Next Generation Automation Systems for the Smart Factory

EcoStruxure Automation Expert

Open Process Automation

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Offer descriptions

EcoStruxure Control Expert (Unity)

Engineering software based on IEC61131 standards to engineer, commission, and maintain Modicon PAC controllers for discrete manufacturing, infrastructure, and hybrid applications.

EcoStruxure Machine Expert

Engineering software based on the IEC61131 standards to design, engineer, commission, and maintain the entire machine in a single software environment.

EcoStruxure Automation Expert

Automation System – A new category of software and hardware based on **IEC61499** standards for interoperability and portability. EAE is an asset-centric automation system designed to manage the complete automation lifecycle for next-generation industries.

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EcoStruxure™ Plant

Innovation At Every Level

EcoStruxure Architecture

Apps, Analytics & Services

EcoStruxure Industrial Software
Engineering Planning & Operations   *Asset Performance Control and Information*

EcoStruxure Profit Advisor

EcoStruxure Control Advisor

EcoStruxure Asset Advisor

EcoStruxure Resource Advisor

End-to-end Cybersecurity

Cloud and/or On Premises

Edge Control

Modicon

EcoStruxure Control Expert

EcoStruxure Hybrid DCS

EcoStruxure Foxboro DCS

EcoStruxure Triconex

SCADA Systems

EcoStruxure Power Monitoring Expert

Connected Products

Harmony

Foxboro Field Devices

TeSys

Sensors & RFID

Altivar

Intelligent Power & Motor Control Center

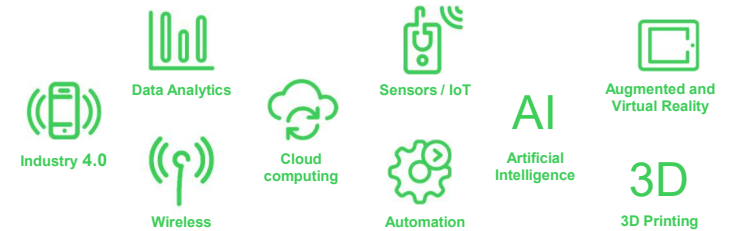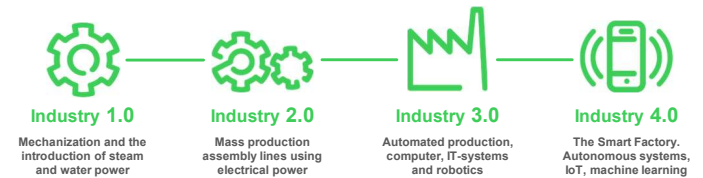Life Is On | Schneider Electric

The Future is not business as a usual

The next quantum-leap in industrial automation

2021: Software-Centric Automation

- After 50 years, it is not hardware but software that is driving automation to the next level

- Software-driven digital transformation is fueled by increased computational power and connectivity

- Addressing our customers imperatives requires unprecedented flexibility, interoperability, and efficiency from industrial operations

- The IEC 61499 standard with its event-driven, object-oriented, distributed approach is extending/enhancing the IEC 61131 standard, allowing automation systems to take advantage of IT technologies
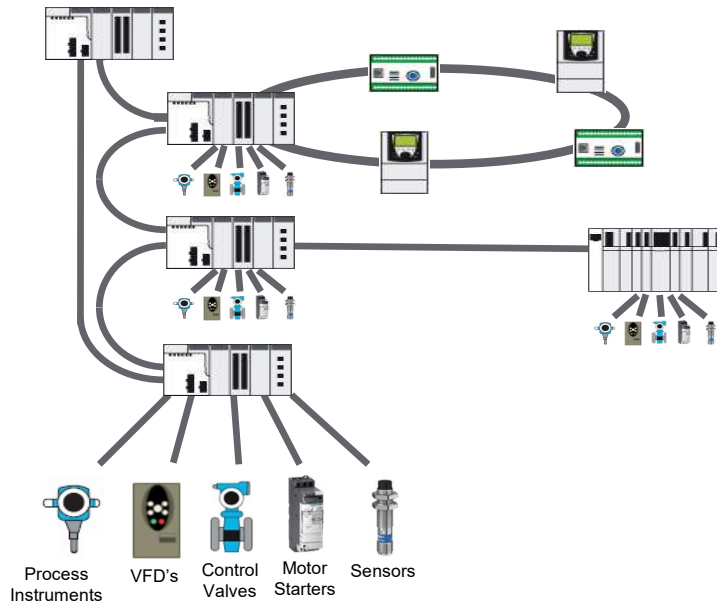
The Four Industrial Revolutions

Industry 1.0
Mechanization and the introduction of steam and water power

Industry 2.0
Mass production assembly lines using electrical power

Industry 3.0
Automated production, computer, IT-systems and robotics

Industry 4.0
The Smart Factory. Autonomous systems, IoT, machine learning

Industry 4.0

Data Analytics

Sensors / IoT

Augmented and Virtual Reality

AI
Artificial Intelligence

Cloud computing

3D
3D Printing

Wireless

Automation

Automation is key - where the physical meets the digital to close the loop from "*insight to action.*"

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PLC Systems today
Hardware Centric Design

Logic Driven Single PLC

Process Instruments   VFD's   Control Valves   Motor Starters   Sensors

- **Dumb IO - Not capable of running logic**

- **Need PLC to "grab" information from devices**

- **Example: Control of a Motor Starter**

  - **Input device triggers logic to run Motor**

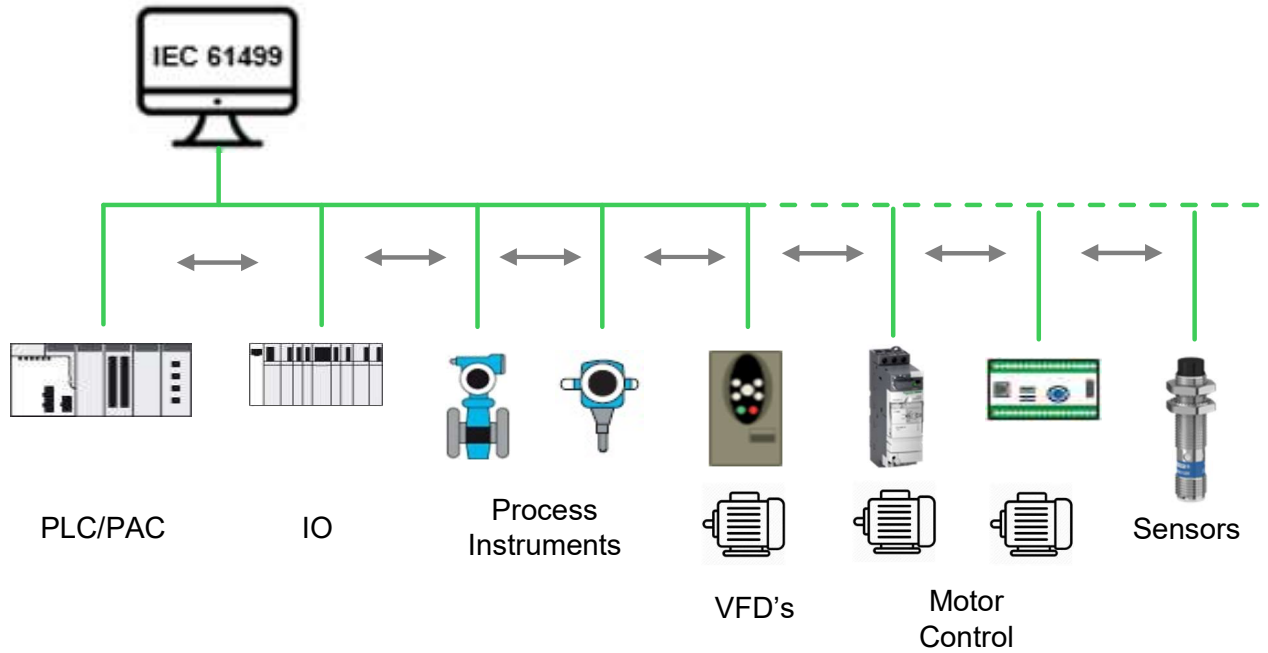 - **Output turns on.**

  - **Feedback wired back to another input**

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Smart Devices

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PLC Systems in the future
Software Centric Design

Automation Expert

IEC 61499

PLC/PAC   IO   Process Instruments   VFD's   Motor Control   Sensors

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PLC Systems in the future
Software Centric Design

Automation Expert

IEC 61499

- PLC/PAC
- IO
- Process Instruments
- VFD's
- Motor Control
- Sensors

- Entire System / Plant visible from a single software application

- Separate Hardware from Software

- Any Smart device can potentially run code

- Each device has the same "Runtime"

- Truly distributed control but managed as ONE system.

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PLC Systems in the future
Software Centric Design

Automation Expert

IEC 61499
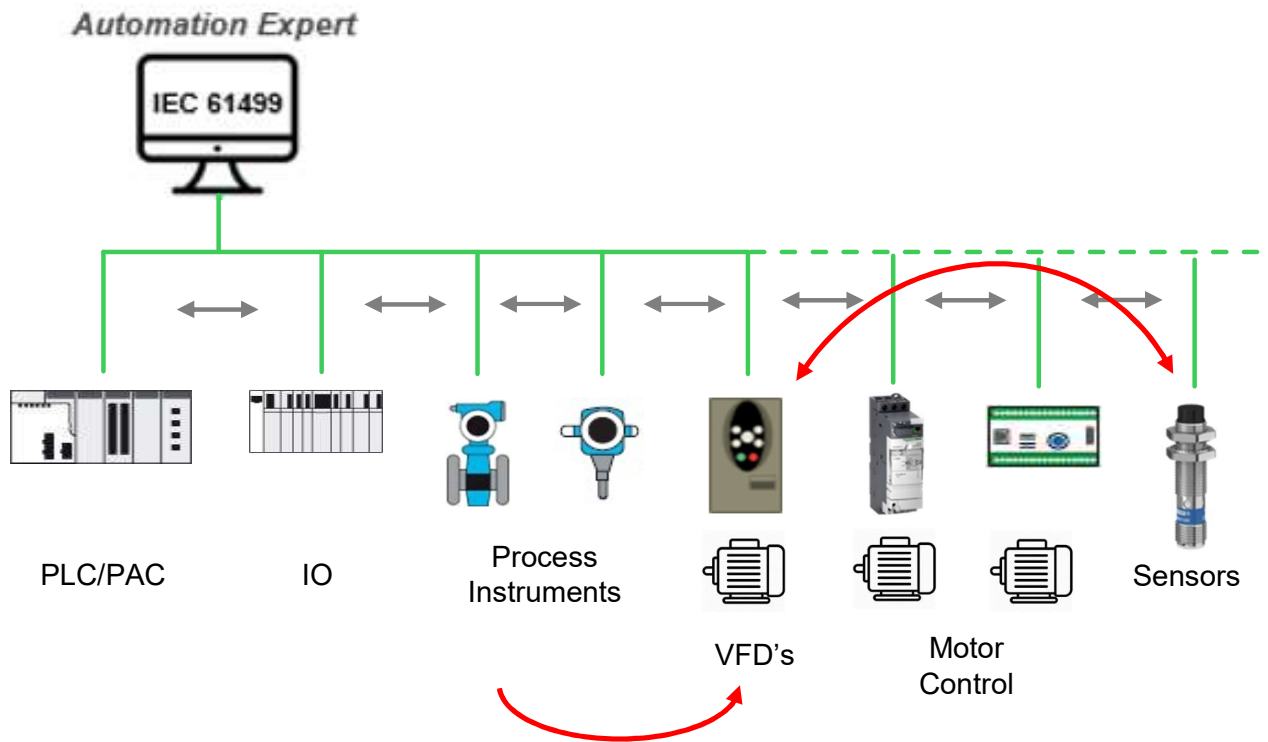
Universal Automation IEC 61499
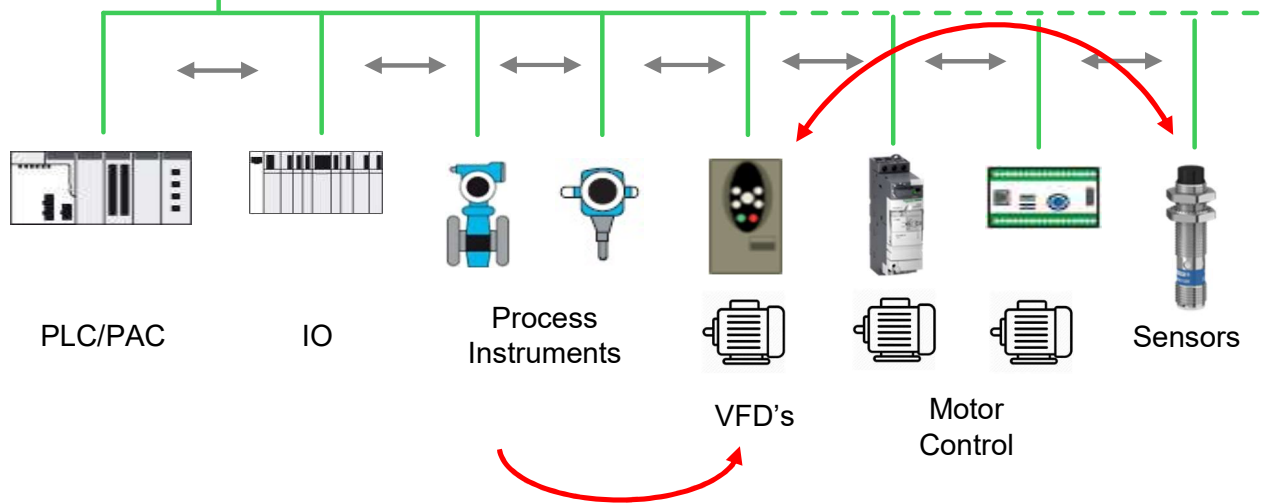
PLC/PAC

IO

Process Instruments

VFD's

Motor Control

Sensors

- Entire System / Plant visible from a single software application

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- Truly distributed control but managed as ONE system.

- Customer can use Best in Class Hardware

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UniversalAutomation.Org

SE USA

What is UniversalAutomation.Org?

UniversalAutomation.Org is an independent, not-for-profit association managing the implementation of an industrial automation shared source runtime, based on the IEC61499 standard. This new level of shared technology provides the basis for an ecosystem of portable, interoperable, "plug and produce" solutions and creates an entirely new category within industrial automation. UniversalAutomation.Org is open to new joiners willing to change the game of automation.

Imagine the same "Runtime" on many different devices

Todays offer

Scalable common runtime platform

ATV dPAC Module

- Optimized performance
- Specialized I/O
- For ATV 340-600-900

M251 dPAC

- Medium performance
- Distributed IO head
- Limited IO scalability
- TM3 I/O range

M580 dPAC

- High performance
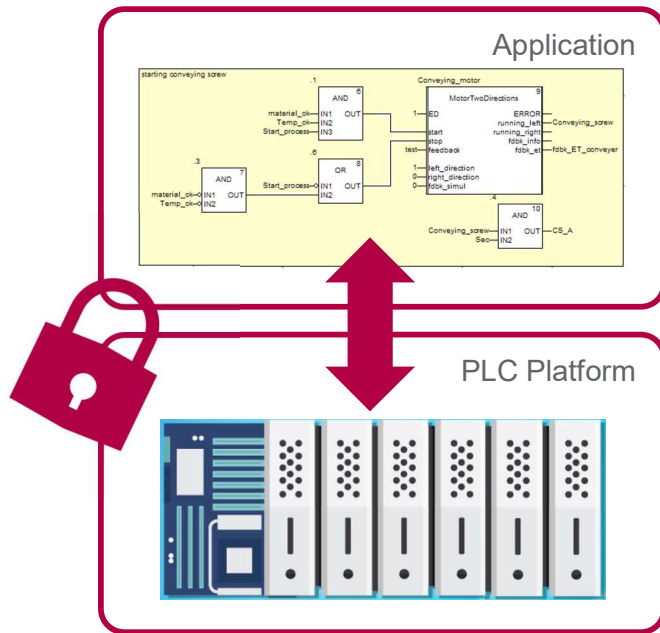- Extended IO scalability
- x80 I/O range

Soft dPAC

- Scalable performance
- Virtual PLC and edge computing
- Highly integrated
- Highly flexible

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NEXT-Gen Controller - Preview

Driving Towards 100% Effectiveness

Difficult to re-use
Resistant to change
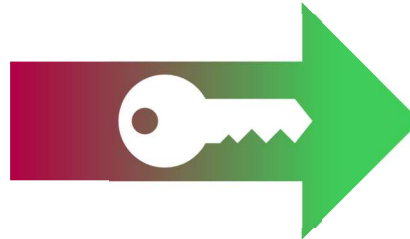
Independent HW / SW lifecycles
Just in time linking
Portable, reusable, interoperable, agile

Application

PLC Platform

Application

Symlink

Platform

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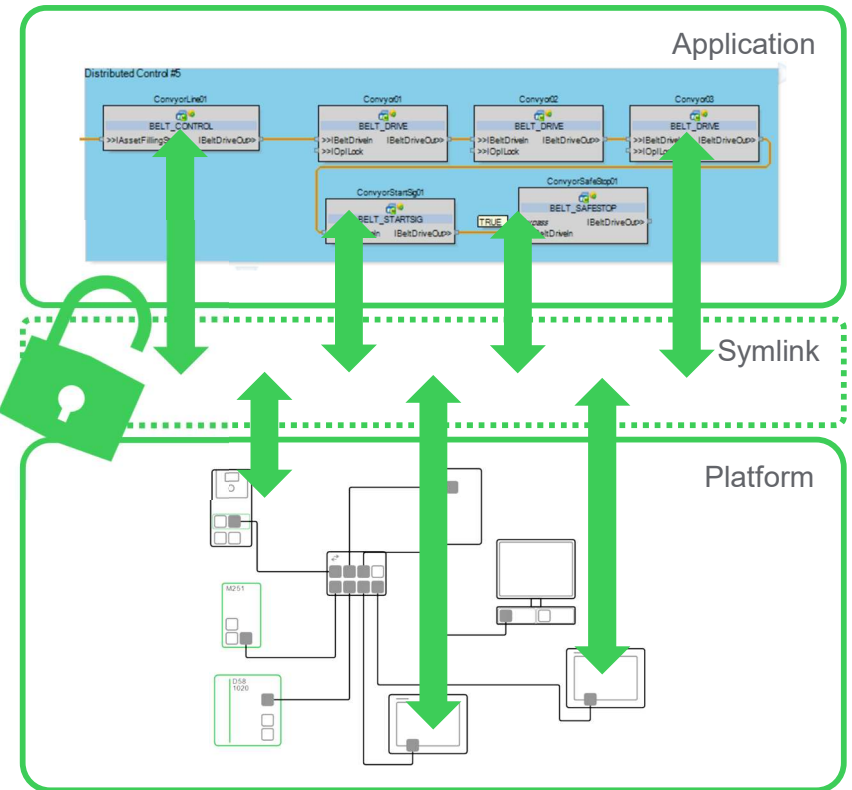
Asset Orientated Engineering

Next Generation Engineering Platform

Single tool to configure, program and deploy applications to multiple control and HMI devices.

Control, HMI, documentation etc. encapsulated into asset models to manage complexity and support reusability & fast refactoring

CAT Object Model

Object Properties

Physical Asset

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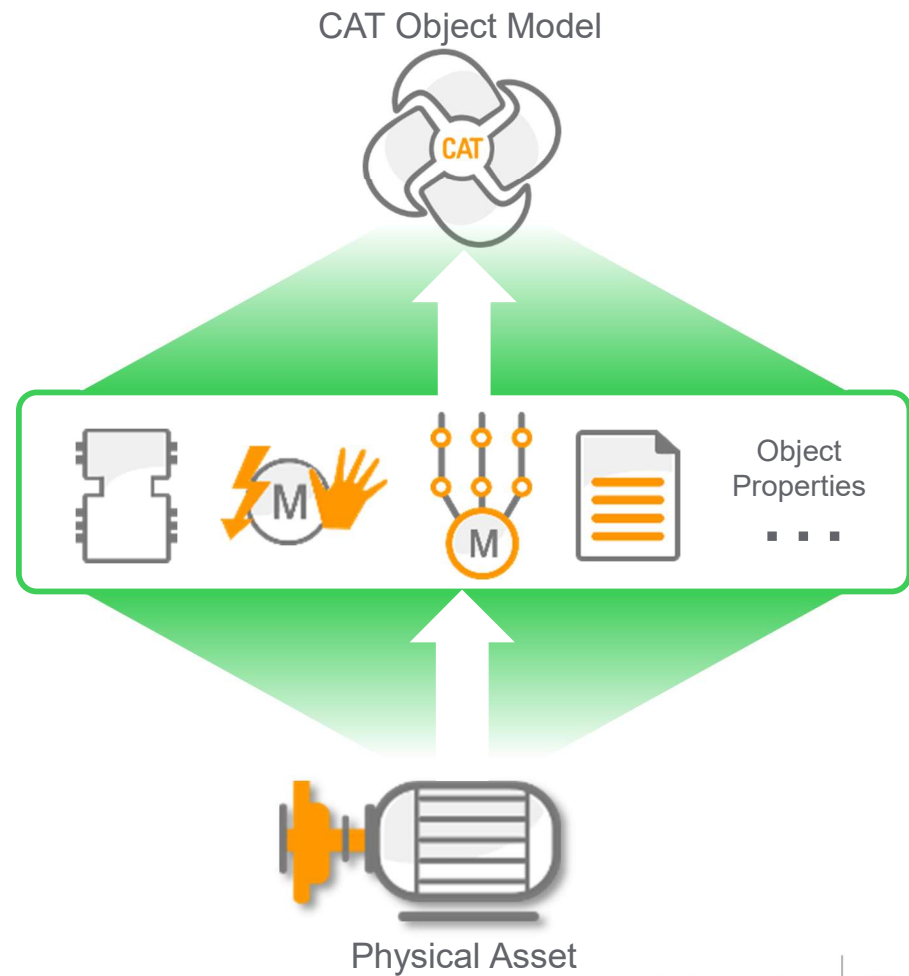
Asset Centric Automation-Modular machine/process
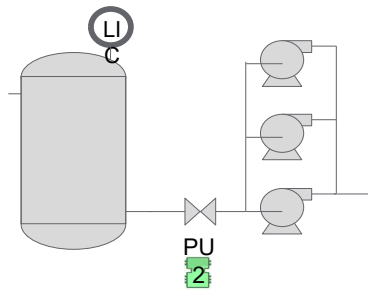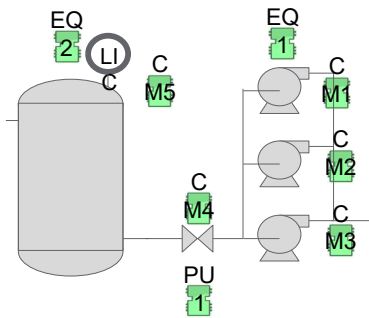
Single line engineering with adapters
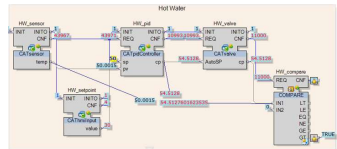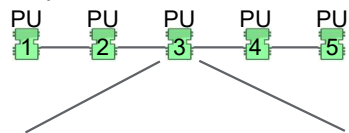
Process Engineer Commisioning

Automation specialist

Master complexity
- Representing real devices as ready-to-use software objects, encapsulating all their aspects - Building block for CPS.
- Complexity hidden from users.

Efficient engineering
- Using proven-in use library instances
- From process specification (P&ID) to detailed control program very quickly
- Maintain one software library Independent of control hardware
- Quicker commissioning

Modular Machine Process
- Match control modularity with mechanical/electrical modularity
- Expand by adding modules

Embed IP/know-how libraries

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Driving to 100% engineering efficiency

Existing automation approaches and tools are not optimized for the creation and management of modern data-driven automation systems.

EcoStruxure Automation Expert takes
a software-centric approach that:

- Eliminates low-value engineering tasks

- Enables efficient wrap and reuse of automation objects

- Provides rapid agility to process changes

- Scales simply across connected networks

- Bridges the divide between IT and OT systems

Minimize engineering costs and react rapidly to market opportunities by eliminating delays associated with system refactoring.
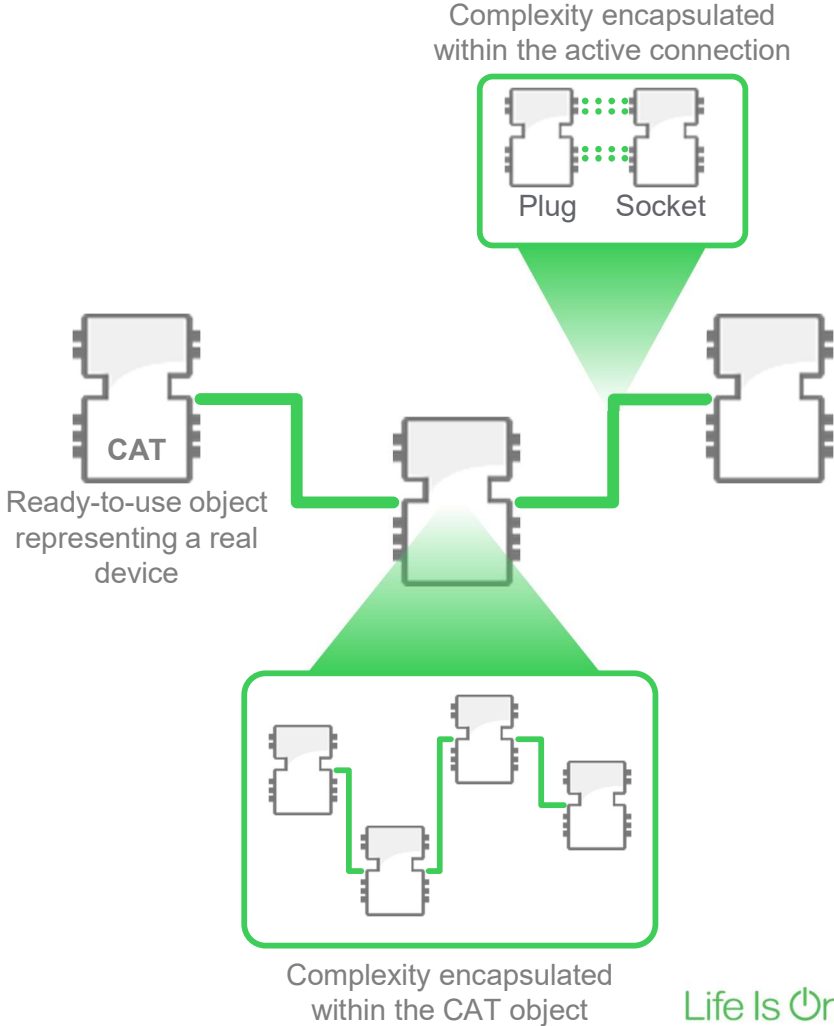
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Single Line Engineering
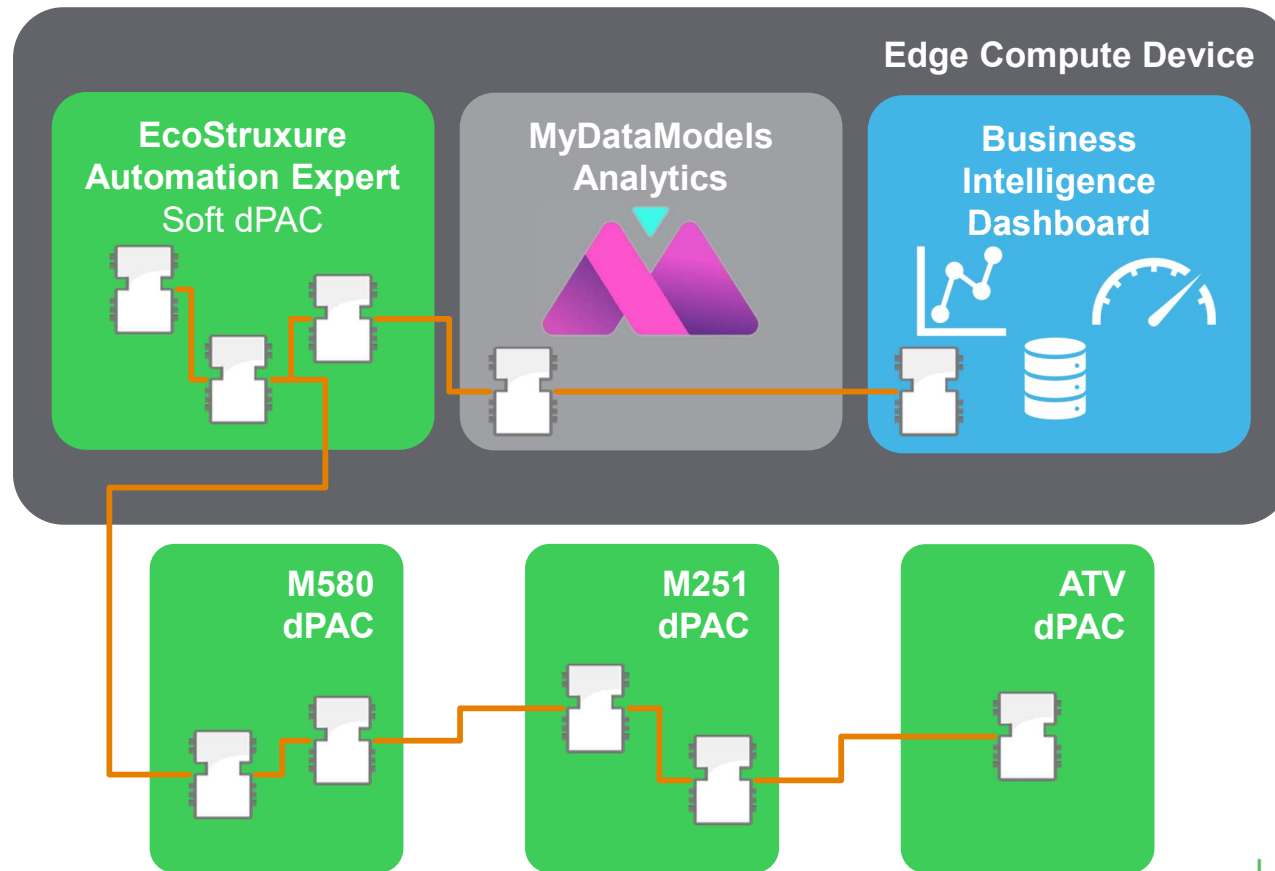
Simplified Engineering Process

Aggregations of event and data connections between function blocks resulting in one single line connection back & forward.

Complexity managed through smart engineering results in dramatically reduced time and effort with fewer mistakes, higher quality.

Complexity encapsulated within the active connection

Plug   Socket

CAT
Ready-to-use object representing a real device

Complexity encapsulated within the CAT object

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Driving Towards 100% Effectiveness

Intensive computation, native integration

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Best-in-class technology

Native object orientation
Intuitive represention of real assets as ready-to- use software objects and libraries. Providing the building blocks for cyber-physical systems.

Object-orientation

**Hardware abstraction**

Abstracted hardware platform
Complete lifecycle and engineering independence between software and hardware platforms with full re-usability.

Modular application
Flexible deployment of your automation project across controller resources via drag and drop. Automatically generated cross-communication.

Distributed intelligence
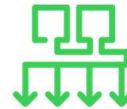
Single application

System orchestration
Scalable, user-friendly management of distributed architecture systems including 3rd party hardware integration.

Engineering efficiency
Integrated development environment for all tasks of automation system engineering and management.

Integrated engineering

Data consistency

Industry 4.0 ready
Native integration with IT systems with direct access to field data including at source time-stamping.

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