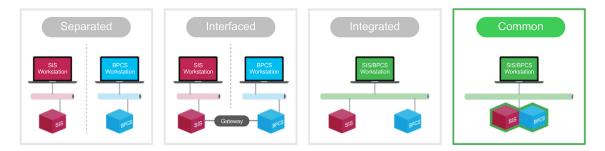# Hybrid Industry Market trends

## Flexible Safety Topologies

- The M580 Safety ePAC advanced safety architecture provides a flexible platform to implement safety systems, whether your process requires Separated, Interfaced, Integrated or Common Safety topologies.
- With our state of the art Common Safety technology, the M580 Safety enables full integration of process and safety functions while enforcing isolation and independence between safety and non-safety related operations.
- Safety and non-safety hardware modules can be mixed seamlessly to provide a high level of flexibility, adaptability and ease-of-use with a common engineering environment, full authentication and authorization of protected safety tasks.



## What is the importance of Common Safety?

Our advanced Common Safety architecture enables seamless integration between automation and safety systems, reducing systematic complexity to:

- Simplify project engineering resulting in less training, fewer defects, compressed project schedules and faster time to profit
- Eliminate external communication devices and associated installation, configuration, integration, spares, and maintenance costs
- Making fault finding faster and fault elimination easier, leading to higher availability, reduced MTTR and safer, more profitable operations
- Transparently integrating systematic cyber security and dedicated safe communication black channels to reduce operational risk
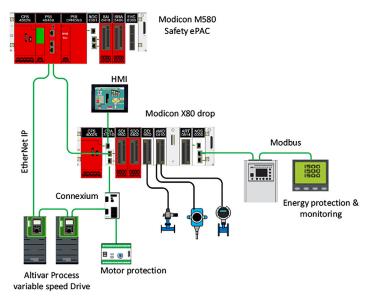
## The M580 ePAC platform

M580 Safety extends our state-of-the-art M580 range and provides:

- High performance, cyber secure, and scalable process controllers
- Robust, high density, and cost effective IO systems
- Simple, flexible, and agile system architectures
- Native Ethernet support and open, secure, and transparent communications
- Full integration with Schneider Electric EcoStruxure Plant connected devices, edge controllers, and apps, analytics, and services

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# Standalone solution

- An application which must be safe in operation where production availability is less critical.
- Dual certification supports combined process and machine Safety applications
- Sistema libraries for Machine Safety are available from Schneider website
- Ethernet-based communications to X80 Safety IO and other Safety PACs.
- Safe, open communication to third-party devices via EtherNet/IP (CIP Safety standard) planned for 2019.
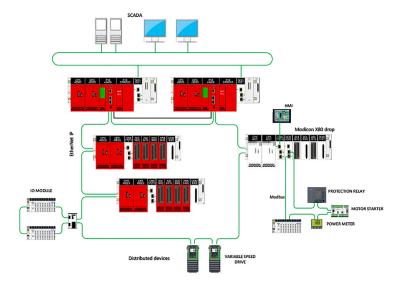- Schneider Electric ConneXium cyber secure when switches are needed to ensure maximum cyber security

Architecture with standalone M580 Safety based on Common Safety



# Redundant solution

- Highly available safety offer for when downtime is not an option and full availability of safety functions is required
- Redundant power supplies supported to provide high availability in case of power failure (also available for standalone solution)

Architecture with redundant M580 Safety including Hot Standby CPU and redundant power supplies



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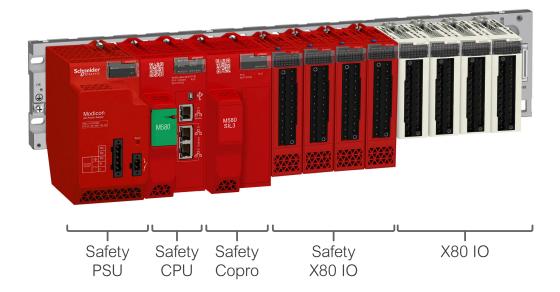# Engineer your safety and non-safety in a single, unified engineering tool: EcoStruxure Control Expert

- Includes predefined, certified safety function blocks including **machine** and **BMS** (Burner/Boiler Management System) libraries
- New licensing system allows easy upgrades from non-safety to safety software.
- Independent process and safety tasks

# Comprehensive M580 ePAC and X80 compatibility

- Standard (non-interfering) X80 IO modules are fully compatible with the M580 Safety ePAC.
- Ethernet backplanes (BMEXBP) are required for M580 Safety CPU and Copro.
- X80 Safety IO modules may be used in both Ethernet and x-bus remote drops (BM•XBP backplanes) with BM•CRA 31210 remote adaptors.

A sample M580S configuration with mixed Safety & Standard X80 IO (Common Safety)

Safety PSU | Safety CPU | Safety Copro | Safety X80 IO | X80 IO

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# Meet your cyber security challenge with M580 Safety

## Modern safety systems must be cyber secure, and M580 Safety benefits from the same market leading embedded cyber security features as the standard M580

The Modicon M580 integrated cyber security has proven secure under both real world and simulated cyber attack. By encrypting and verifying hardware, firmware, and software systems together at every startup and during runtime, critical system integrity is maintained, secure from unauthorized modification.

The M580 range further secures your critical process with

* Integrated IPSec communications protocol: AH* or ESP*
* Achilles Level 2 cyber security certification
* Encrypted authentication and authorization
* Internal and external cyber security event audit trail
* Hardened access control, default security 'out of the box'
* Integrated management within Unity Pro platform
* Security levels are configurable by authorized plant personnel



*AH = Authentication Header
*ESP = Encapsulating Security Payload

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# The M580 Safety Range

| Category | Reference | Description |
|---|---|---|
| Single Safety CPU | BMEP582040S | M580 CPU 8 MB |
| | BMEP584040S | M580 CPU 16 MB |
| Redundant Safety CPU | BMEH582040S | M580 CPU Hot Standby 8 MB |
| | BMEH584040S | M580 CPU Hot Standby 16 MB |
| | BMEH586040S | M580 CPU Hot Standby 64 MB |
| Safety CoProcessor | BMEP58CPROS3 | M580 CoProcessor (mandatory with all CPU above) |
| Redundant Safety Power Supplies | BMXCPS4002S | 100-240 Vac Redundant Power Supply |
| | BMXCPS4022S | 24-48 Vdc Redundant Power Supply |
| | BMXCPS3522S | 125 Vdc Redundant Power Supply |
| X80 Safety IO modules | BMXSDI1602 | 16 Digital Inputs 24 Vdc with line monitoring |
| | BMXSDO0802 | 8 Digital Outputs Positive Logic 24 Vdc / 0,5 A with line monotoring |
| | BMXSRA0405 | 4 Relay Outputs 24 Vdc - 24...230 Vac / 5 A |
| | BMXSAI0410 | 4 Analog Inputs Isolated Channels 4-20 mA |

| all safety modules above are provided as conformal coated version |
|---|
| The M580 Safety allows to design some Safety Integrated Functions (SIF) up to a SIL3 for Process safety regarding IEC61508 and IEC61511 and up to SIL CL3 / PLe / Cat.4 for Machine safety regarding IEC62061 and ISO13849-1. |
| ECC * mechanism has been implemented into Safety CPU in order to reinforce the reliability of the memory<br>*ECC : Error Code Correction" |



Safety CPU & Copro



Redundant Safety Power Supply

X80 Safety IO module

## Robust hardware for harsh environments

- All safety modules are conformally coated ("AVR 80" coating on electronic cards: treatment for severe environment)
- Standard X80 modules are available in ruggedized versions (Coated or Hardened: C or H ref) and provides electrical isolation and resistance to:
  - Condensation and moisture: F&B.
  - Dust: MMM and Infra.
  - Chemical corrosion atmospheres: oil and gas, chemical, and waste water.

**Operating in wet environment**
Increased resistance to 93% relative humidity level

**Use at high altitudes**
-Operating altitude from 0 to 5,000 m

**Operating temperature**
-25°C up to +60°C

**Extended immunity to vibration and shocks**
-3g
-15g shocks

**Extended immunity to corrosive area (gases, salt, and dust) for H & C versions including safety**
-ISA Gx, IEC 3C4/3S4 severity

**Extended EMC requirements**
-Radiated field 15 V/m (safety modules support 20 V/m)
-Electrostatic discharges 8 kV
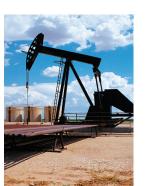
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# Typical applications

## Infrastructure Energy

- Highways, bridges, and tunnels
- Airport,
- Rail, and subway
- Energy
- Critical lighting and ventilation

## Oil & Gas Offside

- Reactor, utility, small, or auxiliary boilers
- Short batch systems
- Resettable systems
- Fire and gas protection
- Tank farms and oil and gas storage management
- Pipelines

## Consumer Packaged Goods

- Explosive environments (powder and alcohol storage, fire detection systems, etc.)
- Material Handling, conveyor control, and machine safety
- Burner control
- Reactor and other processes with elevated temperatures and pressures

## Water Waste Treatment Plant

- Biofuel systems
- Explosive/toxic gas detection
- Fire detection
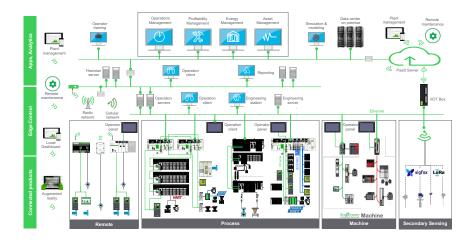- Material Handling, conveyor control, and machine safety

## Mining Minerals Metals

- Crane and hoist control (mine hoists and overhead cranes…)
- Material handling, conveyor control, and machine safety
- Burners, Boilers, Furnaces, and Compressors
- Gas, fire, dust, and detection systems

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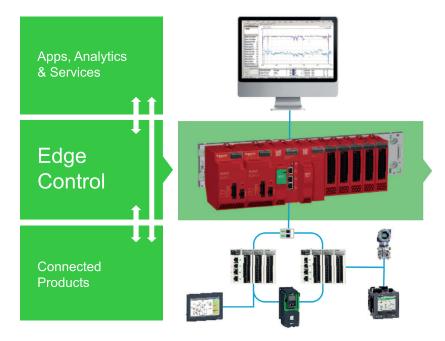
# EcoStruxure: Innovation At Every Level

EcoStruxure is our open, interoperable, secure, and IoT-enabled platform delivering enhanced value through **safety**, reliability, efficiency, sustainability, and connectivity. Today, EcoStruxure connects over 1 billion digital devices in more than 480,000 installations and with the release of the M580 Safety, Schneider Electric further expands the EcoStruxure platform and consolidates our position as the most trusted industrial safety vendor, with thousands of Modicon and Triconex safety systems protecting your people in the environment of the most critical industrial processes globally.



# From EcoStruxure to Edge Control

The Modicon M580 Safety gives you the power to design, implement, and run processes that efficiently employ the benefits of open networking, helping you:

• Access consistent and accurate data for timely decisions
• Reduce downtime with detailed insights into alarms and events
• Rapidly diagnose and identify root causes of issues
• Make informed decisions about plant operations and energy management



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