Single drive - single or multi lead mode

- One VSD to control multiple pumps

- Booster and pumps protection using AFBs embedded in controller

- Operates auxiliary pump to maintain lower flow requirement

- Reduced panel size

- Energy consumption optimized by switching the drive on multiple pumps

- Remote access through Web visualization

Life Is On | Schneider Electric

Nordic Clean Pumps

Energy efficiency and better productivity through remote monitoring of pump applications

Customer Challenges

Optimize pump applications using remote and secure connections to drives, in real time, to avoid inefficiencies, failures and downtime. Previously:

- Machines were neither connected remotely nor capable of remote connection
- Employees had to physically go to the site to access drives and pumps data
- No remote monitoring or digital services to the end user were available

The Solution

With the implementation of a full EcoStruxure Machine solution, including digital services, the drives can now be monitored at any time, from anywhere with a cybersecure connection.

Customer Benefits

- More efficient and faster maintenance & management of the pumps, with real-time notifications (alarms, errors, anomalies)
- Reduced downtime through faster advanced diagnostics and troubleshooting
- Less unexpected costs thanks to improved maintenance
- Real-time control
- Confidence in a strong cybersecure connection

The Results: Life Is On with…

energy savings up to **80%,** oxygen savings of **50%,** and increased **productivity** due to improved fish welfare

With almost **100 years** of experience delivering efficient pump solutions for the modern **aquaculture** industry

Eco truxure™ Machine

Apps, Analytics, & Services	EcoStruxure Secure Connect Advisor	EcoStruxure Machine Advisor
Edge Control	Harmony Edge Box	Modicon M262
Connected Products	Harmony HMI	Altivar Process drives

Life Is On | **Schneider Electric**

Kingsly Compression

Intelligent compression pumps save energy, time, and expense

Customer Challenges
- Remote monitoring of motors
- Data gathering on motor performance
- Variable control to cut energy costs

The Solution
- EcoStruxure Machine Expert programming software
- Modicon M262 PLC
- Altivar 320 variable frequency drives
- Harmony HMI

Customer Benefits
- Real-time data for more informed decisions
- Remote monitoring to limit downtime and speed up repairs

The Results: Life Is On with...

25% energy savings

"Improved remote monitoring, data gathering, and control have led to more than half of our customers switching from the traditional gas-driven engines."

**Kingsly Compression, Inc.,
Saxonburg, PA, USA**

Reducing the speed of the pump by as little as **10%** can result in a **25%** energy savings

Eco struxure™ Machine

Apps, Analytics, & Services	
Edge Control	• Modicon M262 PLC • EcoStruxure Machine Expert programming software
Connected Products	Altivar 320 variable frequency drives Harmony HMI
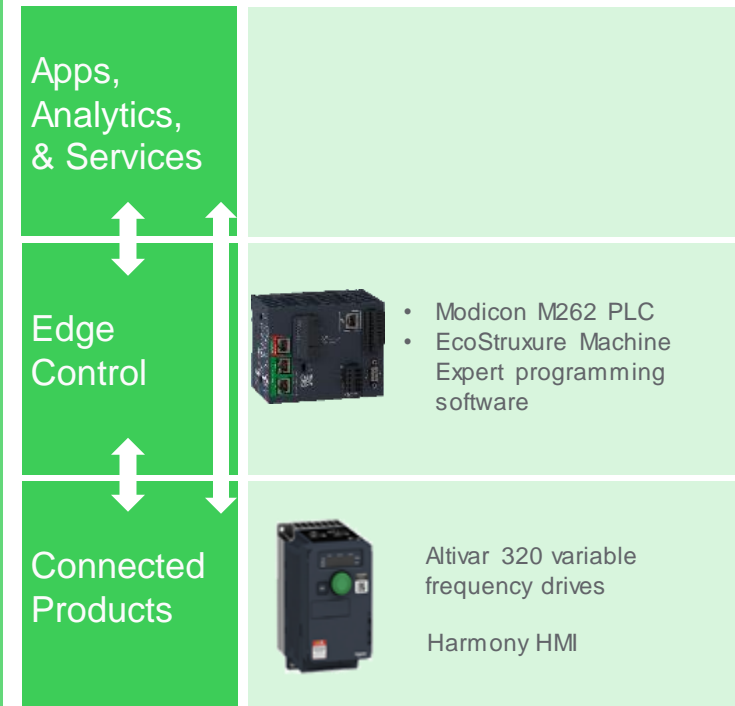
Life Is On | Schneider Electric

Wilo Indonesia

Premium digital automation solutions for dewatering pump systems

Customer Challenges

To replace the dewatering system at one of Indonesia's largest mining companies which did not function properly during a severe flood, Wilo needed a solution with:

- Less engineering time
- Remote monitoring capabilities to improve customer service
- Wireless remote monitoring in remote area
- Less energy consumption
- Global support

The end user needed a solution with:

- High reliability of remote monitoring, reporting, and control of the pump skid to prevent flooding
- Lower operating costs
- Enhanced safety

The Solution

Wilo (strategic OEM), together with Arsindo (pumping control panel builder), worked with Schneider Electric to design and deliver a full dewatering system to help prevent future flooding events. The EcoStruxure Machine solution includes digital services and leading-edge industrial software from AVEVA.
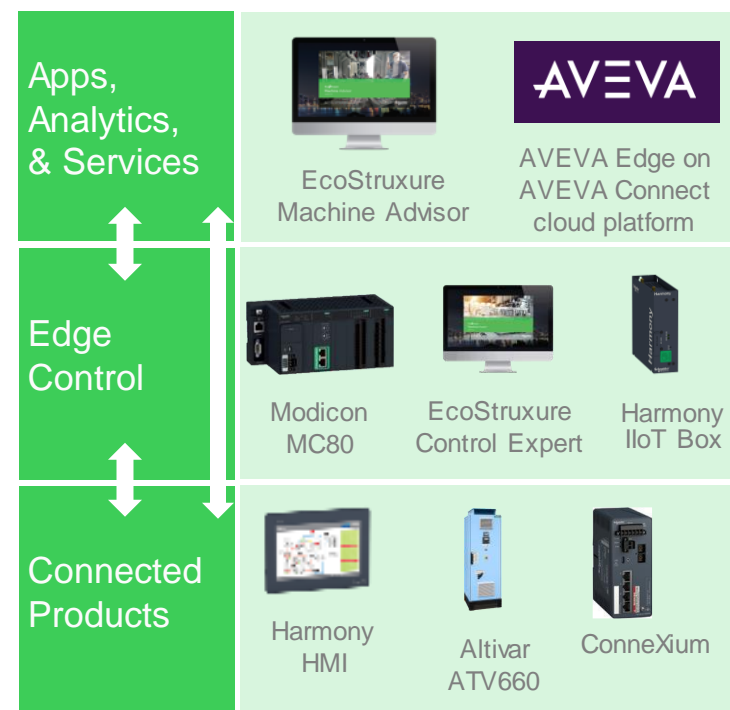
Customer Benefits

For end user:

- 20% reduction in energy consumption
- 25% less downtime through faster fault detection and resolution
- 40% reduction in labor costs: Only one operator per site/shift is now needed instead of four

For OEM:

- More efficient and sustainable machines
- Faster time-to-market
- Faster and easier engineering
- Facilitated new business model to remotely service end users

Video   PDF   HTML

One of the **world's leading** providers of **pumps** and pump systems for the building services, water management, and **industrial** sectors

EcoStruxure™ Machine

Apps, Analytics, & Services	EcoStruxure Machine Advisor	AVEVA Edge on AVEVA Connect cloud platform
Edge Control	Modicon MC80 / EcoStruxure Control Expert	Harmony IIoT Box
Connected Products	Harmony HMI / Altivar ATV660	ConneXium

AVEVA and the AVEVA logo are a trademark or registered trademark of AVEVA Group plc in the U.S. and other countries.

Life Is On | Schneider Electric

SmArt

EcoStruxure™ Machine

Empowering industrial OEMs for the digital era

Hoisting

Life Is On | Schneider Electric

OEM Solutions Portfolio Focus

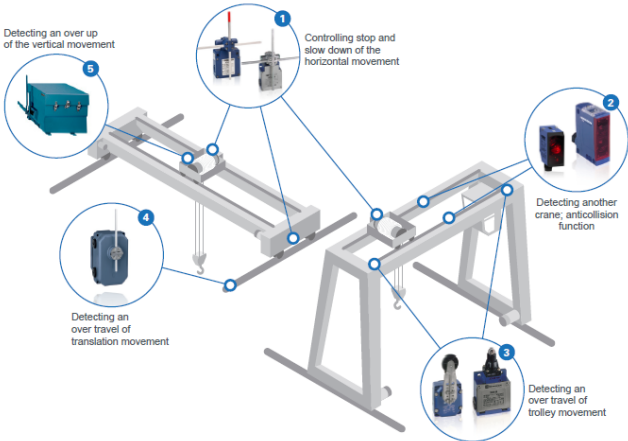**PLCs , PACs, Motion Controller Products**

Controllers for Industrial Machines

Controllers for Motion Centric Machines

HMI & IPC

Human Machine Interface

Local, remote, distributed

Modular Safety Controllers

Standard Cranes

Special Cranes

Tower Cranes

Harbor Cranes

Sensors for hoisting

Detecting an over up of the vertical movement

Controlling stop and slow down of the horizontal movement

Detecting another crane; anticollision function

Detecting an over travel of translation movement

Detecting an over travel of trolley movement

Control & Signaling

XB4 / Ø22

XB5 / Ø22

XAC

XKB

XVD

Sil3 Estop

XKD XKM

XVR13 Ø 130

XVS14

Variable Freq Drives & Motor control

LAD6T15, LAD6T63 or LAD6T63 red covers or contactors and relays

LAD6N229 mounting contact blocks

TeSys D Internal

Electrical protection & power supply

Compact

TeSys GV2

TeSys GV3

Schneider Electric
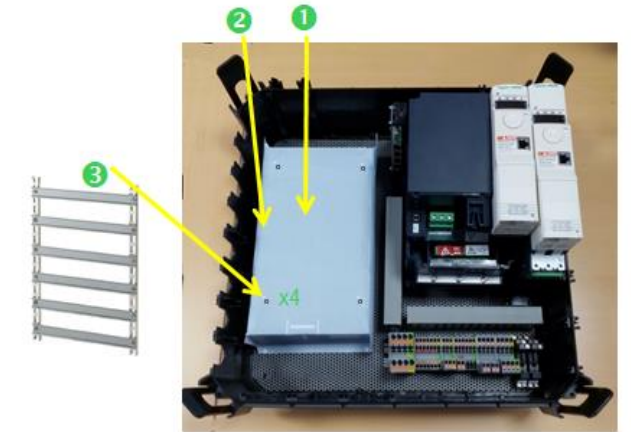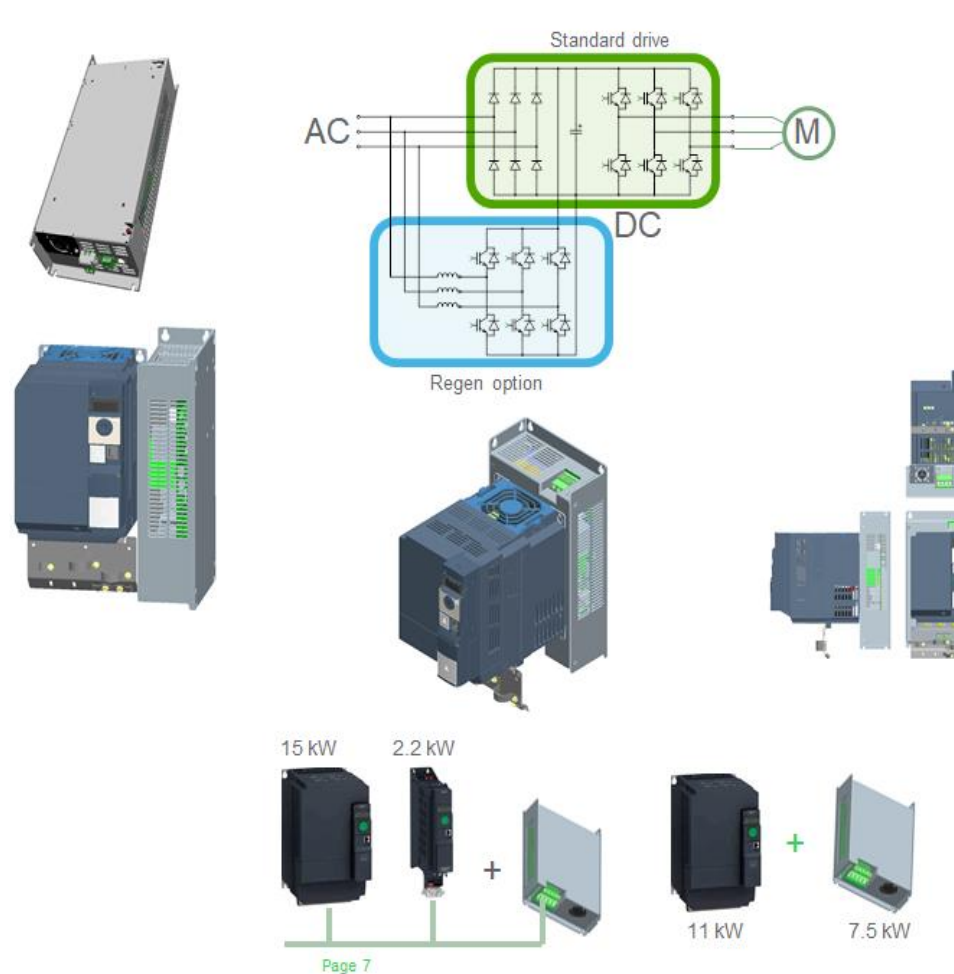
ATV REGEN Unit

- ✓ The regenerated power is sent to the power line network

- ✓ **Voltage/Power range:**
  380-500 V 3 Ph
  2 sizes 7,5 KW and
  15 KW … Up to 45 KW by connecting the units in parallel

- ✓ **No Setting**

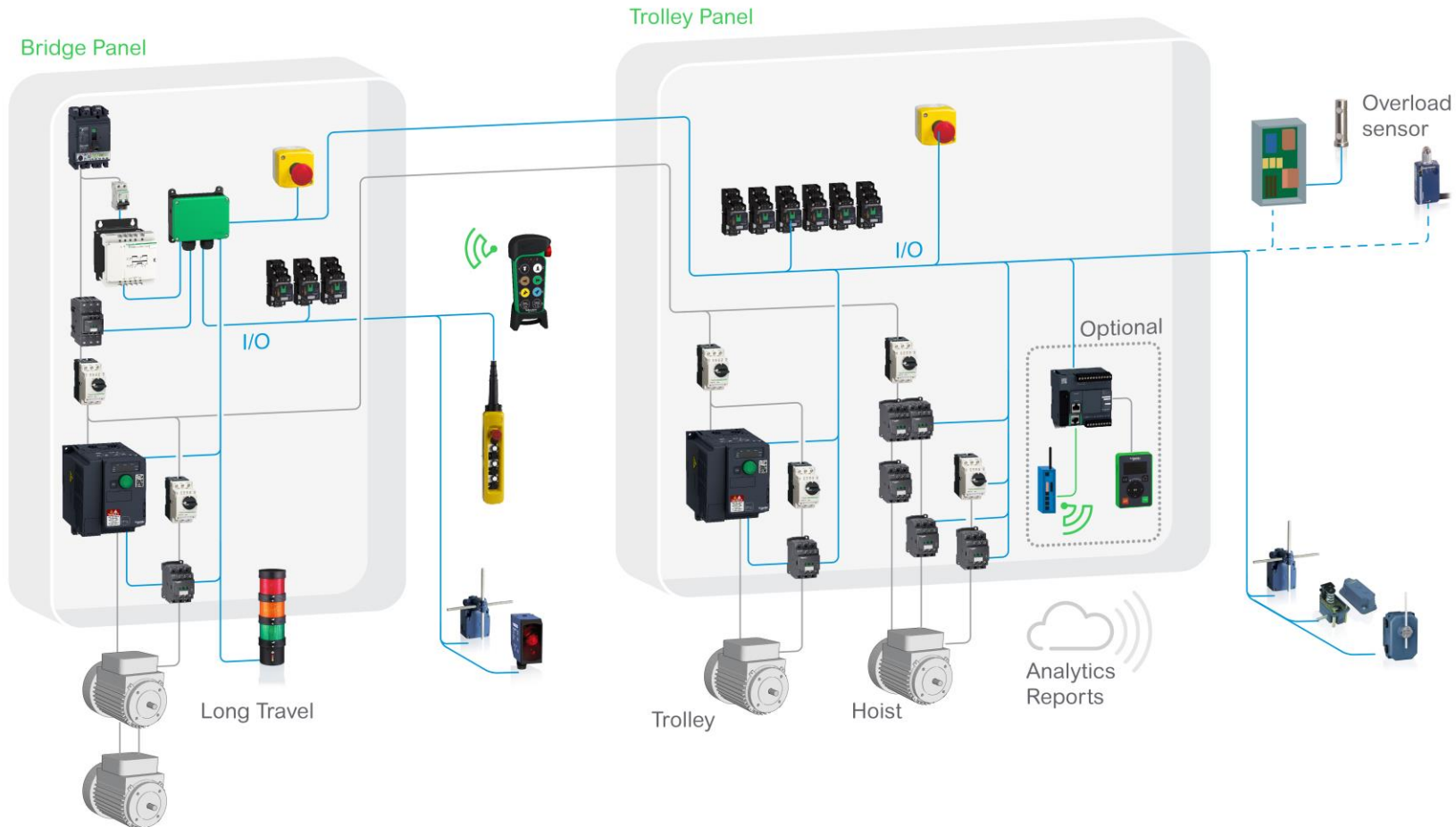- ✓ **Harsh environment:**
  3C3; 3S2 Up to 60°C with derating

Standard drive

AC — M

DC

Regen option

15 kW   2.2 kW

+

11 kW   7.5 kW

Page 7

Without PLC and terminals

Regen unit is under the PLC & customer components

With PLC and terminals

Life Is On | Schneider Electric

Architectures for standard machines

Overhead Cranes/Gantry cranes

Bridge Panel

Trolley Panel

Overload sensor

I/O

I/O

Optional

Long Travel

Trolley

Hoist

Analytics Reports

Life Is On | Schneider Electric

Hoisting library: description of function blocks

```
hoistingv4.2.0.0
  Hoisting
    Advanced positioning
    Anti-crab
    Anti-sway
    Diagnostic coverage
    Electronic potentiometer
    Grab control
    Hoisting position synchronization
    Limit switch management
    Load overspeed control
    Monitoring data storage
    Over load control
    Smooth slewing
    Speed optimization and rope slack
    Supporting function blocks
    Wind speed control
    _Legacy
```

Limiter function blocks

Limit Switch management

Manage the position limiters

Overload control

Machine overload management
Warning and Alarm

Load over speed

Machine over speed management
Alarm

Monitoring function blocks

Data Monitoring

Data Monitoring
- Manage Alarms historical.
- Manage the "Working safety period".
- Manage the tracking of usage of machines.

Hoist duty rating

The FB collects run time data and calculates the actual mechanical class corresponding to the usage.

Application function blocks

Anti sway 2 Open loop

Sway control:
Operator assistance to avoid dangerous load sway

Hoisting synchronization 2

Position self correction between 2 horizontal or vertical axis

Speed optimization and rope slack

Capability to use the motor in overspeed up to the nominal motor power value

Embedded inside "EcoStruxure Machine Expert" programming software

Life Is On | Schneider Electric

FMGru

Building cranes digital by design

Customer Challenges

- Differentiate in the market using advanced technology
- Geolocation of cranes & operational work areas
- Monitor working conditions
- Provide continuity of service
- Faster start-up time
- Improve maintenance operations
- Ensure proper use of cranes to protect condition of assets and reduce customer disputes

The Solution

FMGru selected a complete EcoStruxure Machine solution, including digital services. EcoStruxure Machine Advisor allows FMGru to remotely monitor the status of the cranes, facilitates maintenance and operations, and easily interfaces with third-party management systems via the API.

Customer Benefits

- Reduction in warranty disputes over the misuse of cranes through visibility into load weight and crane use
- Improved management and maintenance, using precise operating data and alarms in daily reports
- Less machine downtime through remote support
- Reduction and monitoring of costs with EcoStruxure Machine Advisor
- Competitive advantage through greater technological differentiation
- Increase in long-term service contracts, either directly or through dealers
- Ability to identify the optimum systems required based on data analysis of location, climate, and operating conditions
- Improved overall customer satisfaction
- Increased spare parts business

Video

A **global** leader in the manufacture of tower cranes, using **innovative** technologies to address the needs of **modern** job sites

EcoStruxure™ Machine

Apps, Analytics, & Services	EcoStruxure Machine Advisor
Edge Control	Modicon M251 & M241 — EcoStruxure Machine Expert
Connected Products	Altivar Machine 320 & 340 variable speed drives — Harmony HMI

Life Is On | Schneider Electric
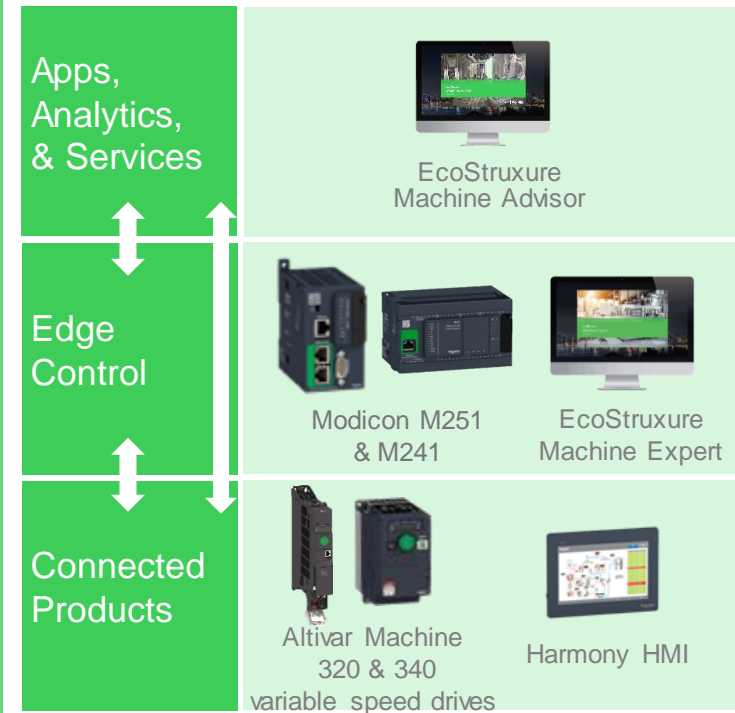
ABUS Crane Systems

Intelligent solution for modular, standard cranes

Customer Challenges
- Numerous requirements for highly complex and customized crane systems
- Need to standardize modules to achieve shortest production time possible
- Ability to operate quickly and independent of time zones and location by leveraging advancements like digital data processing for preventive maintenance and repair

The Solution
- Schneider Electric's Hoisting expertise
- EcoStruxure™ Machine, which has the breadth of portfolio to address all their customers' needs
- Collaboration at all stages: drafting requirements, concept development, proposing innovative solutions with new functionalities and features, programming, testing, validation
- The result is ABUControl, an intelligent modular crane control system based on EcoStruxure™ Machine. All required crane functions can be implemented with just two standard modules - from simple to complex crane architectures, with several cranes and hoists

Customer Benefits
- Faster crane production by implementing all required crane functions using only two standard modules
- Faster response to customer needs through faster and more flexible new development
- Ease of use and safety
- Higher crane availability - reduced downtime
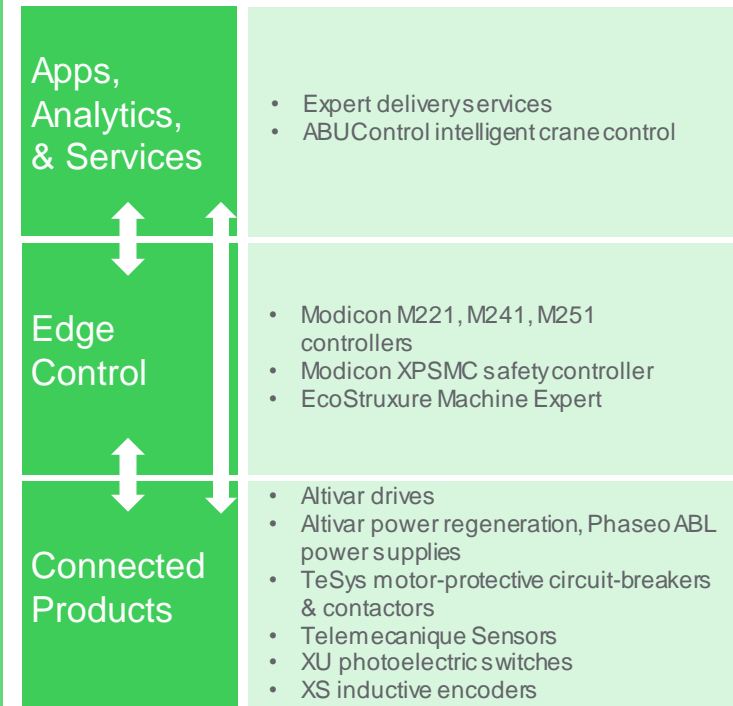- Energy savings of up to 40%

The Results: Life Is On with…
faster delivery, and energy savings of up to **40%**

Video link
HTML link

One of the leading manufacturers of crane systems in Europe, ABUS builds more than **5,000 cranes** a year, supplies more than **35,000** customers in Germany, and exports to **55** countries around the globe

EcoStruxure™ Machine

Apps, Analytics, & Services	• Expert delivery services • ABUControl intelligent crane control
Edge Control	• Modicon M221, M241, M251 controllers • Modicon XPSMC safety controller • EcoStruxure Machine Expert
Connected Products	• Altivar drives • Altivar power regeneration, Phaseo ABL power supplies • TeSys motor-protective circuit-breakers & contactors • Telemecanique Sensors • XU photoelectric switches • XS inductive encoders

Life Is On | Schneider Electric

Alla public company

Hoisting and crane

Customer Challenge

- Customer was looking for a solution to meet extensive challenges of :
  - Reducing Time for Installation and competitive pricing
  - Increasing reliability and quality of new Drive application.

The Solution

- Reduce enclosure sizing with energy efficiency purposed by ATV930 and ATV Regenerative unit

- Easy for integration of Hoisting system. Thanks to SoMachine Software with Hoisting Library

Benefits

- With SoMachine software from Schneider Electric, Alla PLC has improved their Engineering time, cost saving.

- In addition, ATV Regenerative unit can help them to optimize enclosure sizing, save installation space and energy efficiency purposed

A leader in the manufacture of standard cranes, using **innovative** technologies to address the needs of **modern** job sites

Eco truxure
Innovation At Every Level

Apps, analytics, and services	None
Edge control	PLC :M241
Connected products	Altivar 340 , ATV Regen

Life Is On | Schneider Electric

EcoStruxure™ Machine HVAC

Empowering industrial OEMs for the digital era

Life Is On | **Schneider Electric**

Ecostruxure Machine -HVAC

EcoStruxure™ Architecture

Apps, Analytics & Services

EcoStruxure Machine Advisor

EcoStruxure Building Operation

EcoStruxure Augmented Operator Advisor

EcoStruxure™ Facility Expert

EcoStruxure™ Building Expert

End-to-end Cybersecurity

Cloud and/or On Premise

M171-72_62420_ CPSCT17016

EcoStruxure Machine Expert – HVAC

Modicon HVAC Controls

Connected Products

Magelis

Valves & Sensors

Energy Meter

Remote displays

Tesys

Altivar

Life Is On | Schneider Electric

Ecostruxure Machine Expert -HVAC

Graphics and textual languages

- Fully graphics
- Multilanguage
- Automatic documentation

WebVisu embedded

- Web pages creation
- Fully customizable
- Can be used with PC, tablet or smartphone

Simulation tool

- HMI and I/O Emulation; IEC Code; Live Debug
- Triggers; Oscilloscope

Life Is On | Schneider Electric

Internal
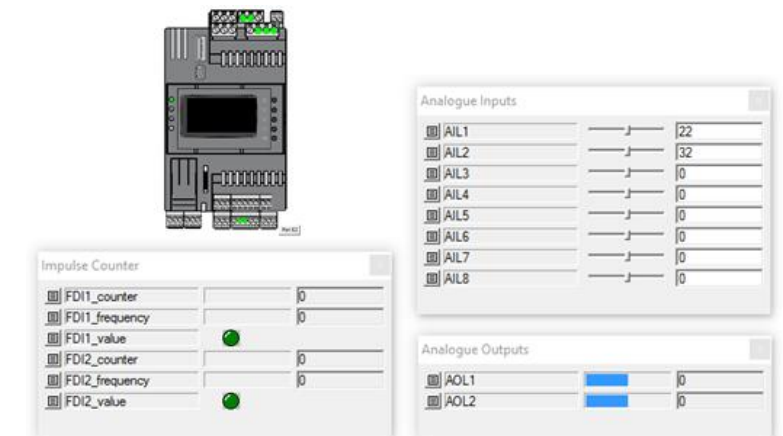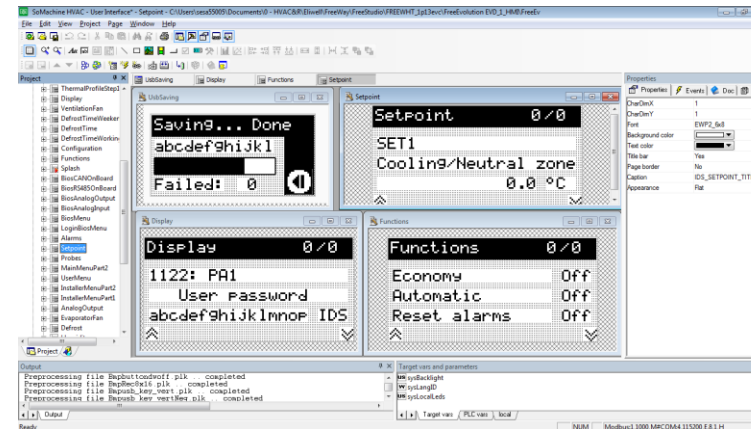
TVDAs for air handling units (AHU)
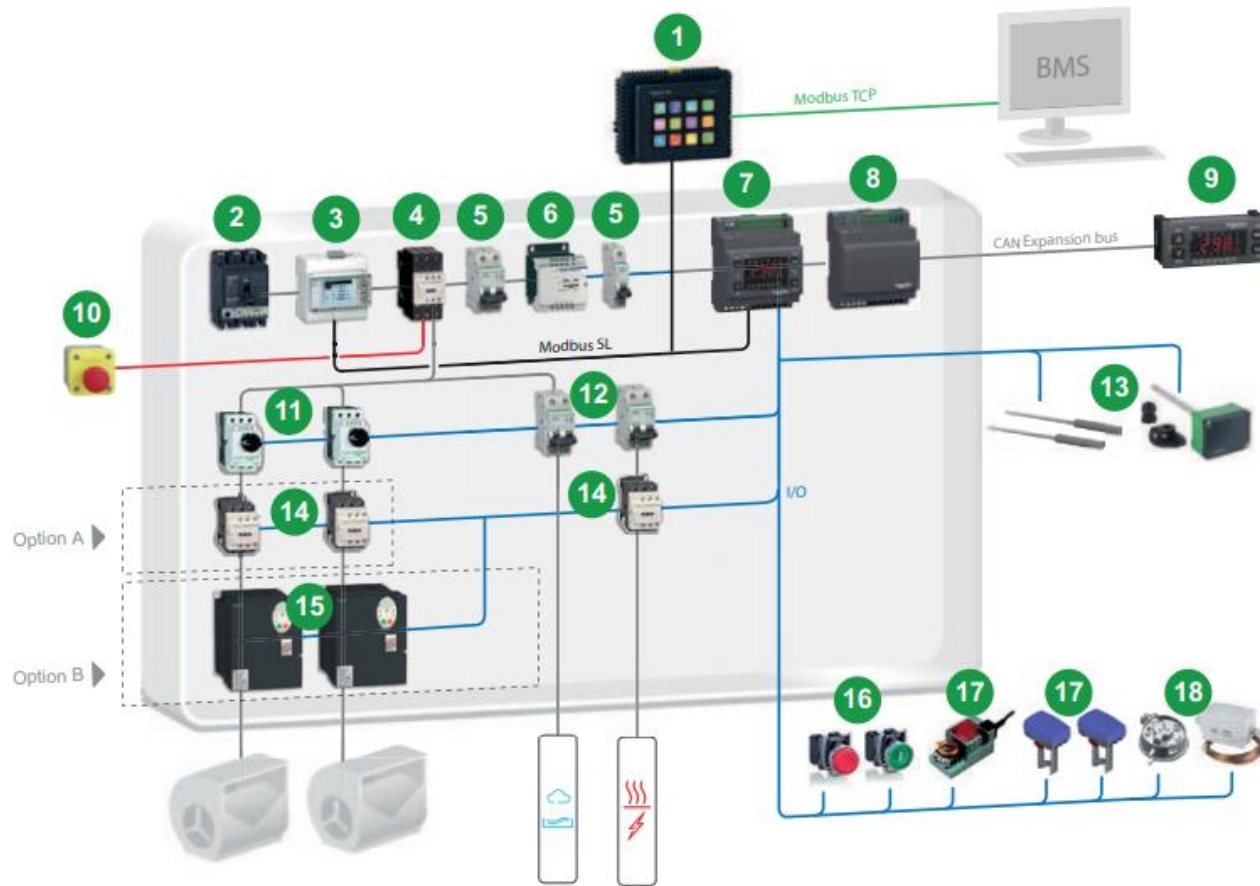
Temperature control by actuators:

- Fans, heating and cooling coils, dampers

Humidity control:

- Humidifier, dehumidifier through cooling coil and post-heater

- Automatic/Manual heat/cool changeover

Energy efficiency optimization:

- Calculation of differential temperature between return and outdoor air

Heat recovery wheel modulation

- Calculation of differential temperature associated to relative humidity between return and outdoor air

Internal

HVAC library

Application library for AHU (air handling unit):

1. Plant mode control
2. AHU temperature control
3. Drive communication control
4. PID with auto-tuning
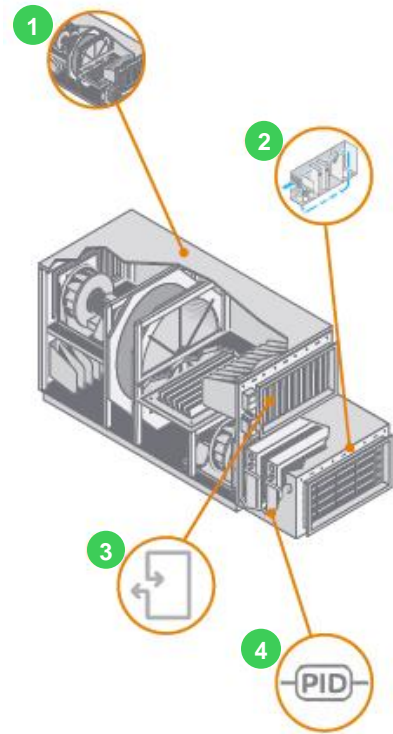
Application Function Blocks available in SoMachineHVAC software for AHU

Application library for chiller:

1. Fan management
2. Floating high-pressure control with or without variable speed drives
3. Compressor management with or without variable speed drives
4. Drive communication control
5. Energy management (COP* monitor)
6. PID with auto-tuning
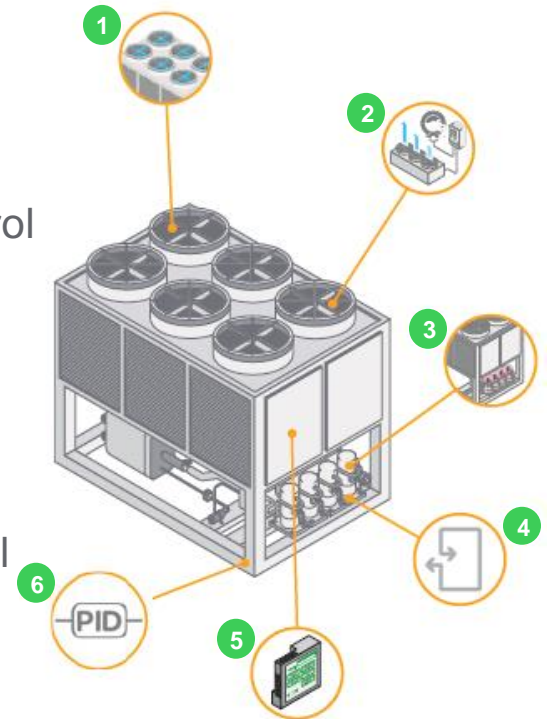
Application Function Blocks available in SoMachineHVAC software for chiller

Life Is On | Schneider Electric

HVAC controllers for commercial machines

EcoStruxure™ Machine Expert - HVAC

EcoStruxure™ Machine Expert - HVAC

Modicon M171/172

For HVAC control solutions

Best-in-class for scalability and energy efficiency

- **Modicon M171 optimized** logic controller for simple and compact machines
- **Modicon M172 optimized** logic controller for compact and BMS connectable machines
- **Modicon M172 performance** logic controller for large and connected machines with more scalability and connectivity.
- **Communication:** Modbus SL, Modbus TCP, BACnet MS/TP, BACnet/IP, CAN, Profibus, ASCII, LonWorks

Expansion Modules and Displays

I/O expansion, Communication, touch screen color displays

Step into the M172 catalogue

- **I/O expansion:** 14 to 28 discrete or analog I/O extension modules
- **Expansion Valve Driver Module:** to control electronic expansion valves
- **Communication additional modules:** Modbus, LonWorks, Ethernet
- **Displays with integrated temperature sensor:** 7 segments, LCD screen, Color touchscreen
- **One software platform:** EcoStruxure Machine Expert HVAC

Life Is On | Schneider Electric

Internal

Oxford Energy Solutions Inc.

Sustainable refrigeration solutions

Customer Challenges

As an OEM, Oxford Energy needed to help their customers to:

- Modernize 50-year-old systems
- Eliminate need for lubrication in refrigeration components
- Improve visibility into operating thresholds of each system
- Increase flexibility, reliability & functionality
- Reduce maintenance & repair costs

The Solution

Based on previous experience with Schneider Electric and the companies' shared values around energy resilience and sustainability, Oxford Energy chose to implement a full suite of EcoStruxure Machine solutions so it could provide its customers with more efficient refrigeration systems.

Customer Benefits

- 50%-70%+ cut in energy requirements (from 21 Kw/h to 6 Kw/h) for refrigeration systems
- Improved equipment reliability and lifecycle
- Drastically reduced operating and maintenance costs for end users
- Remote monitoring & predictive maintenance capabilities

The Results: Life Is On with...
50%-70% less energy requirements

HTML

PDF

Designing & building **refrigeration** equipment for agricultural, food processing, industrial, health care, and water quality/control customers in Canada & the USA since 2006

EcoStruxure™ Machine

Apps, Analytics, & Services	EcoStruxure Machine Advisor	EcoStruxure Secure Connect Advisor
Edge Control	Modicon M172	EcoStruxure Machine SCADA Expert
Connected Products	Altivar Machine ATV320	• Power supplies • Switches • Harmony pushbuttons • Contactors • TeSys U motor starters • Motors • Transducers • Telemecanique sensors
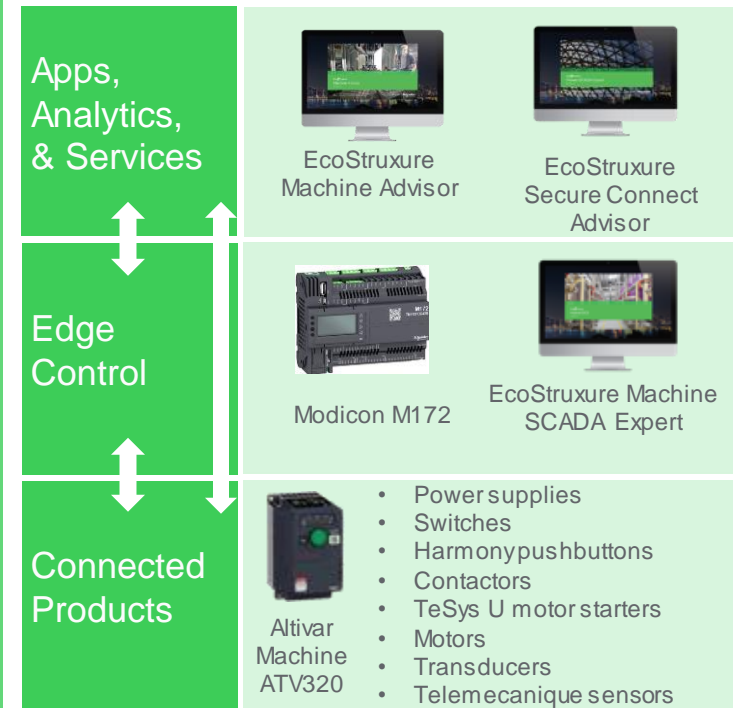
Life Is On | Schneider Electric

NIT Korea Co. Ltd.

Better customer service through remote monitoring

Customer Challenges

For their industrial grade dust collection system, NIT Korea was looking for:

- Remote monitoring capabilities to improve customer service
- Turnkey solution from a single vendor
- Compliance with government environmental policy

The Solution

NIT Korea selected a complete EcoStruxure Machine solution, including digital services and power products, with the support of Alliance Machine Integrator partner, ENES. This solution is based on the flexibility of EcoStruxure Machine Expert HVAC and Basic and is monitored in the cloud via EcoStruxure Machine Advisor.

Customer Benefits

- 20% cost savings in initial investment and workforce requirements
- Increased operational efficiency
- Facilitated new business model to remotely service end users
- Single vendor for solution & functionalities that met all the customer's needs
- Full engineering and efficient 24/7 technical support during the project stages, from designing to programming and panel building

The Results: Life Is On with…

20% cost savings & NEW business model

"Thanks to Schneider Electric's EcoStruxure Machine, we could create a new service business model, especially with EcoStruxure Machine Advisor. We trust Schneider Electric as our partner because of their expertise and integrated EcoStruxure solutions that help us leverage the latest IIoT technologies."

**HYUNG KEUN JEON,
General Manager, NIT Korea**

HTML
PDF

Leading producer of air pollution **reduction** systems, specialized in integrated industrial electrostatic precipitators (ESP)

EcoStruxure™ Machine

Apps, Analytics, & Services	EcoStruxure Machine Advisor
Edge Control	Modicon M172 — EcoStruxure Machine Expert (Basic & HVAC)
Connected Products	Harmony HMI — Altivar 212 — EasyLogic meters — EasyPact circuit breakers — EasyPact contactors — Osmart circuit breakers
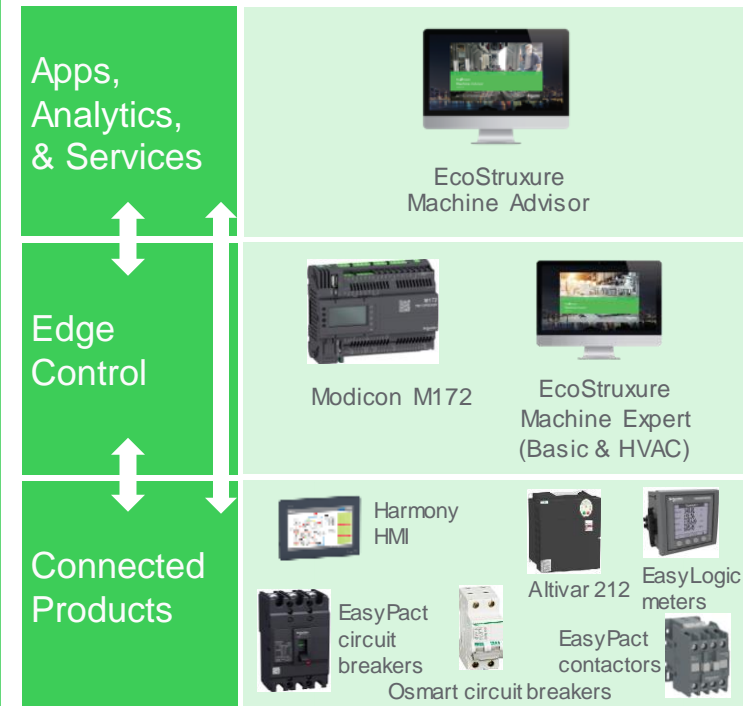
Life Is On | Schneider Electric

Schneider Electric proposal for Packaging lines

Life Is On | Schneider Electric

End User needs impacting Packaging machinery

Higher Productivity

- Line Availability Maximization
- Ensure Nominal Production Speed
- Quality Loss Minimization

Need of Flexibility

- More often changes in Packaging types
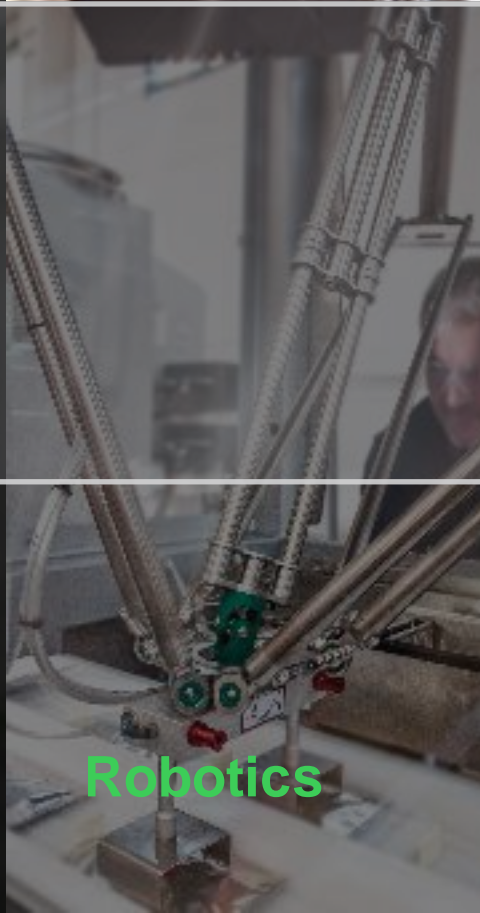- Faster Time-to-market

More Sustainability

- Waste minimization
- More fragile packaging
- New materials
- Circular economy (digital mark)

Machine TCO Reduction

- Footprint optimization
- Decrease of Operation Cost
- Decrease of Maintenance Cost
- Machine-as-a-Service

Impact of major technologies in Packaging machinery performance

Robotics   **Digitization**   **multi carrier**

A proven combination bringing 40% faster machine integration
30% reduced time-to-market
50% time savings for corrective actions

Schneider Electric value proposition for Packaging machinery

Increase in performance and flexibility

- Leap in flexibility, larger variety of products can be run on the same machine
- Availability to produce up to x3 times more compared to previous machines version
- Complete transparency with Aveva World (System Platform, Batch Management, Recipe Manager plus)

Lexium MC12
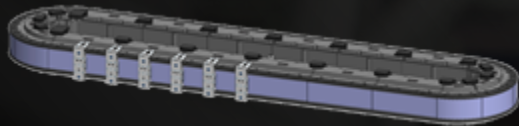
More sustainability, full tracking & transparency

- Easier adaptation to packaging material variance, less waste
- End-to-end traceability & transparency ready

AVEVA

Machine TCO reduction

- Overall machine footprint reduction (up to 30%)
- Shorten Machine downtime (up to 50%)
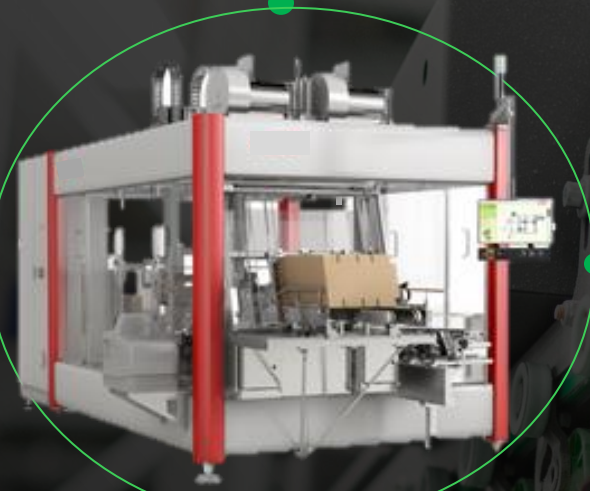
Lexium Robotics

Advisors

EcoStruxure™ Secure Connect

Empower the workforce with digital tools

- Operational efficiency improvement with faster maintenance tasks
- Simplify the implementation skills development , knowledge sharing and collaboration management (Teamwork)

Example of Packaging line management

Line visualization

Line services

Line Orchestration

Plant Control room
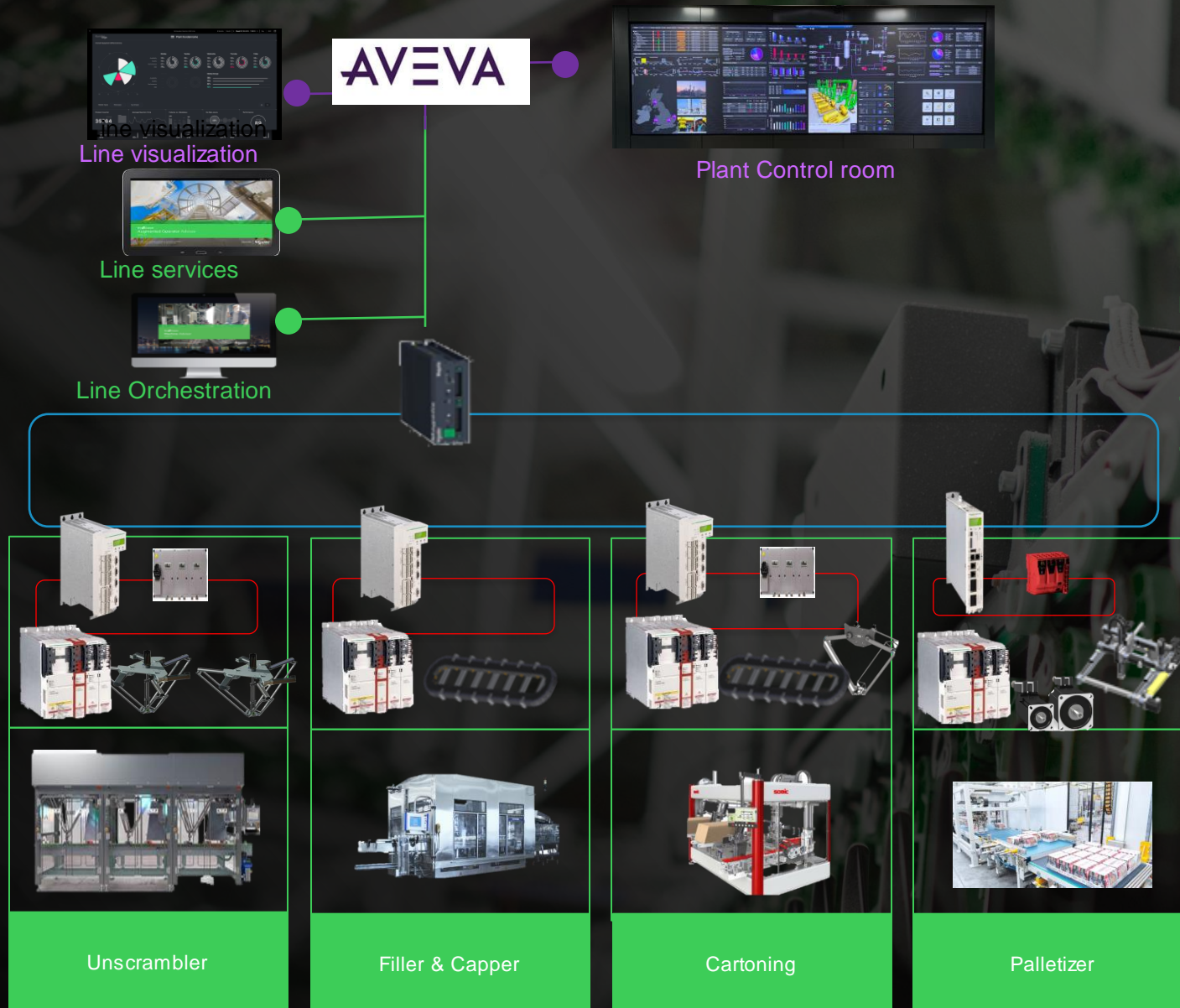
- Scalable automation platform
(same controller for automation, robotics, multicarrier)
- IT/OT integration
- Line visualization and services
- Connectivity with Aveva upper layer plant system

Unscrambler

Filler & Capper

Cartoning

Palletizer

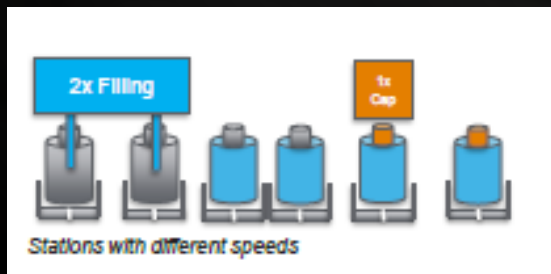# How Lexium MC12 multi carrier can help to improve your manufacturing flexibility?

They are key for machine performance

They drive machine architecture

Transportation systems are a central part of a machine

They can simplify process stations by taking over part of the function

They can add flexibility for handling different products
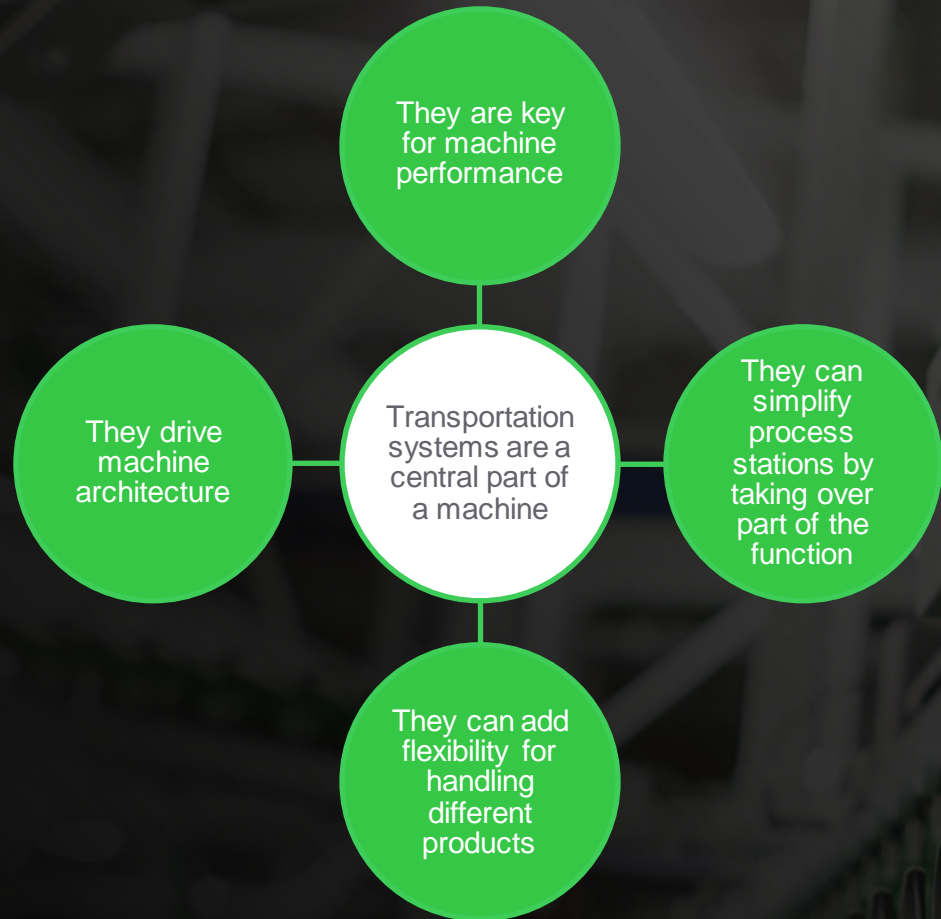
Transport systems are a central part of a machine

Transport system interfaces with all process stations

Functions of Lexium MC12 multi carrier

Products transport solution for moving, positioning or grouping objects in machines for discrete processes.

Solution with Multi-carrier	Grouping	Stacking	Pick and place	Free movements
• Less stations as bottles move faster through capping than filling station • Smaller gaps between products outside stations • Clamping for different bottle diameters • Less stations (cost savings) • More compact • Faster and simplified format change	• Products can be loaded on the fly • Pocket size can be adjusted to adapt to formats or to simplify loading • Products move individually, high performance, increasing group size does not impact performance • Buffer between loading and unloading station can compensate jitter in product flow • Flexible grouping patterns • Space reduction: Min. length: 1x product group length + product length	• Pocket "grows" with products put into pocket • Different products from different infeed stations can be stacked into same pocket • Grouping of stacked products • Products can be pushed together	• More picks per min, products can be picked more often in robot sweet spot by slower speeds in working envelope and higher speeds during transfer (to next robot) • Better Accuracy, no belt slipping • Bypasses and line balancing with track switches	• A carrier can be moved freely throughout the track. It can brake, accelerate, position or exert a constant force when stationary or also in motion. Like any linear motor, the carrier can synchronize on other movements. When arranged in a circle, the carriers move endlessly following the flow of product. • Several carriers can all be moved independently of each other. They can be positioned at absolute positions over the entire distance traveled. In addition, they can be moved relative to each other and always avoid a collision with their neighbor. They can regroup automatically.

Stations with different speeds

Grouping

Stacking and Grouping

Variable Speed of carrier

Digitize the production of your line with EcoStruxure Machinery Expert Twin

- Simulate your production before having your machine physically
- Perform virtual commissioning
- Remote production viewer with Digital Twin

Orion Machinery Co. Ltd.

Faster changeover times and 50% less space

Customer Challenges

- Reduce machine size to accommodate customers with limited space.
- Develop a flexible machine to reduce changeover times for small quantities and various types of products
- Increase revenue and develop new business opportunities targeting customers in the consumer packaged goods industry by using cutting-edge technologies

The Solution

Orion Machinery selected a full EcoStruxure Machine solution, including digital services, the new Lexium MC12 multi carrier controlled by the PacDrive LMC controller, and EcoStruxure Machine Expert Twin software.

Customer Benefits

- 50% less space needed, providing flexibility and increased productivity for end users with space limitations
- Instant changeover time which increases production flexibility and results in faster product delivery to market
- Fast digital twin simulation helps to convince its end users to choose to implement the MC12

The Results: Life Is On with…

50% smaller machines & ZERO changeover time

Leading manufacturer of packaging machines for personal paper products like tissues and diapers, using **cutting-edge** technology

Eco**truxure**™ Machine

Apps, Analytics, & Services	EcoStruxure Machine Advisor
Edge Control	PacDrive 3 LMC motion controller / EcoStruxure Machine Expert / EcoStruxure Machine Expert Twin
Connected Products	Lexium MC12 multi carrier

Life Is On | Schneider Electric
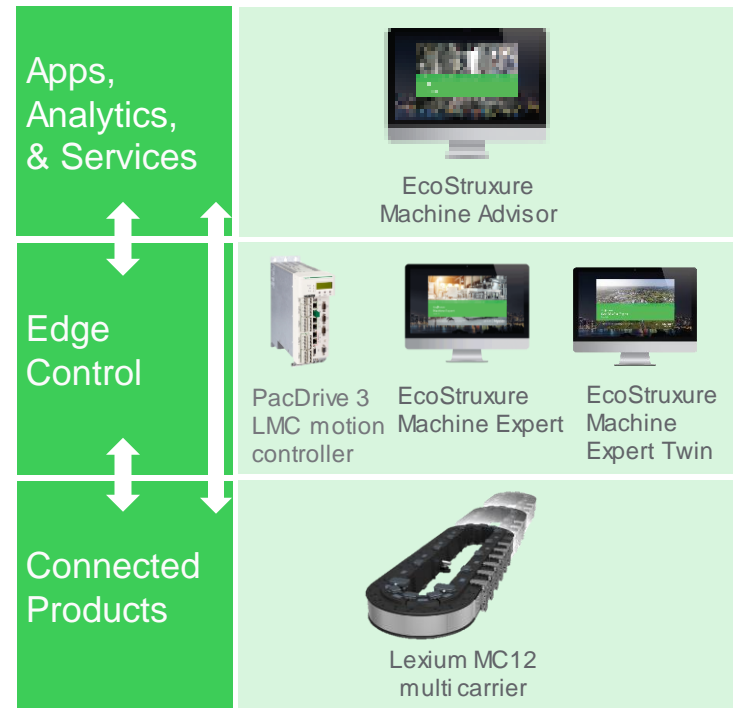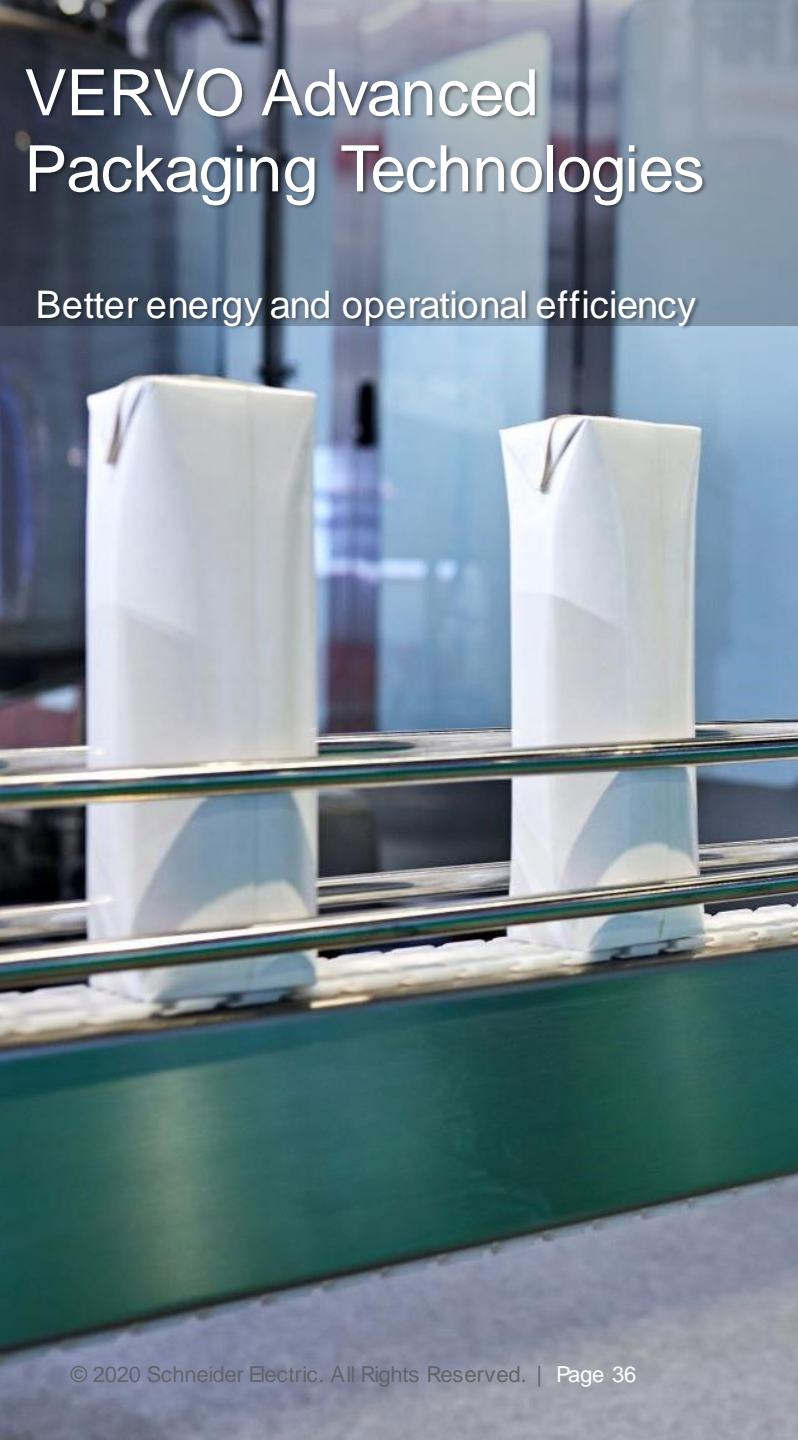
VERVO Advanced Packaging Technologies

Better energy and operational efficiency

Customer Challenges

- Improve energy efficiency
- Increase remote control and monitoring
- Easy integration
- Strengthen differentiation from the competition
- Improve commisioning time and service efficiency

The Solution

VERVO has been collaborating with Schneider Electric for over five years and selected a full EcoStruxure Machine solution, including digital services and robotics, for its machines and systems.

Customer Benefits

- 40% improvement in energy efficiency
- 20% increase in production capacity
- Tailor-made solution for its specific market
- Reduced machine downtime and maintenance using augmented reality and real-time information
- Reduced commisioning time and faster time-to-market
- Lower costs
- Continuous optimization during operation with remote management and control

The Results: Life Is On with...

40% increase in energy efficiency & **2x** operational efficiency

Video

Innovative solutions for secondary **packaging** and end-of-line **automation systems** for companies in the food services, chemicals, cosmetics, and fast-moving consumer goods industries

EcoStruxure™ Machine

Apps, Analytics, & Services	EcoStruxure Augmented Operator Advisor	EcoStruxure Secure Connect Advisor	EcoStruxure Machine Advisor
Edge Control	PacDrive 3 LMC802 motion controller		
Connected Products	Lexium Delta 3 P4 robots	Altivar Machine drives / Lexium LXM 62 drives	
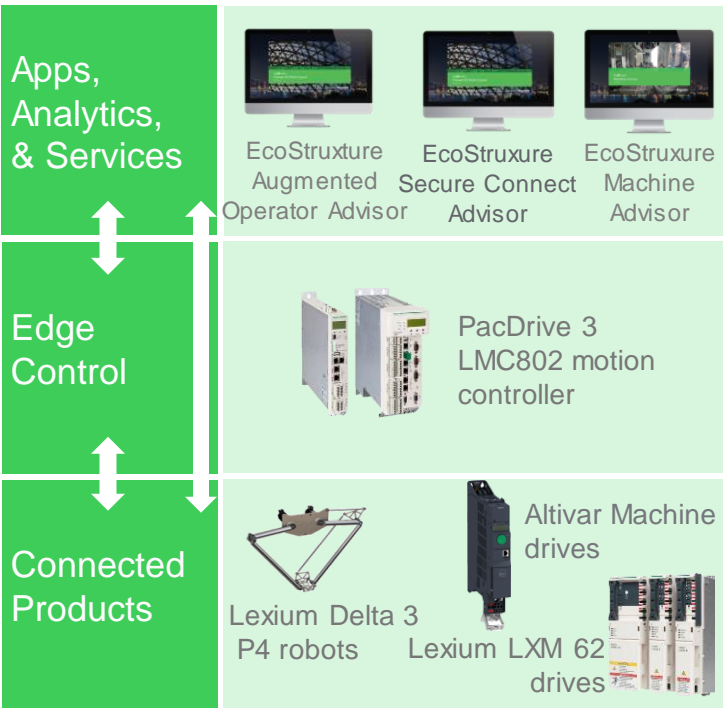
Life Is On | Schneider Electric

Livetech S.R.L.

High-performance digital solution

Customer Challenges
- Reduce changeover time
- Faster time-to-market for mechatronic module-machines
- Optimize energy consumption
- Reduce footprint

The Solution
For their compact, energy-efficient E-series monoblock cartoning machines, Livetech chose an EcoStruxure Machine solution, including the next-generation Lexium MC12 Multi-Carrier system which provides a new level of ease for integration and operations.

Customer Benefits
- 30-40% cost savings
- 50% faster changeover time
- Easier maintenance with high performance, digital solution
- Strong worldwide service and support
- Faster, modular machines with smaller footprint
- Embedded cybersecurity

The Results: Life Is On with...
up to **40%** cost savings & **50%** faster changeover time

[Video](#)

Building **high-performance** & **environment-friendly** machine systems for packaging, palletizing, and chocolate moulding for leading multinational customers in the food industry.

EcoStruxure™ Machine
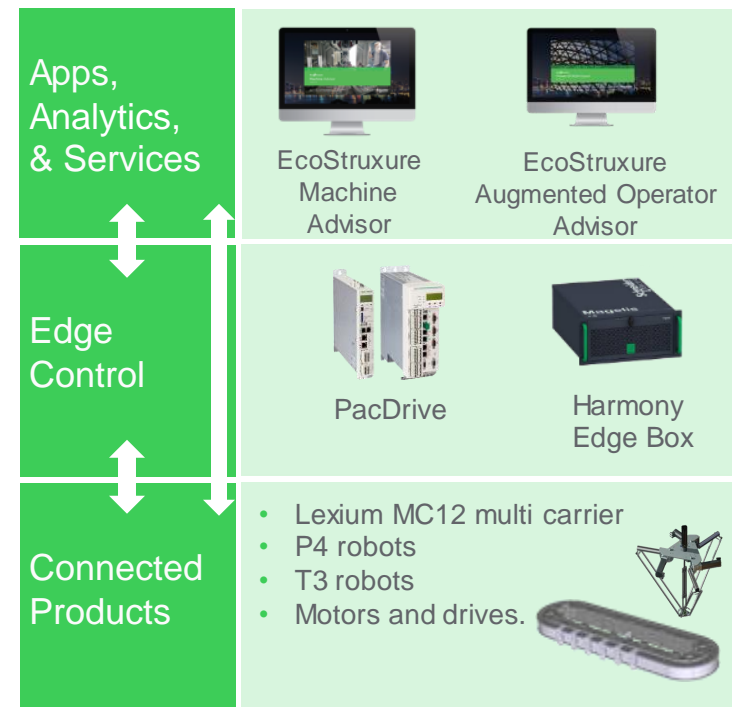
Apps, Analytics, & Services	EcoStruxure Machine Advisor / EcoStruxure Augmented Operator Advisor
Edge Control	PacDrive / Harmony Edge Box
Connected Products	• Lexium MC12 multi carrier • P4 robots • T3 robots • Motors and drives.

Life Is On | Schneider Electric

Lexium MC12 multi carrier

Next generation of transport system with unprecedented simplicity in installation and commissioning

Presented by: Presenter's Name

Life Is On | Schneider Electric

Consequences on machines design

End users

- Do microsegmentation and increasing promotional activities to keep market share and margins
- Need to react quickly to changing demands having effect on packaging, e.g. green products, healthy, increasing online sales

As a consequence, **OEMs** need to

- Provide more flexible machines
- Deliver machines with a shorter lead time

"Food processors are looking to OEMs to deliver greater automation, machine flexibility for materials, sizes and shapes, standardized communication platforms, quick changeover, longer pasting parts, and faster serviceable machines"*

Source: Packaging world

Life Is On | Schneider Electric

How Lexium MC12 multi carrier can help to improve your manufacturing flexibility?

They are key for machine performance

They drive machine architecture

Transportation systems are a central part of a machine

They can simplify process stations by taking over part of the function

They can add flexibility for handling different products

Transport systems are a central part of a machine

Transport system interfaces with all process stations

Life Is On | Schneider Electric
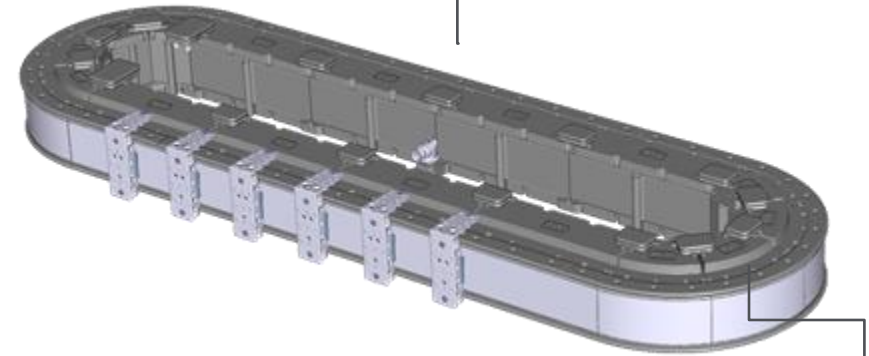
CPG Industry trends that will influence the global packaging industry

E-commerce and faster delivery

Customization

Ever-increasing health focus

Green growth

Global CPG Industry trends

Next-generation design and procurement

Intelligent supply chain

Back-office automation

Agile budgeting and resource allocation

Evolving CPG industry operating model to succeed*

"The CPG industry is entering a new era... Tomorrow's supply chain must operate in real time and with insufficient information to enable cost reduction, resilience, flexibility, and traceability."*

Mc Kinsey & Company

Source: What got us here won't get us there: A new model for the consumer goods industry

Life Is On | Schneider Electric

Internal
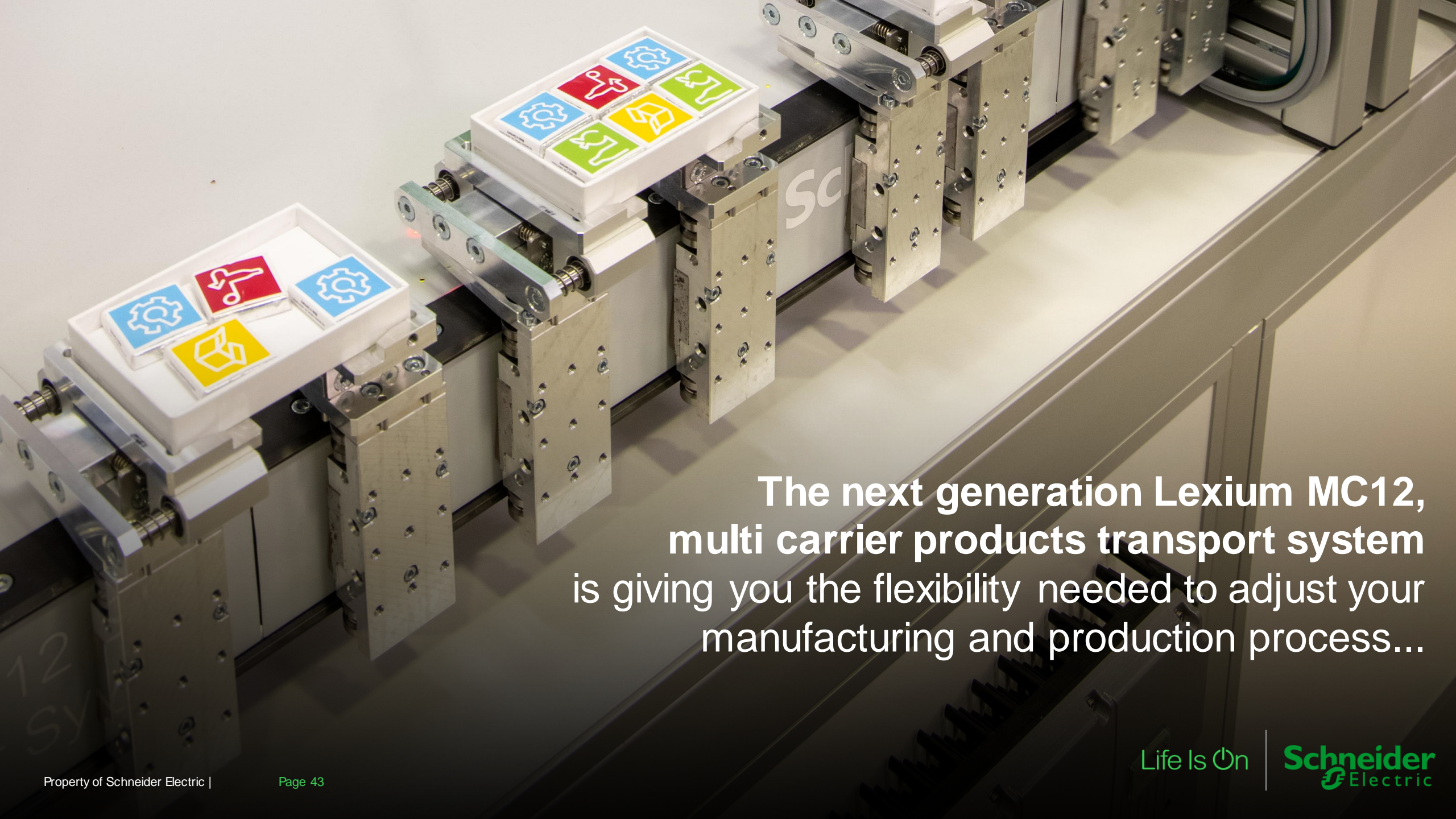
The next generation Lexium MC12, multi carrier products transport system is giving you the flexibility needed to adjust your manufacturing and production process...

Life Is On | Schneider Electric

Lexium MC12 multi carrier

- For transporting, grouping and positioning products are opening up a completely new era for packaging, assembly and other machines

- Carriers are moving independently from each other on track systems with individual velocity, placing or grouping products at the right time at the right position in discrete machine processes and offering a new degree of flexibility.

Life Is On

Schneider Electric

Functions of Lexium MC12 multi carrier

Products transport solution for moving, positioning or grouping objects in machines for discrete processes.

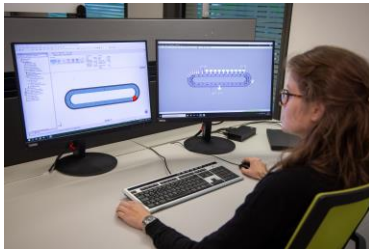| Solution with Multi-carrier	Grouping	Stacking	Pick and place	Free movements
• Less stations as bottles move faster through capping than filling station • Smaller gaps between products outside stations • Clamping for different bottle diameters • Less stations (cost savings) • More compact • Faster and simplified format change	• Products can be loaded on the fly • Pocket size can be adjusted to adapt to formats or to simplify loading • Products move individually, high performance, increasing group size does not impact performance • Buffer between loading and unloading station can compensate jitter in product flow • Flexible grouping patterns • Space reduction: Min. length: 1x product group length + product length	• Pocket "grows" with products put into pocket • Different products from different infeed stations can be stacked into same pocket • Grouping of stacked products • Products can be pushed together	• More picks per min, products can be picked more often in robot sweet spot by slower speeds in working envelope and higher speeds during transfer (to next robot) • Better Accuracy, no belt slipping • Bypasses and line balancing with track switches	• A carrier can be moved freely throughout the track. It can brake, accelerate, position or exert a constant force when stationary or also in motion. Like any linear motor, the carrier can synchronize on other movements. When arranged in a circle, the carriers move endlessly following the flow of product. • Several carriers can all be moved independently of each other. They can be positioned at absolute positions over the entire distance traveled. In addition, they can be moved relative to each other and always avoid a collision with their neighbor. They can regroup automatically.

Stations with different speeds

Grouping

Stacking and Grouping

Variable Speed of carrier

Life Is On | Schneider Electric

Internal

Lexium MC12 multi carrier value propositions

Boosting productivity and flexibility

Faster machine integration and maintenance

Reducing design and time to market

Achieving sustainable manufacturing

1 Increase performance and flexibility

2 Simplified installation and commissioning

3 Differentiate in machine design

4 Increasing OEE of machines

- Carriers are moving independently on track systems
- Placing or grouping products at the right time at the right position

- Easy integration into EcoStruxure Machine solution for remote monitoring and predictive maintenance
- Format change on the fly with seamless camming adjustment and application libraries
- Automatic configuration after replacement of segments or carriers
- Easy mounting/demounting of segments and carriers with less wiring

- Proven single engineering tool for configuration, programming logic, motion, robotics and multi carrier
- Simulation tool for testing and commissioning with a digital twin of the machine
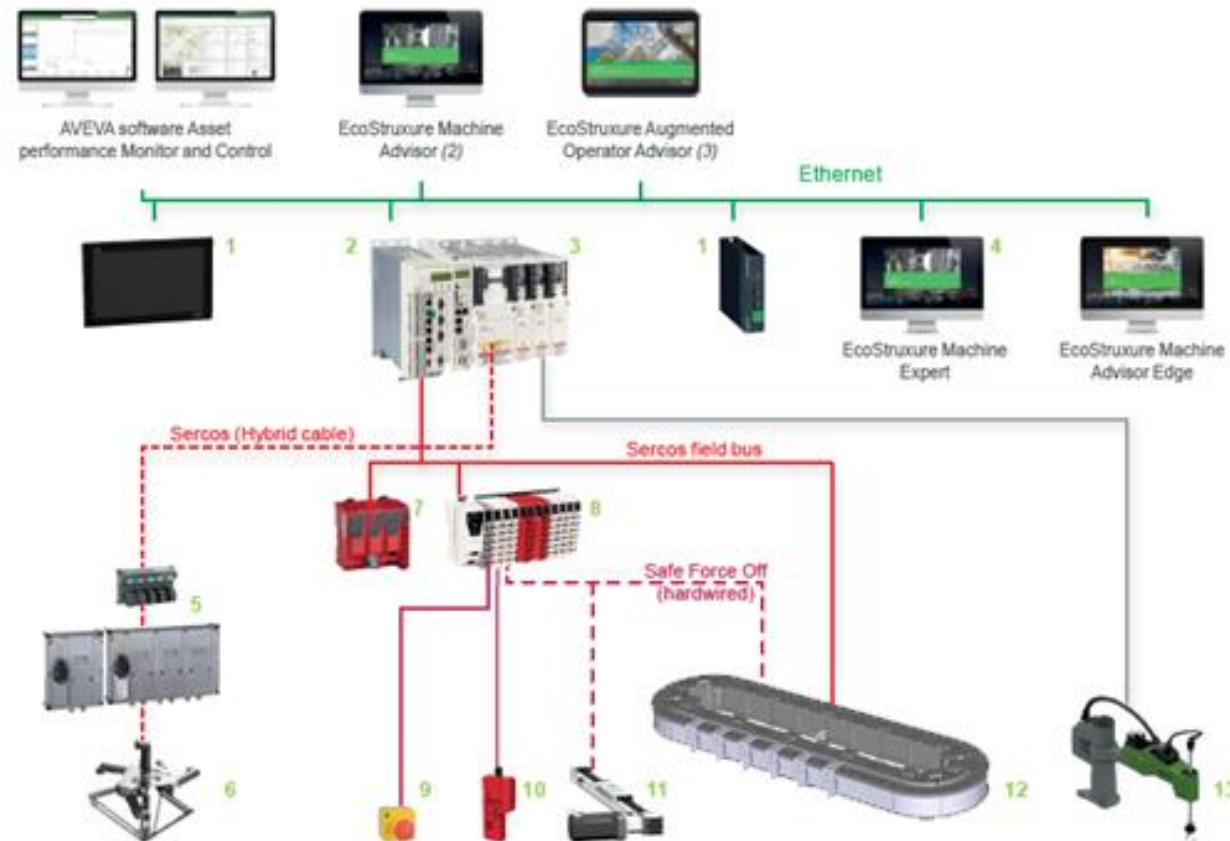- Smaller footprint and less cost of the multi carrier machine compared to belt machines

- Less maintenance using long-lasting steel components
- Higher level of diagnostic for reduced unplanned downtime
- Different product formats can be placed on the same machine

Life Is On | Schneider Electric
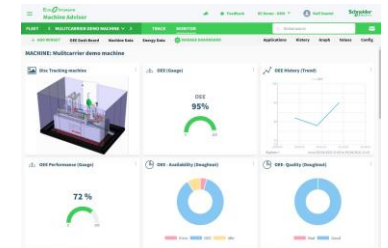
A complete automation solution for motion-centric machines

Lexium MC12 multi carrier is integrated into PacDrive 3 system

AVEVA software Asset performance Monitor and Control

EcoStruxure Machine Advisor (2)

EcoStruxure Augmented Operator Advisor (3)

Ethernet

EcoStruxure Machine Expert

EcoStruxure Machine Advisor Edge

Sercos (Hybrid cable)

Sercos field bus

Safe Force Off (hardwired)

1. Harmony iPC panel, Harmony Edge box
2. PacDrive LMC Eco/Pro/Pro2: Motion controller for automating machines/lines with 0 - 130 servo or robot axes
3. Lexium 62 Multi axis servo drive and power and servo motors, Lexium 62 ILM: integrated servo drives
4. EcoStruxure Machine Expert: configuration software
5. Lexium 62 ILD detached servo drives: single drive, triple drive
6. Lexium P: Delta 3 robots for pick & place solutions
7. Modicon TM5CSLC: Safety logic controller
8. Modicon TM5: Sercos interface module, safety IO expansion module, and IO expansion module (IP 20)
9. Harmony Harmony XALD, XALK Plastic control stations using Harmony XB5 Emergency stop pushbuttons
10. Telemecanique XCSR contactless RFID safety switches
11. Lexium PAS: portal axes with fixed axis body
12. Lexium MC12 multi carrier
13. Lexium STS: SCARA robot for positioning solutions

Life Is On | Schneider Electric

Lexium Cobot

Collaborative Robots

Presented by: Pongchat Boonyapat

Life Is On | Schneider Electric

Agility in an environment of labour and raw material shortages

Industry trends

Demand for customization

Survey of 1,000 US adults found **80%** of respondents want personalization of products they buy [1]

If a company gets it wrong, **customers** may **depart** for a competitor

Raw materials in short supply

Supply chain resilience now at its highest risk classification. High risks across almost all sectors and geographies [2]

Procurement 'C' Level sees digital transformation to **reimagine** their **entire operations** and how they perform [3]

Where are the workers?

According to an EIU survey, more than **60%** of respondents said "talent shortages are likely to affect their bottom line", especially in the highly skilled talent pool. [5]

54% of employers say they can't find qualified applicants for open positions. [5]

Digitization can help

30% of operations could reduce TCO with smart machines and industrialized services [4]

During 2014–2024, 50% of work by US workers could be **automated** to some extent. [5]

Digital technologies can reduce time to market by **30%** [6]

Sources:
(1) Personalizing the customer experience: Driving differentiation in retail. April 28, 2020 - McKinsey
(2) Achilles Supply Chain Resilience Index - 2022 Q2 report
(3) Ardent Partners – Procurement 2022 - Big trends and predictions.
(4) Deloitte, "Beyond the Noise: The Megatrends of Tomorrow's World", 2017
(5) Deloitte 2016, US Chamber of Commerce 2014, Monster.de 2015
(6) CIMData ROI Study "The Benefits of Digital Manufacturing,"

Life Is On | Schneider Electric

Market dynamics/ challenges accelerate demand for new technologies

Challenges

Business challenges have shifted from **demand constraints** to **supply constraints** and **rising material costs**

In many markets it's hard to find qualified workers and raw materials while customer and market demands change more rapidly than ever

Meeting these challenges while operating with lower capital budgets than ever before requires increased **Agility**

New technologies

Robotics and automation are now more affordable and within the economic reach of mid-market manufacturing.

Collaborative robots or **Cobots**, are designed to work with people and are a key element to meet these market challenges.

Life Is On | Schneider Electric

What You Can Automate Using Just One Cobot

Automation challenges

Pick and place
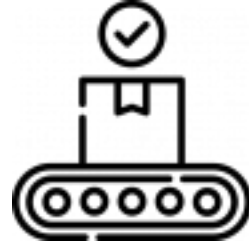
Packaging

Inspection & Mobile
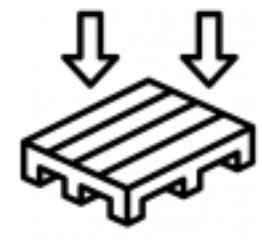
Palletizing

Painting & spraying
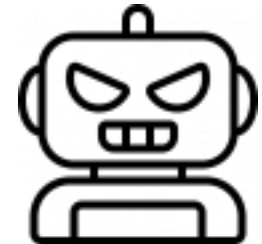
Assembly

Sorting

And more!

Life Is On | Schneider Electric

Lexium Collaborative Robot

Lexium Cobot (Collaborative Robot) is a highly efficient, advanced robotic system with the technology required to perform complex tasks effortlessly. It is easy to setup and simple to integrate into complete robotics systems with multi carrier, delta robots etc.

Lexium Cobot includes safety systems and certifications that other robots don't have. Once an appropriate risk assessment is performed and understood it can collaborate with people to accomplish a wide range of tasks.

Lexium Cobot frees up workers to bring more value in tasks that machines can't perform.

Life Is On | Schneider Electric

Lexium Cobot

Recover investment costs faster when modernizing facilities

① **Increase performance and flexibility**

- Perform high precision tasks
- Designed to work with people
- Extra safety built in
- Reduced risk of injury

② **Saves long term cost**

- Easily integrated with existing production
- Fast and easy to deploy
- Integrated with EcoStruxure Machine Expert machine

③ **Easy integration and fast deployment**

- Low cost of ownership
- Reduced cost of programming and setup
- Easily integrated into existing machine and production systems
- Highly efficient
- Helps companies recover investment costs faster

Lexium Cobot Range

Fully integrated robotic systems - digitally designed from concept to operation

	Lexium RL 3	Lexium RL 5	Lexium RL 7	Lexium RL 12	Lexium RL 18
Payload	3 kg	5 kg	7 kg	12 kg	18 kg
Weight	12 kg	23 kg	22 kg	41 kg	35 kg
Operating radius	626 mm	954 mm	819 mm	1327 mm	1073 mm
IP Class	54	54	54	54	54

Life Is On | Schneider Electric

Lexium Cobot Controllers

+ AC supply (100-240 V)
+ Stand-alone design
+ High-speed input (for belt tracking)

+ DC supply (30-60V)
+ Panel mount
+ Small and compact size

Cobot Controller	
IP Level	IP44
Tool I/O	16 Digital input and output/ 2 Analog input or output
I/O Voltage	24V
Interface	TCP/IP, Modbus TCP, Modbus RTU ProfiNet, EthernetIP
Input Power	100-240VAC,50-60Hz
Size	410×307×235 (mm) (W×H×D)
Weight	12kg (RL03,RL05, RL07) 16kg (RL12, RL18)
Material	Stainless steel

Compact Controller *2	
Voltage in	DC30~60V
I out	≤40A
Tool I/O	7 Digital I/O (configurable) 24V DC
Interface	TCP/IP, Modbus TCP, Modbus RTU ProfiNet, EthernetIP
IP Level	IP20
Form Factor	Panel mount
Size	180×128×47 (mm) (L×W×H)
Weight	1.1kg
Material	Aluminum / Steel

Joint 5
Joint 4
Joint 6
Joint 3
Joint 2
Joint 1

Life Is On | Schneider Electric
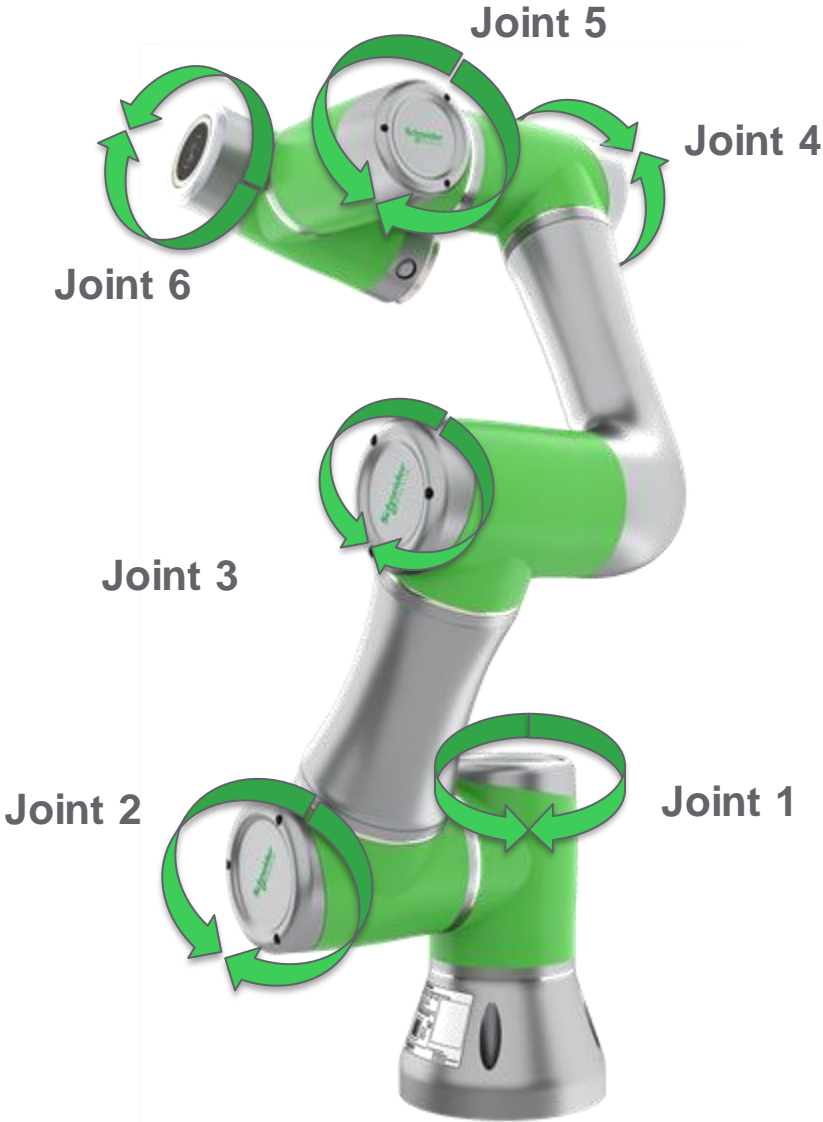
Lexium Cobots Update

Objective Q3

from 5 to 18kg Payload

Lexium RL 5

Lexium RL 7

Lexium RL 12

Lexium RL 18

Life Is On | Schneider Electric

Lexium Cobot

Fully integrated robotic systems - digitally designed from concept to operation

- Easy to integrate Cobots into industrial systems

- Support workers to reach their full potential and deliver optimal results.

- Schneider Electric Cobots are compatible with **EcoStruxure Machine Expert Twin, our digital twin solution**.

- Systems can be designed and tested virtually before real-world implementation even takes place

Life Is On | Schneider Electric

Flexible machine integration

Integration to an existing machine/line

End- user approach

- AC supply (100-240 V)
- Stand-alone design
- High-speed input
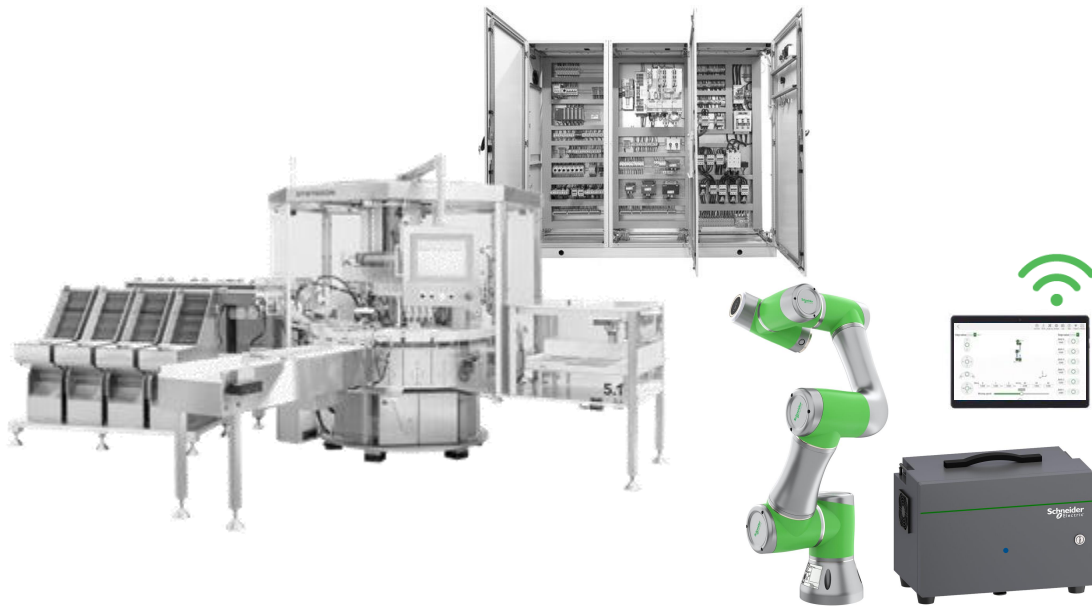
Integration to a new designed machine

OEM approach

- DC supply (30-60V)
- Panel mount
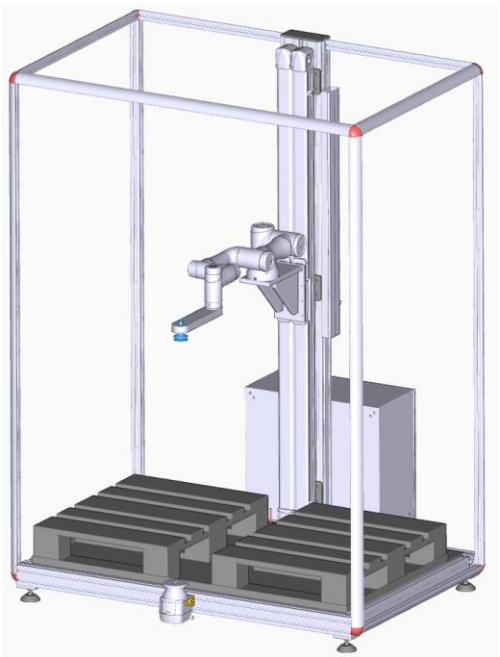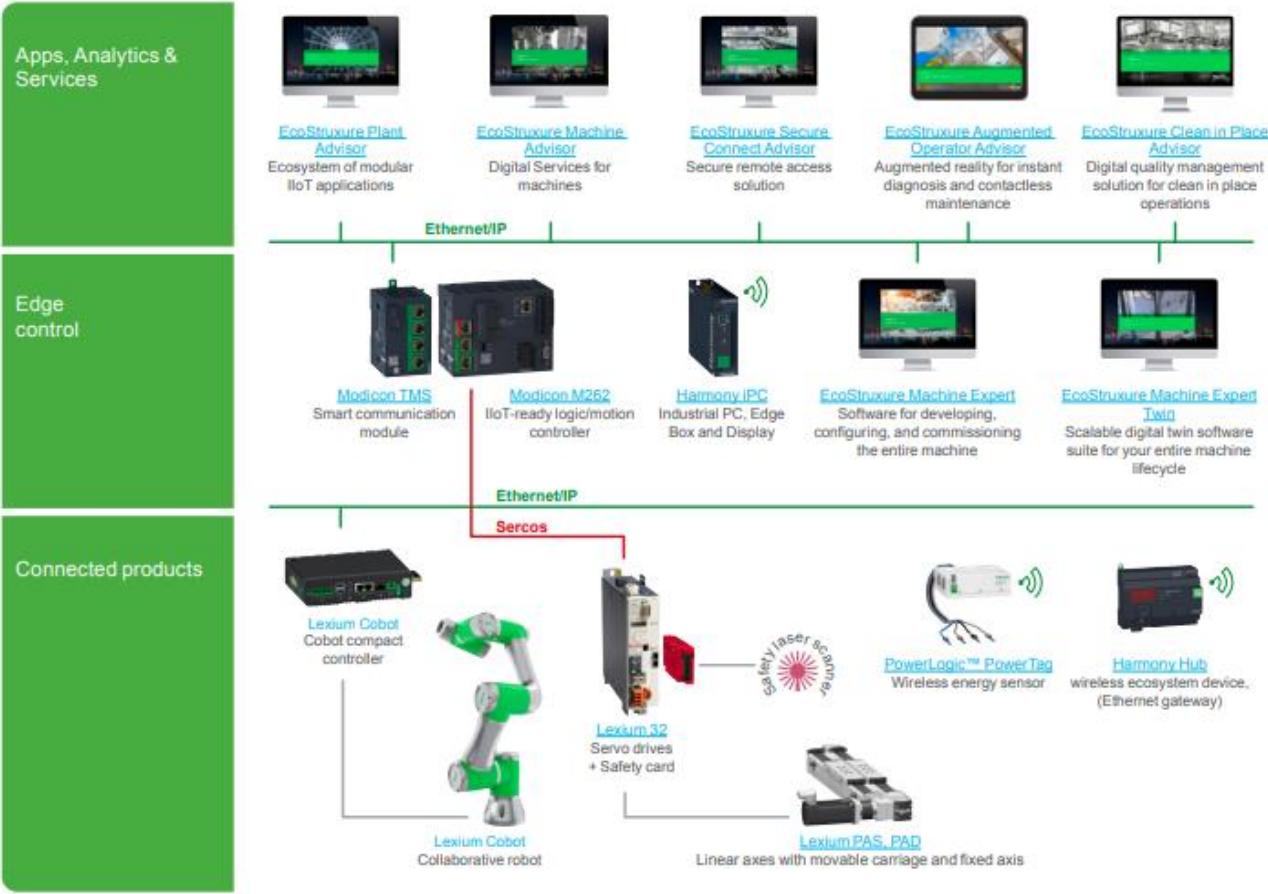- Small and compact size
- Mobile applications (AGV)

Data sharing sending commands

Life Is On | Schneider Electric
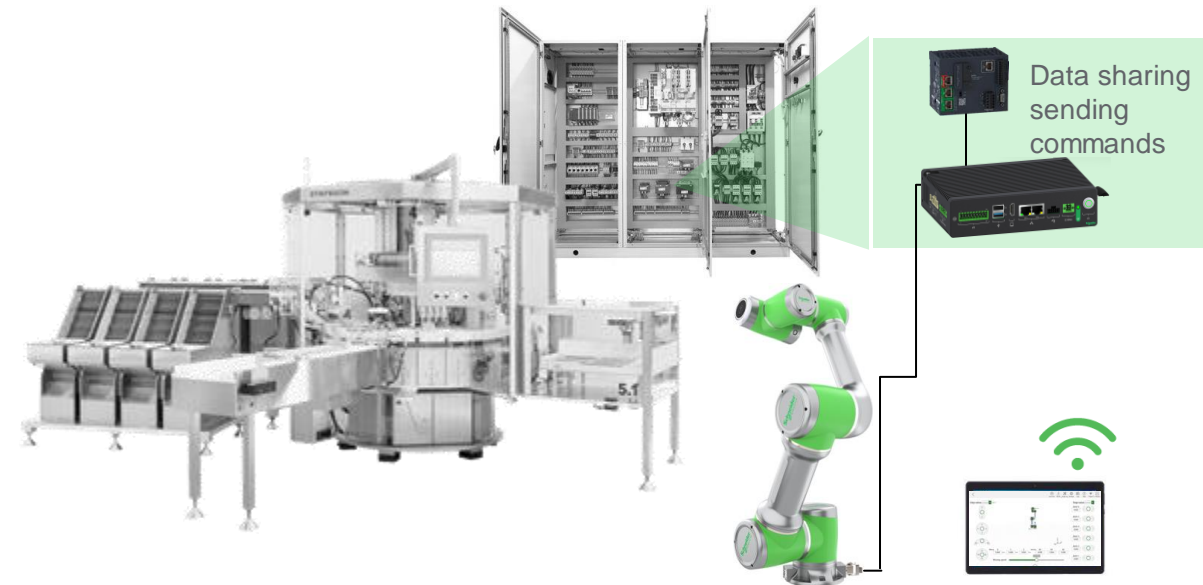
Lexium Cobot inside of a EcoStruxure machine solution

EcoStruxure™ Machine delivers Schneider Electric's **smart machine solutions**, which are built on our IIoT-enabled open and interoperable **EcoStruxure architecture**.

Schneider Electric's vision for smart machines is part of a **connected**, **cybersecure** production system based on **EcoStruxure Machine**, that enables OEMs to design **more efficient**, **more flexible**, **better connected**, and **safer** machines through advanced digital technologies and open standards.

Apps, Analytics & Services

EcoStruxure Plant Advisor — Ecosystem of modular IIoT applications

EcoStruxure Machine Advisor — Digital Services for machines

EcoStruxure Secure Connect Advisor — Secure remote access solution

EcoStruxure Augmented Operator Advisor — Augmented reality for instant diagnosis and contactless maintenance

EcoStruxure Clean in Place Advisor — Digital quality management solution for clean in place operations

Ethernet/IP

Edge control

Modicon TMS — Smart communication module

Modicon M262 — IIoT-ready logic/motion controller

Harmony iPC — Industrial PC, Edge Box and Display

EcoStruxure Machine Expert — Software for developing, configuring, and commissioning the entire machine

EcoStruxure Machine Expert Twin — Scalable digital twin software suite for your entire machine lifecycle

Ethernet/IP

Sercos

Connected products

Lexium Cobot — Cobot compact controller

Lexium 32 — Servo drives + Safety card

safety laser scanner

PowerLogic™ PowerTag — Wireless energy sensor

Harmony Hub — wireless ecosystem device, (Ethernet gateway)

Lexium Cobot — Collaborative robot

Lexium PAS, PAD — Linear axes with movable carriage and fixed axis
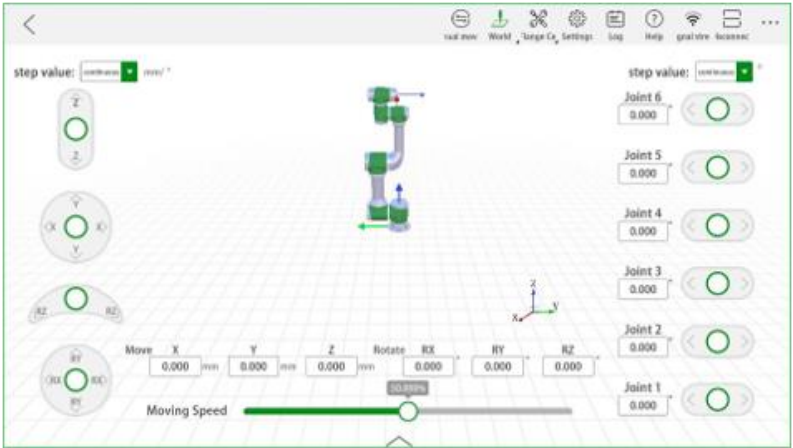
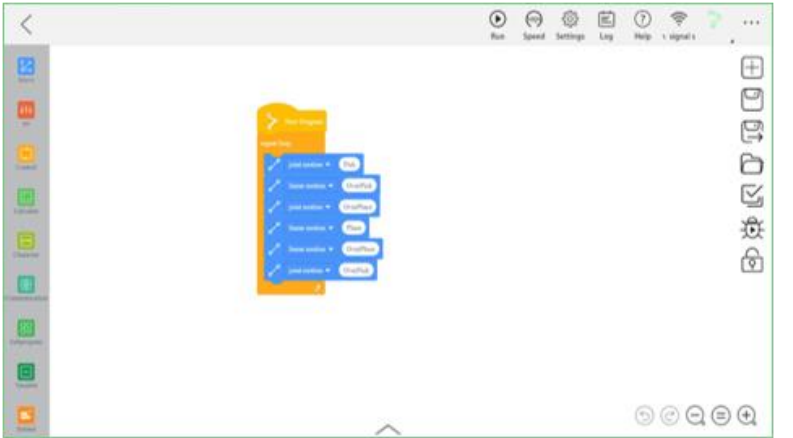Life Is On | Schneider Electric

Cobot Software/App

Everyone is a programmer

- Programming a robot couldn't be easier.
- User simply drags and drops the necessary command from the menu to the programing area and creates a programming flow.

User friendly interface

- Intuitive cobot app enables the users to monitor, program and operate the cobot easily.
- Users can manually operate the cobot by using job buttons or by setting the target position and see the cobot's movement in the app.

Life Is On | **Schneider Electric**

Segments and benefits

CPG	Automotive	Electronics	Metals and Machinery

• **75%** of CPG companies could increase in productivity with Cobots. *(~86%x90%)*
• Robot technologies empower staff to do more value-added work and reduce waste in operations.
• Cobots can help to **both cut costs** and **improve efficiency.**
• Cobots give flexibility to **customize the application/process freely.**
	• Cobots boost automotive **efficiency, productivity,** and **quality.**
	• They drive **Optimized interaction** between **humans and robots**
	• Cobots are **designed for human interaction**
	• Collaborative employee **judgment capabilities** can **guide Cobot actions.**
	• **Cobots work** more **safely side by side with humans** than traditional robots.
	• Cobots can perform tasks that may be dangerous or injury-prone for humans thus **reducing workplace injuries.**
		• **Cobots** allow for **precise** and **accurate assembly** of electronics parts.
		• Built-in sensors allow **Cobots** to **work** with **fragile products.**
		• **Reduced errors** and **improved** process **efficiency** and **productivity.**
		• **Faster operations** and **reduced downtime** with **less waste.**
		• **Less defects** and **better ROI**
		• **Improved agility:**
		  — Fast and **easy programming boosts agility** in manufacturing
		  — Easy to **adapt output** to meet **changing volumes** and **consumer demands**
			• **Reduced employee** staffing, training and retention **costs**
			• **Improved worker safety** – less need for staff to do hazardous jobs.
			• **Lower safety** compliance **costs** and potential fines
			• **Reduces** risk of repetitive stress **injuries**
			• **Lower risk** of incidents caused by lack of attention (for boring, repetitive tasks)
			• Potentially **lower costs** due to **insurance** claims
			• **Lowers** the productivity impacts of **employees missing work** due to injury
			• Cobots can work **consistently** without tiring or losing concentration.

The easy programming and commissioning interface helps Cobots reduce setup and changeover time during commissioning and production. Products produced in CPG and Automotive plants are updated and changed on a regular basis and production lines must be modified to accommodate these changes
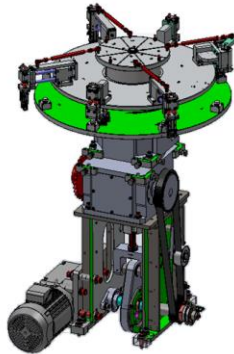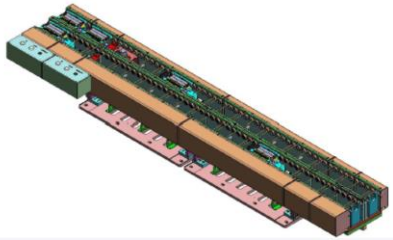
Life Is On | Schneider Electric

Life Is On | Schneider Electric

Internal

EcoStruxure™ Automation Expert (EAE)

INTERFACE SYSTECH : AMR Implementations

Machine Integrator - Thailand

Life Is On | Schneider Electric
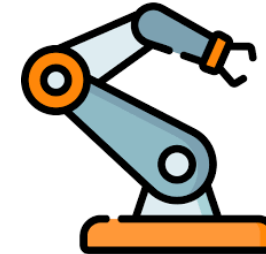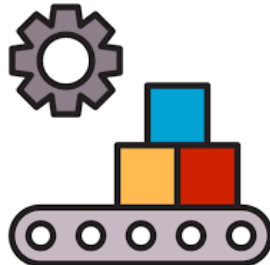
Property of Schneider Electric

# History & Technology Development

AMR : Autonomous Mobile Robot

CMR : Collaborative Mobile Robot

MATRIX

Autonomous mobile robots offer the latest navigation technology, requiring no wires, magnets, tape or other guidance infrastructure like traditional AGVs.

Instead, simultaneous localization and mapping (SLAM) technology enable robots to build their own map of the operating environment and use onboard sensors and cameras to process their surroundings, self-locate and navigate based on real-time conditions.
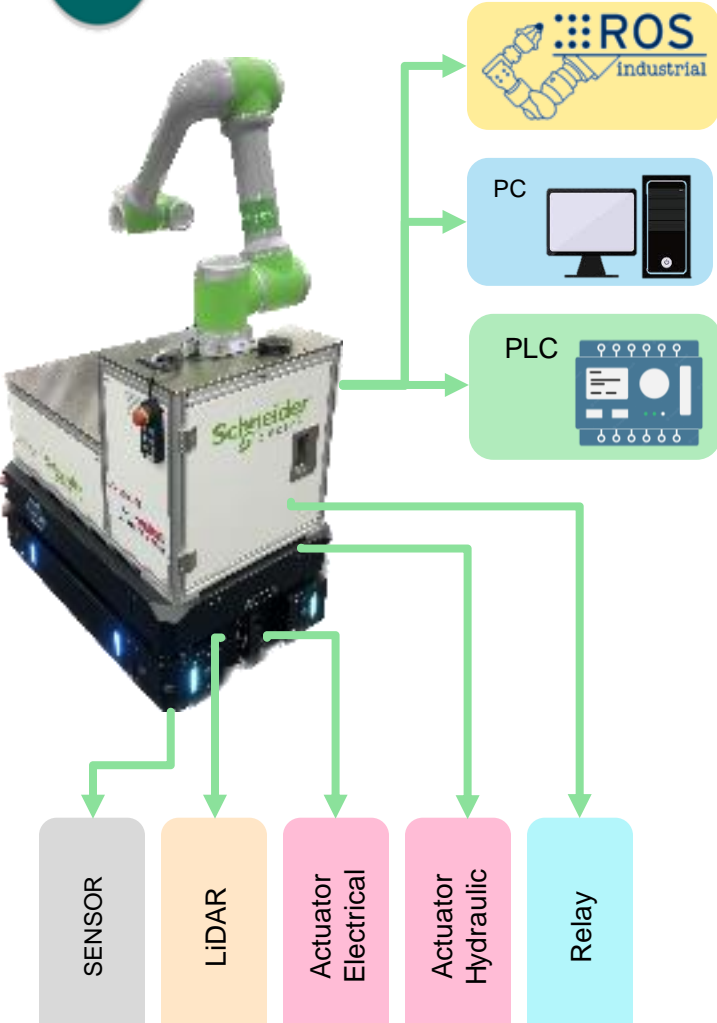
THE CHALLENGE
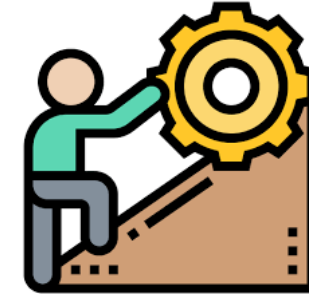
Reduce some hardware component and needs to find software for manage all software in our AMR robot.
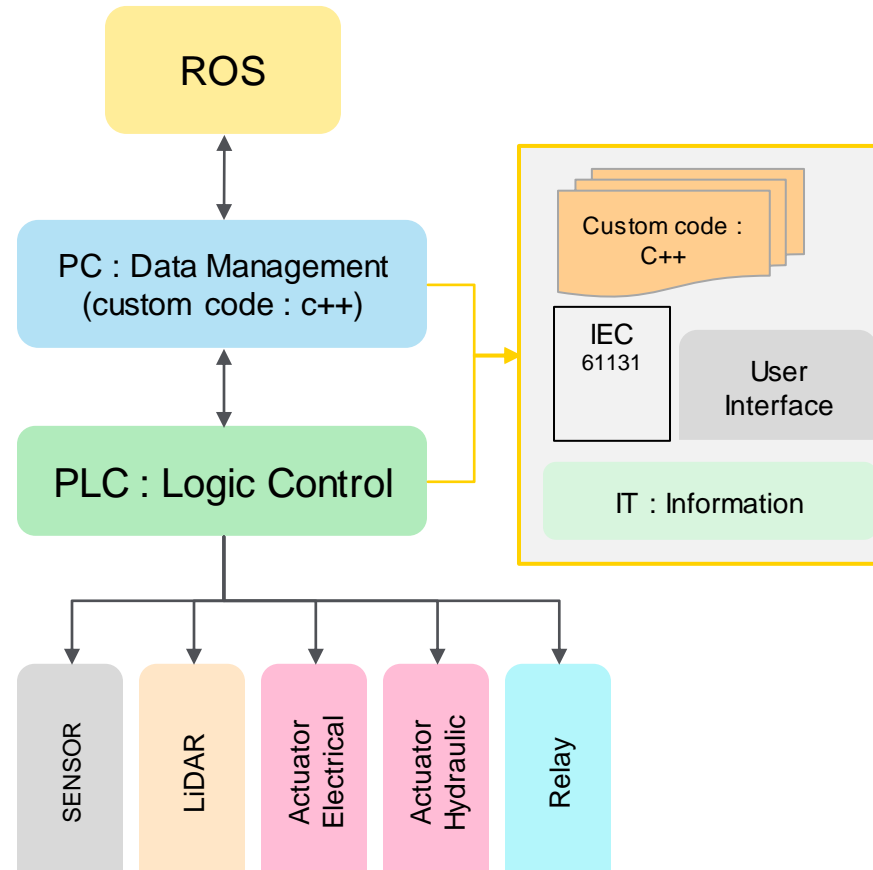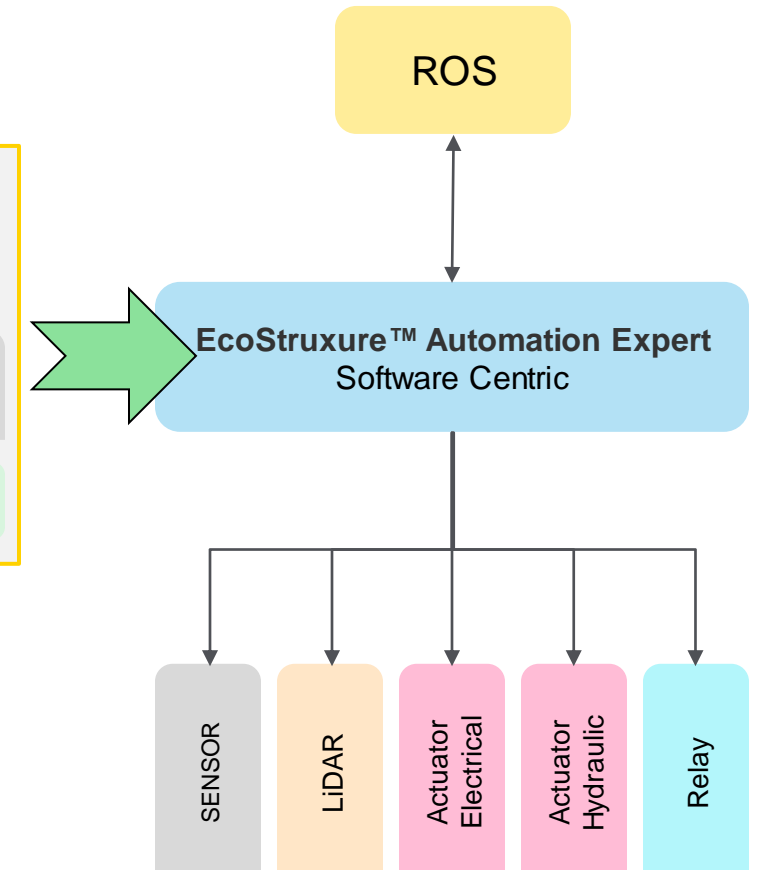
PLC

INTERFACE SYSTECH CO., LTD.

Currently Architecture

New system Architecture

Benefits
- ➤ Automation software centric.
- ➤ Save engineering time and development design.
- ➤ Flexibilities to building architecture.
- ➤ Simplify hardware.

Life Is On | Schneider Electric

Schneider Electric (Industrial Automation)
เปิดอบรมแก่ผู้ที่สนใจ โดยไม่มีค่าใช้จ่ายใด ๆ

ตารางอบรมเดือนกรกฎาคม 2566

11-12 กรกฎาคม : **Pro-face engineering Software BLUE (ST6000 with Versatile Software BLUE)**

18-20 กรกฎาคม : **SCADA Software - BLUE Open Studio**

25 กรกฎาคม : **Soft starter ATS480**

สแกน QR-Code
เพื่อลงทะเบียน

Internal

Life Is On | Schneider Electric