



Modicon M580 ePAC

The new controller for open-standard process automation

schneider-electric.com/m580

Life Is On

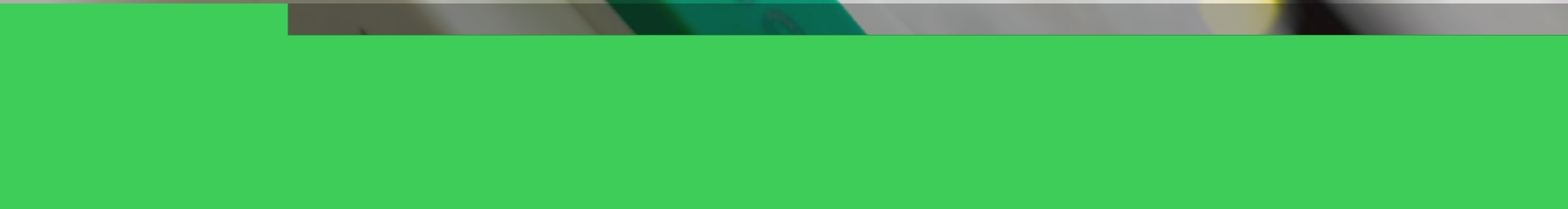
Schneider
Electric



Winner of the 2015 Engineers' Choice Award
by Control Engineering, the Modicon M580 ePAC
lets you drive productivity and boost performance
while preparing for the future



Pioneering controller
for smart connected operations



The PAC with native Ethernet is better than ever

With rapid development of the Industrial Internet of Things (IIoT), fast and easy access to operational data has become fundamental. Modicon M580, the first process automation controller (PAC) with Ethernet built into its core, simplifies data exchanges across your enterprise. A key component in smart connected operations, Modicon M580 meets your evolving needs in industrial automation.



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✓ Open yet cybersecure

In addition to Internet Protocol Security (IPsec) protecting communication over Ethernet — encrypted firmware, extended access list, protocol management, and the Achilles Level 2 security certification enable Modicon M580 to provide higher network resistance to cybersecurity threats.



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✓ A sustainable evolution

Upgrading to Modicon M580 is simplified by seamless migration plans for legacy applications. All Modicon units are managed by a single software — Unity Pro — to increase design productivity and controller performance. Furthermore, our life-cycle services keep your assets up to date.



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Intuitive for future generations

Modicon M580 lets you access all process data from mobile devices, answering the growing need for intuitive technologies.



Modicon's proven track record

From a groundbreaking programmable logic controller (PLC), Modicon™ technology has evolved over the last 30 years to bring revolutionary results.

Benefits of R&D and field experience

- 30+ years of experience in providing high-availability systems with redundancy
- 10+ years of continuous R&D for more robust Modicon X80 I/O cards
- 10+ years of continuous improvement in Unity™ Pro software



From a groundbreaking PLC to a high-end ePAC

2015 Modicon M580 high-end ePAC

Awarded Controller of the Year 2015 by Control Engineering

2014 Modicon M580 ePAC

Schneider Electric introduced the world's first ePAC, with Ethernet built right into its core

2007 Modicon M340

The first all-in-one PAC to simplify configuration and operation. Its innovative batteryless design supported remote unmanned applications.

2003 Modicon Quantum

The first controller with embedded Web server capabilities, breaking new ground in network communications

1996 Modicon Premium

The PAC to pioneer a new class of PLC, delivering high performance for large applications

1968 Modicon 084

The PLC to revolutionize the automation industry with solid-state circuitry and relay ladder logic



Customer testimonials

“I think that Modicon M580 will revolutionize our IAS (Integrated Automation System on ships) architectures.”

Barillec, France

“Modicon M580 is really the best controller I have ever seen.”

Bentec, Germany

“I am impressed and pleased with Schneider Electric’s vision of the future.”

Columbia River Carbonates, USA

“Modicon M580 is beyond my imagination with the incredible level of flexibility not only for the network architecture, but also the diagnostics and maintenance.”

FoShan DeXun Water Co., Ltd, China

“I was impressed with the result and specially with regards to scan times.”

Mars, Australia



What's new in Modicon M580



What's new in Modicon M580



MORE POWERFUL HARDWARE

Redundant CPU and power supply

Affordable high availability, avoiding costly downtime

Larger memory and higher bandwidth to SCADA

Faster execution time and practically no limitation in design

Internet Protocol Security (IPsec) support

IPsec allows secure communications over Ethernet, protecting your process know-how and data

New CANopen X80 module

Better connectivity with fieldbus



What's new in Modicon M580



ENHANCED SOFTWARE CAPABILITIES

Time-stamping extended to all variables

Improved traceability of processes and programs

Change configuration on the fly (CCOTF)

CCOTF functionality reduces downtime by allowing changes without stopping the process

What's new in Modicon M580



GREATER EASE IN DESIGN AND DEVELOPMENT

Migration plans for legacy applications

Extended to Modicon Quantum I/O and LL984 editor

Network communication manager

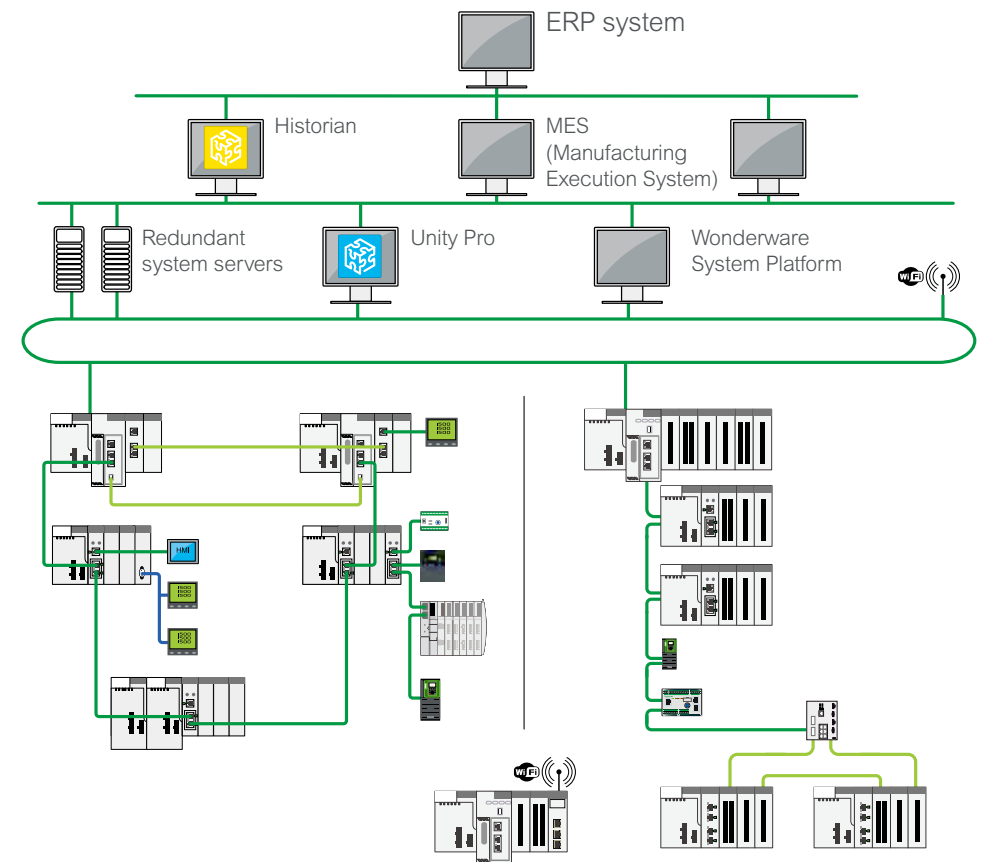
More effective process development for Ethernet architectures



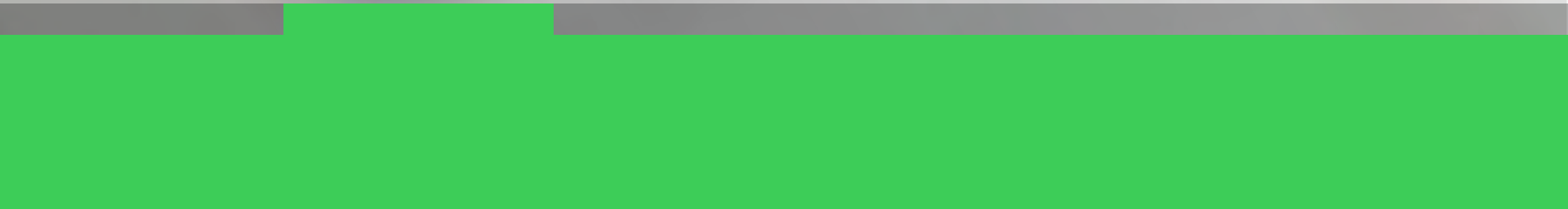
Automation solutions with greater transparency, availability, and flexibility



- From the field to enterprise levels, our automation architectures are based on the industrial standard Ethernet network
- The availability level can be tailored to your application constraints with redundancy for CPUs, and/or power supplies, and/or servers, and/or network
- The redundant CPU solution is based on a hot stand-by mechanism with high performance for switchover thanks to the dedicated communication link between CPUs
- For remote applications, extensions are possible via optical fibers between the CPUs or remote racks. Additionally, remote diagnostics can be performed via WiFi.



The high-end capabilities
of the world's first ePAC



Native Ethernet capabilities

Thanks to the built-in Ethernet backbone in Modicon M580, the components in your plant control architecture are seamlessly interconnected to reap IIoT benefits.



Native Ethernet capabilities

Thanks to the built-in Ethernet backbone in Modicon M580, the components in your plant control architecture are seamlessly interconnected to reap IIoT benefits.

Continuous communication flow

- Direct high-speed communication between control and devices for faster configuration and maintenance
- Direct high-speed deterministic communication between CPU and I/O modules for higher precision

Native Ethernet capabilities

Thanks to the built-in Ethernet backbone in Modicon M580, the components in your plant control architecture are seamlessly interconnected to reap IIoT benefits.

Integrated Ethernet infrastructure

- WiFi communication, fiber-optic converter, router, and switch functions are embedded into the configuration
- Easy cabling with third Ethernet port available on all Ethernet modules

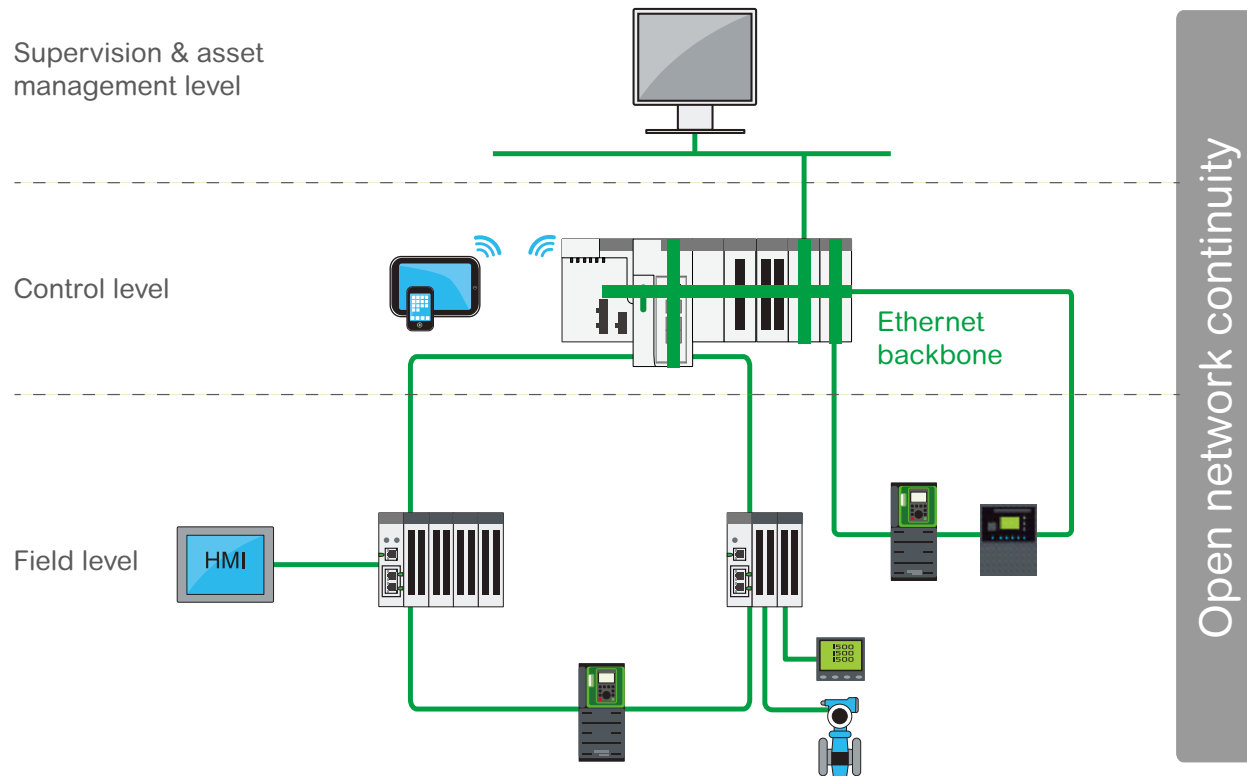
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Openness

- Open to third-party devices supporting Modbus TCP and Ethernet IP
- Standard FDT/DTM combined with Ethernet simplifies management of third-party devices
- Backplane open for easy design of Modicon X80 expert modules by CAPP partners (network socket communications, GPS support, weighing modules, and expert diagnostics)

Continuous communication from the field to enterprise levels



- Top-to-bottom standard Ethernet network
- Open architecture with direct Ethernet connection on backplane
- Ethernet remote I/O racks and drive on Ethernet service port of a drop

High performance and availability

Modicon M580 delivers a remarkably high level of computing power for increasingly data-intensive processes.

High performance and availability

Modicon M580 delivers a remarkably high level of computing power for increasingly data-intensive processes.

Key features

- Multi-core processor: parallel processing to optimize application execution
- No impact on scan time, even when processing large data flow, thanks to the unique Ethernet architecture

High performance and availability

Modicon M580 delivers a remarkably high level of computing power for increasingly data-intensive processes.

High performance

- End-to-end 100 Mbps speed, from top to bottom
- Application response time up by 10 times*
- 64 MB memory — data capacity up by 8 times*

*Compared with legacy ranges



High performance and availability

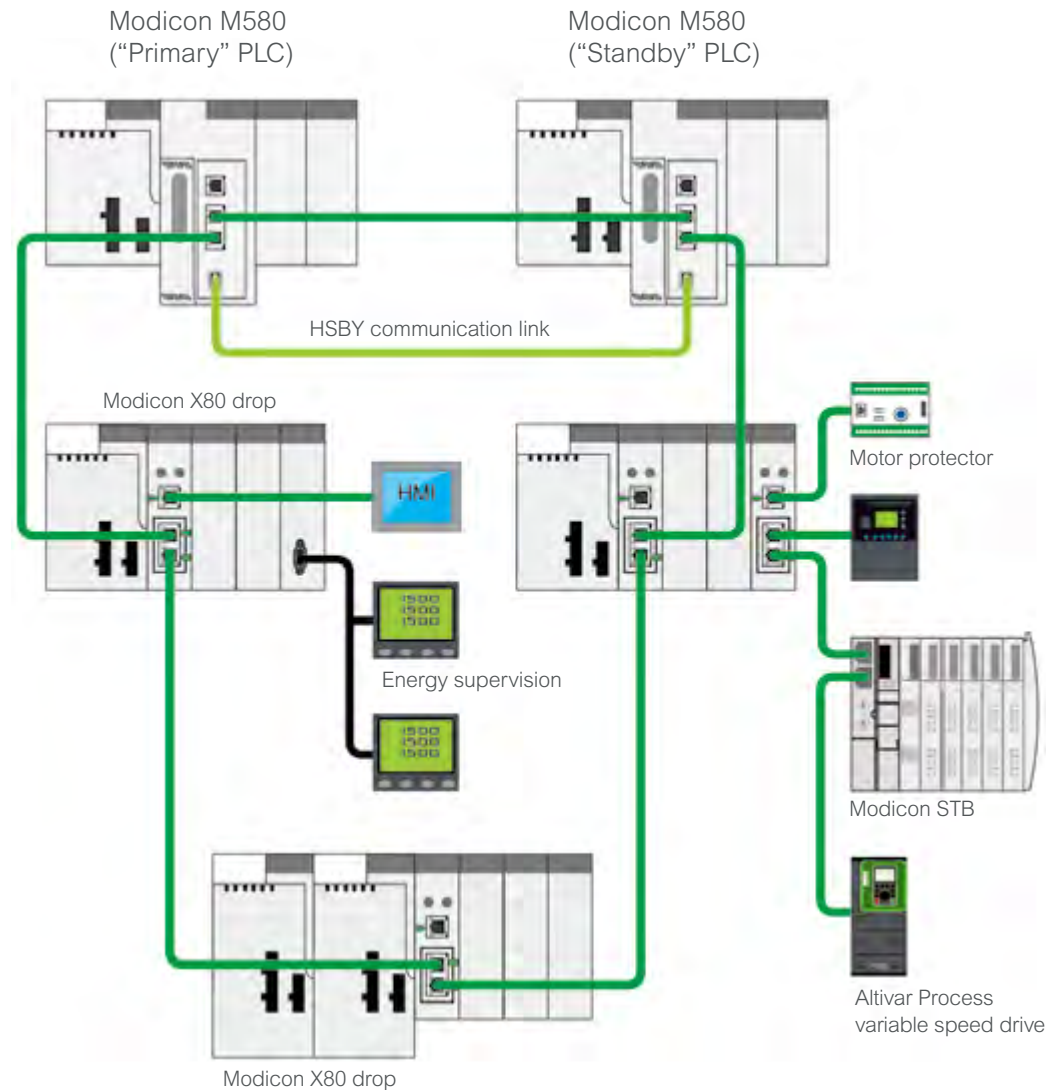
Modicon M580 delivers a remarkably high level of computing power for increasingly data-intensive processes.

High availability

- Availability rate of 99.9996%
- All-in-one redundancy in one CPU
- Logic mismatch function extends your maintenance capability
- 1 Gbps synchronization link to manage large applications
- Redundant power supply in sleep state to extend its life span

A high-availability system with hot-standby architectures

Modicon M580 hot standby provides a large choice of redundant architectures for your applications, from simple to complex solutions based on remote I/O or Ethernet DIO device architectures.



Enhanced cyber security

Modicon M580 is tested according to Ethernet services and protocols such as ARP, ICMP, TCP, IP, and more. Firmware and software integrity is checked at every start-up and during run-time, and encrypted in memory to prevent decompilation by a third party.

Cybersecure-ready

- IPsec communications protocol
- Cyber-security certified (Achilles Level 2)
- Encrypted password access
- Strict supervision of firmware and software integrity
- Easy to configure via the Unity Pro platform
- Audit trail of login
- Hardened access control



Successfully prevented cyber attacks by hackers during lab tests

Unity Pro cyber-security configuration

The screenshot displays the Unity Pro software interface for configuring the security of a RIO DIO Communicator Head. The main window is titled 'RIO DIO Communicator Head' and shows the 'Security' configuration page. The 'Global policy' section has 'Enforce Security' selected. The 'Services' section shows the following settings:

Service	Setting
FTP	Enabled
TFTP	Enabled
HTTP	Disabled
DHCP / BOOTP	Disabled
SNMP	Disabled
ELP	Disabled

The 'Access Control' section is set to 'Enabled'. Below this is a table showing the configuration for various subnets:

Subnet	IP Address	Subnet mask	FTP	TFTP	HTTP	Port502	ELP	SNMP
Yes	192.168.10.1	255.255.0.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yes	192.161.10.123	255.255.0.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yes	192.168.11.50	255.255.0.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	192.156.2.3		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	192.23.56.45		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	192.23.56.45		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The status bar at the bottom indicates 'Process succeeded : 0 Error[s], 0 Warning[s]' and shows system status indicators like 'HMI R/W mode OFFLINE', 'USB-SYS', 'MEM BUILT', and 'INS'.

- Easy to set the required security level
- Configuration does not require a cyber-security expert; configurable by authorized plant personnel
- The device's default mode is secure

More flexibility in design

With Modicon M580, you enjoy versatility in architecture design, allowing you to reduce development costs.



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Use Ethernet as an I/O network

- Flexibility in design thanks to a rich library of tested, validated, and documented architectures (TVDAs)
- Ring architecture provides additional network resilience

More flexibility in design

With Modicon M580, you enjoy versatility in architecture design, allowing you to reduce development costs.

Mix core control devices on Ethernet

- Flexible topology allows simple integration of core control devices
- Ability to mix remote I/O, distributed I/O, and other devices on the same Ethernet field network with easier software integration
- Transparent access to data through Ethernet backbone

More flexibility in design

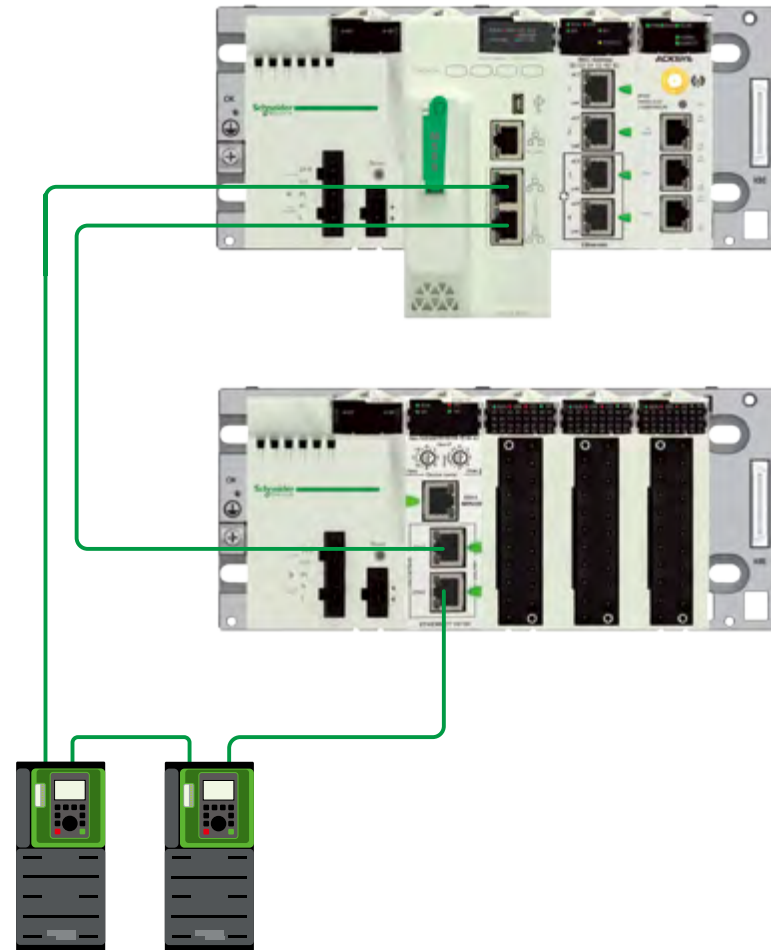
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Easily connect to fieldbus and other networks

- Simple HMI operator panel integration via third port on remote I/O head
- Interface to other popular fieldbus and device networks, including AS-Interface, Modbus, Profibus, HART, and CANopen

Drives directly integrated on Ethernet remote I/O bus

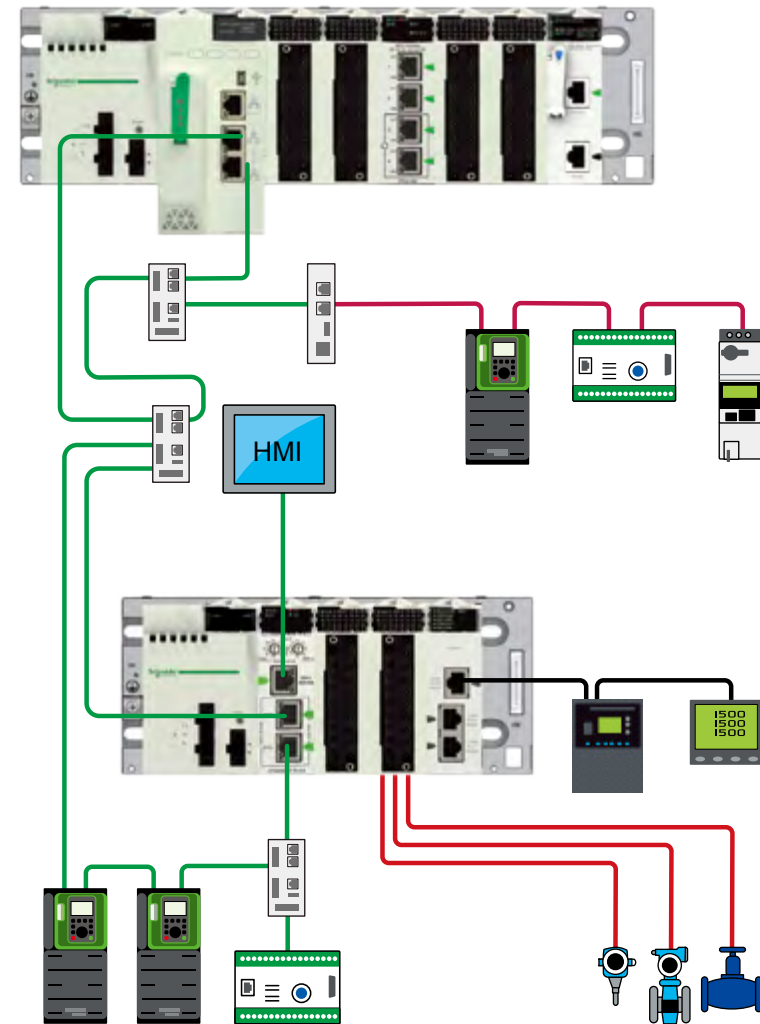
- No additional cabling cost
- High availability with self-recovery loop
- Easy integration through FDT/DTM technology
- Ready-to-use function blocks in Unity Pro platform for Altivar™ Process variable speed drives
- Easy replacement with drive configuration stored in Modicon M580



Fully integrated plant control architecture

Interconnect your equipment with flexibility:

- Ethernet remote I/O drops
- Drives on Ethernet RIO
- Distributed I/O
- HART module
- Gateway for fieldbus on Ethernet RIO
- Devices on Ethernet services ports



Greater agility for your operations

The Modicon M580 ePAC supports the agile development methodology, where you can adapt your applications and architecture incrementally for immediate results. This not only reduces downtime but also ensures higher process quality.

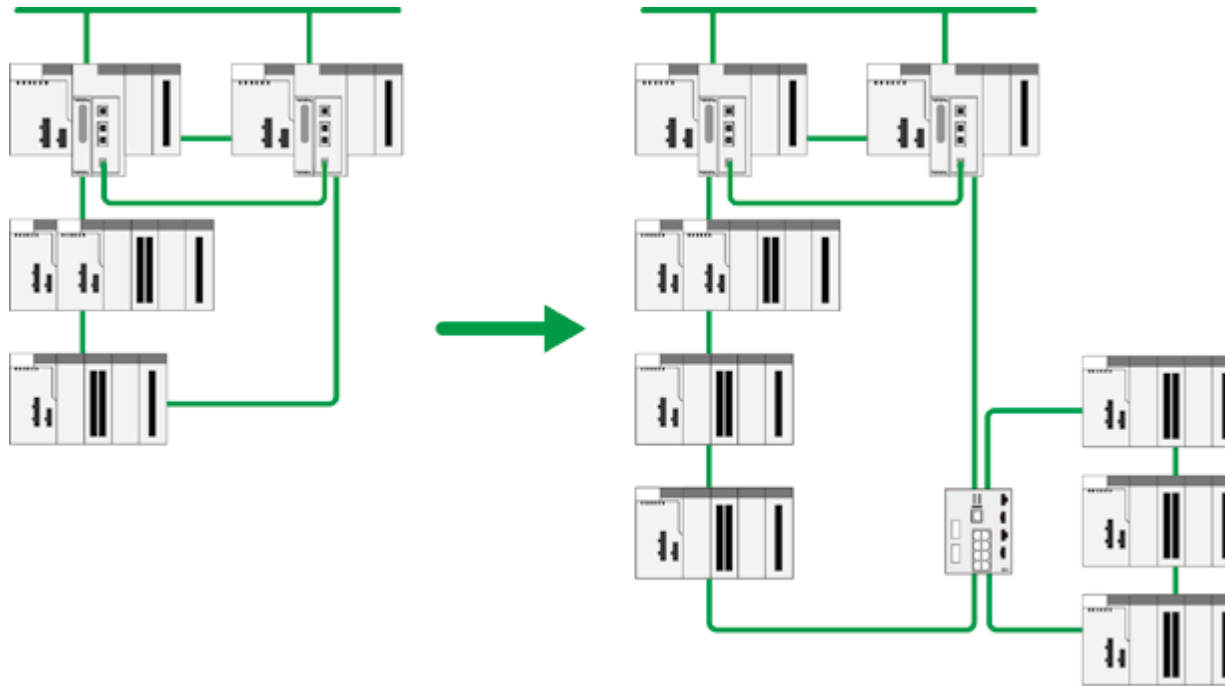
Perform live updates while the process is running — with change configuration on the fly

- Add new RIO drops or new modules in the architecture
- Hotswap your modules — with automatic reconfiguration
- Modify channel configuration parameters
- Modify application or change variables



Reduce downtime with a wide set of CCOTF features

Evolve and scale your architectures without stopping the process



Seamless integration from the field
to enterprise levels

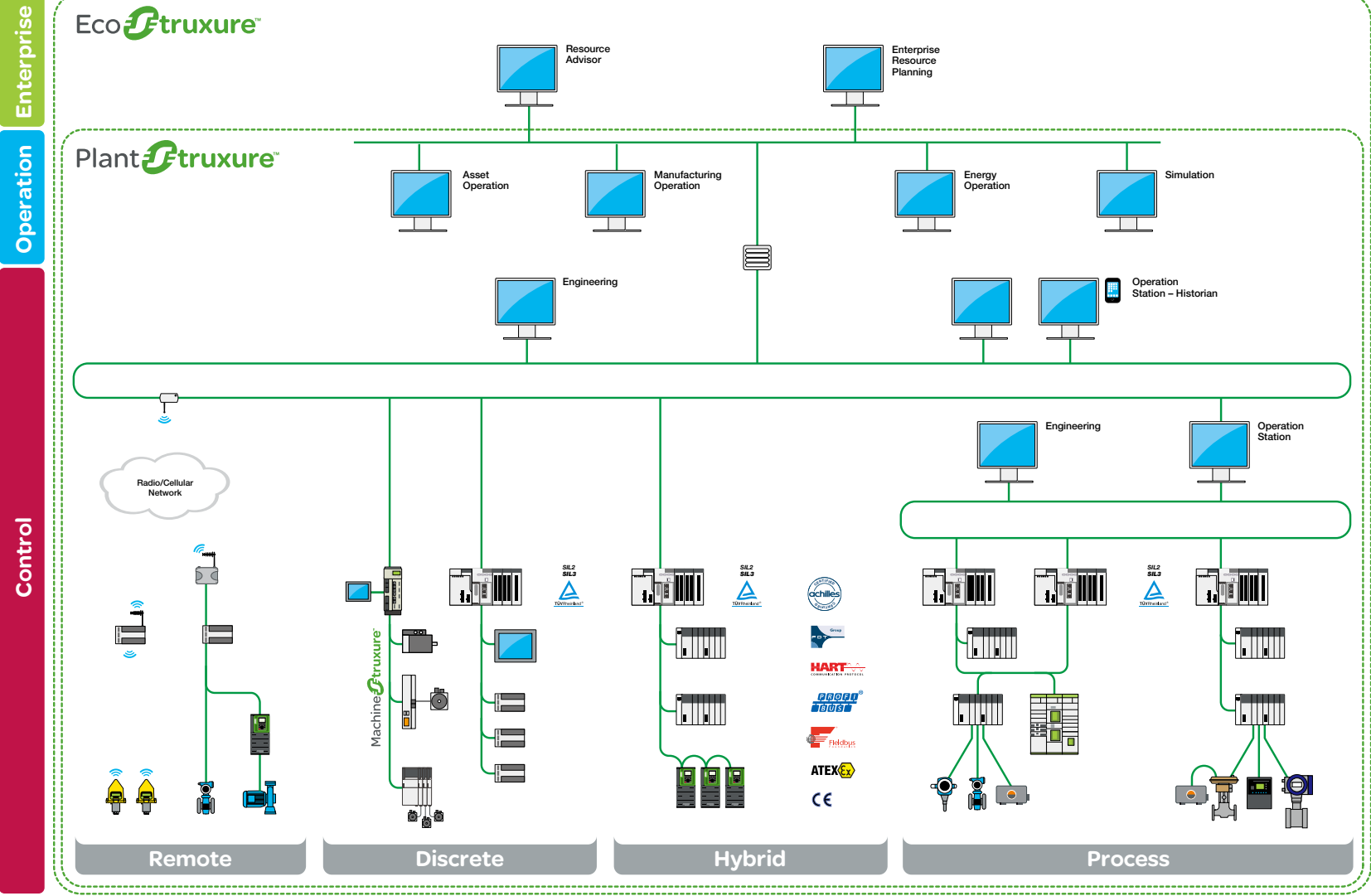
Modicon M580, the high-end integrated controller for PlantStruxure

PlantStruxure is Schneider Electric's integrated automation architecture that transparently connects the control, operation, and enterprise levels of your business.

As a key component of PlantStruxure, the Modicon M580 ePAC 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 insight into alarms and events
- Rapidly diagnose and identify root causes of issues
- Make informed decisions about plant operations and energy management

PlantStruxure architecture



Native integration with best-in-class SCADA supervision systems

Modicon M580 integrates seamlessly with best-in-class SCADA software, including Wonderware and StruxureWare SCADA Expert Vijeo Citect.

This native integration allows operators to handle process disturbances efficiently and without delay, thanks to:

- Optimized configuration for high-speed communication and better response time
- Online modification or configuration of Modicon M580 all within the SCADA system
- Direct view of controller alarms within the SCADA interface
- Visibility to all process data and field devices from SCADA level
- Native diagnostic of the entire control system embedded in SCADA

PlantStruxure PES, powered by the Modicon M580

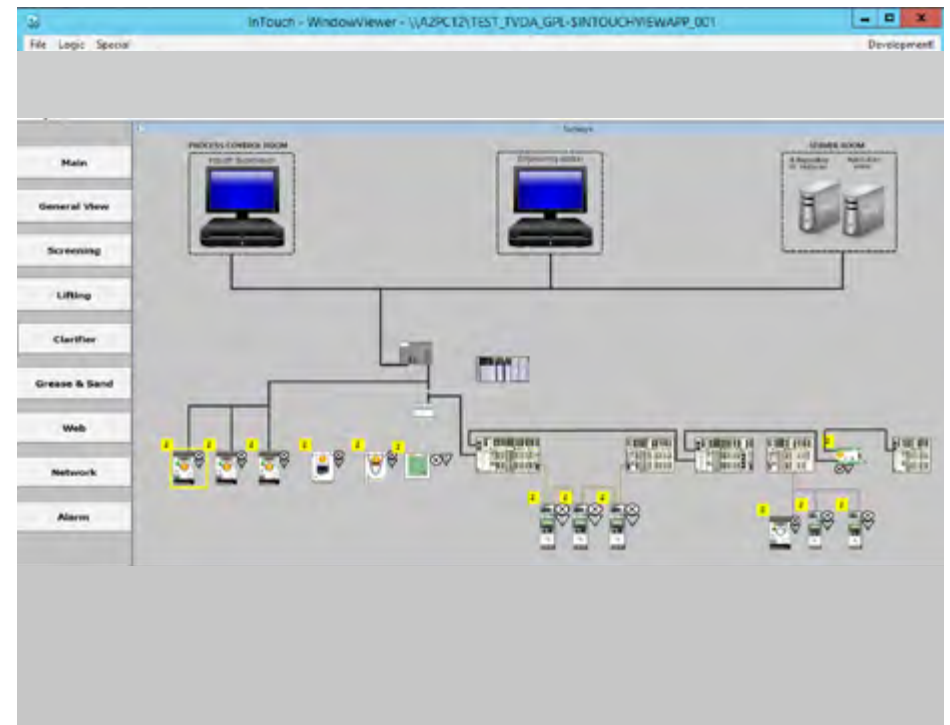
PlantStruxure PES, the innovative process automation system (PAS) brings together the advantages of both PLC and distributed control system (DCS) worlds.

PlantStruxure PES powered by Modicon M580 for running your control strategy combines the ease and openness of PLC/SCADA with the integration, single database, and powerful diagnostics of a traditional DCS.

The result? An innovative and energy-aware PAS that meets the demands of modern production facilities with optimal use of energy resources. All your key process functionalities seamlessly integrated in one environment.



Wonderware System Platform



Faster time-to-market and enhanced operational efficiency, thanks to:

- Reduced risk, improved process uptime, reduced loss of production

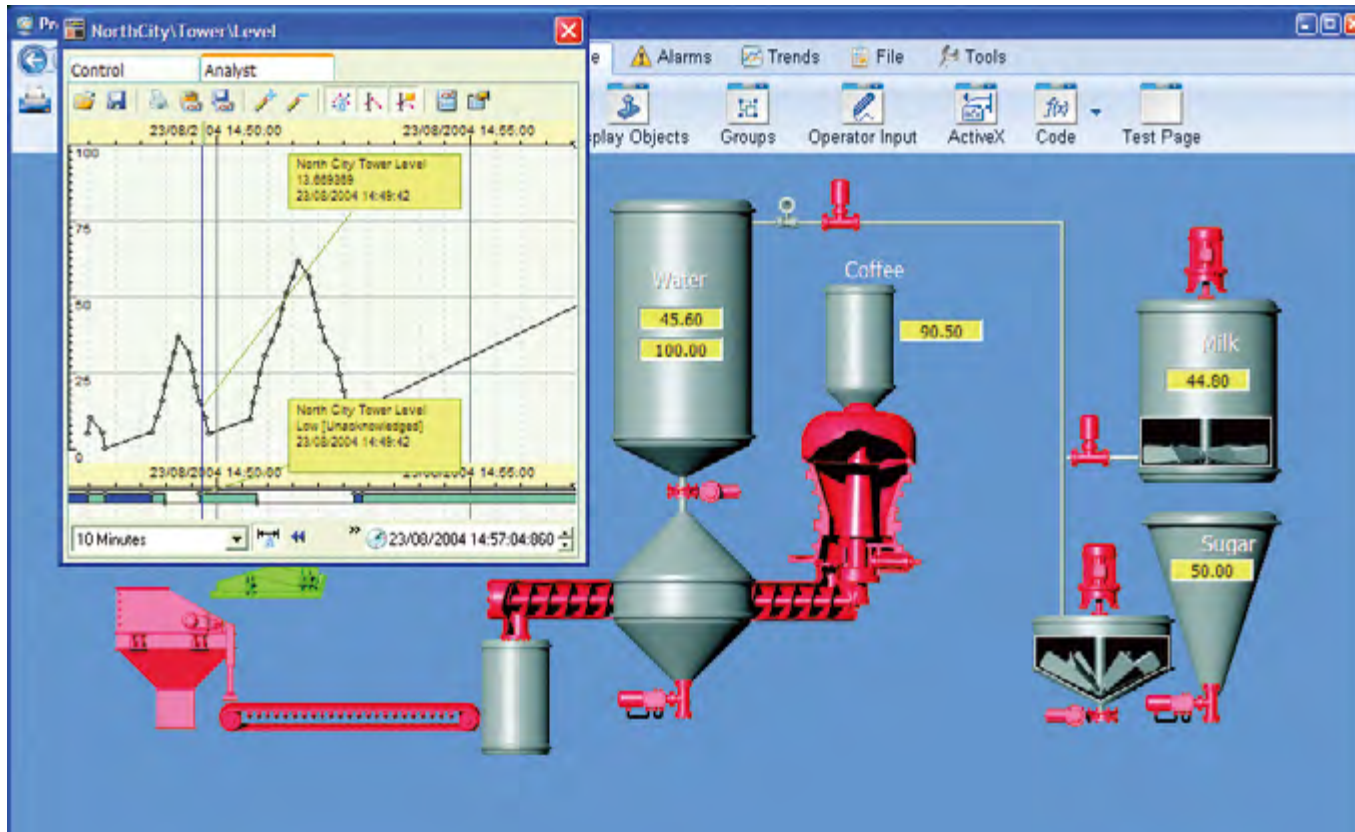
Key features include:

- Seamless integration with Modicon M580 thanks to Open Platform Communications (OPC)
- Ready-to-use, out-of-the-box function blocks and faceplates
- Situational awareness functionality



by Schneider Electric

StruxureWare SCADA Expert Vijeo Citect platform



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Key features include:

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Greater energy efficiency with Altivar Process drives

The combination of Modicon M580 and Schneider Electric's Altivar Process variable speed drives results in a truly productive, efficient, and energy-aware process.

- Altivar Process provides dual Ethernet daisy chain ports and high availability
- DTM integrated for Unity Pro FDT container, allowing easy access to your equipment's data without developing a special user interface
- Dedicated object libraries, embedded commissioning tools, and predictive/preventive diagnostic simplify the configuration and maintenance of automation assets
- The embedded energy measurement functions in Altivar Process allow you to easily monitor the energy performance of your more demanding assets (motors, pumps, fans), helping optimize the overall energy efficiency of your process

Altivar Process variable speed drives

Altivar Process variable speed drive delivers top performance that exceeds expectations. It optimizes business performance in both utility and industrial processes through:

- Energy management
- Asset management
- Real time intelligence



From 0.75 kW to 800 kW

- Altivar 600 for fluid management
- Altivar 900 for demanding applications

Smart migration to protect
your legacy investment

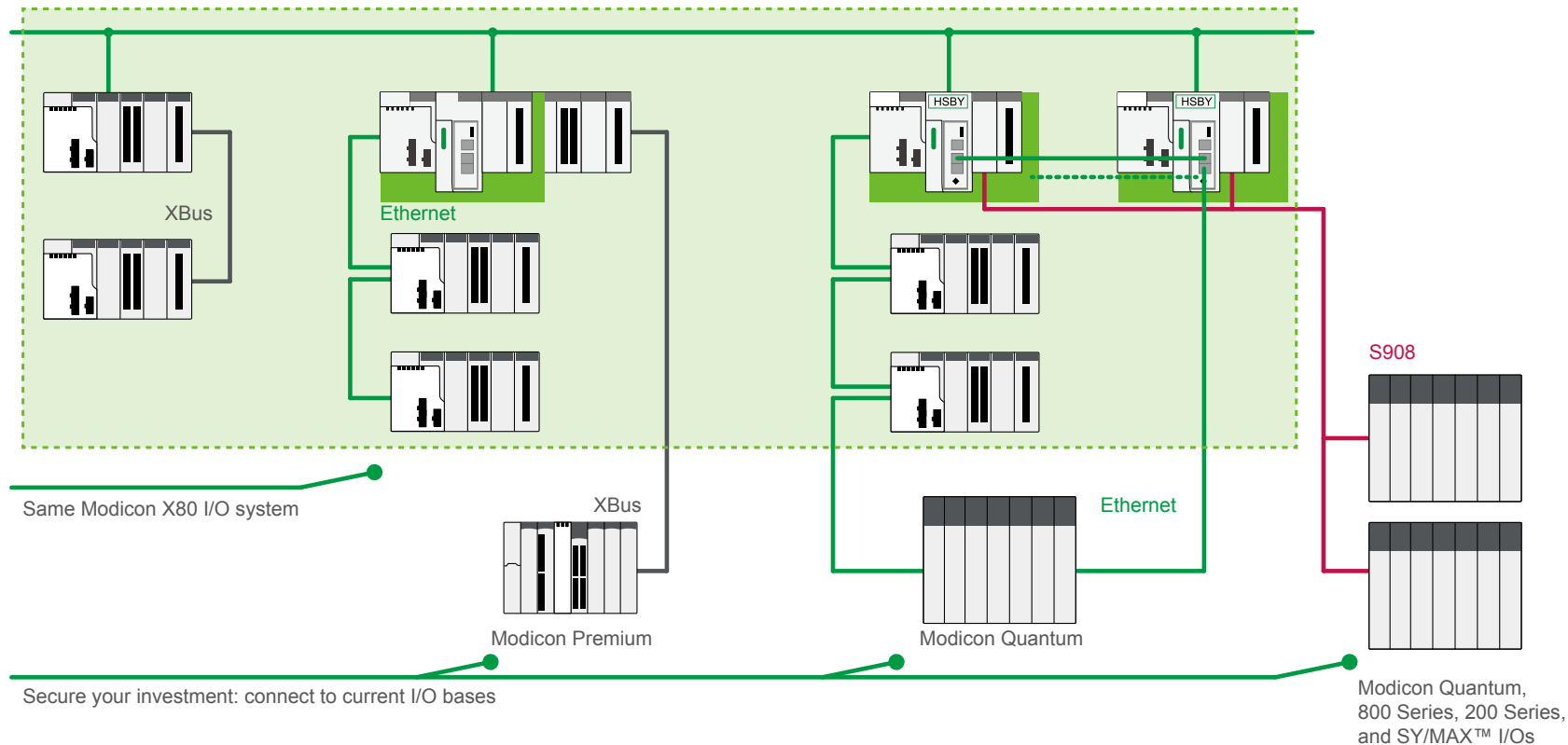


Smart migration solutions to protect your hardware investment

Schneider Electric supports you with technical expertise and services to ensure a smooth transition to newer technology. Our migration solutions let you:

- Standardize on the Modicon family with common Modicon X80 modules
- Reduce training and maintenance costs
- Keep your existing Modicon Premium I/O or Quantum I/O and wiring
- Upgrade smoothly with migration paths for both hardware and software
- Adjust your process quickly to changing market demands thanks to dedicated service ports and migration services

Sustainable I/O management thanks to backward compatibility



- Migrate to Modicon M580 easily by removing CPUs and remote drop adapters
- Unity Pro includes standard software converters for PL7 programs
- Our field services experts are able to provide you with a full plan for migration without stopping your application

Capitalize on the Unity Pro platform

Unity Pro is the single software to unify the management of your Modicon controllers. Unity Pro employs standard FDT/DTM technology, simplifying the integration of field devices. Furthermore, you can migrate your developed programs to Modicon M580 without recoding.



Capitalize on the Unity Pro platform

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Reduce engineering and deployment time

- Pre-developed process, signal conditioning, device configuration, and communication blocks for building new application logic
- Pre-tested and validated function blocks components
- Diagnosis objects, providing diagnostic information of the controllers
- Simulation feature for conducting actual field conditions and testing before deployment

Capitalize on the Unity Pro platform

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Simplify your operations

- CCOTF features let you maintain and update your installation without stopping the process
- Animation tables (recipes), operator screens, and trending tool allow easy process maintenance with a single software
- Modicon M580 Web server lets you perform diagnosis from tablets and smartphones
- Access to diagnostic buffer and alarm viewer to control your process from anywhere

Unity Pro, single engineering platform software

The screenshot displays the Unity Pro XL software interface with the following components:

- Project Browser:** Shows a structural view of the project, including EIO Bus, Derived Data Types, Derived FB Types, Variables & FB Instances, Motion, Communication, Ethernet Network, Program, Tasks, and MAST.
- Table[test : [MAST]]:** A table listing variables with their values and types:

Name	Value	Type	Comment
my_pump1_speed	500	DINT	
launch_process	1	BOOL	
close_door	1	BOOL	
control_valve	0	DINT	
- Data Editor:** A table listing variables with their types and addresses:

Name	Type	Address
close_door	BOOL	
control_valve	DINT	
launch_process	BOOL	
my_pump1_speed	DINT	
- PLC bus:** Shows a rack configuration with modules: CPS 2000, eP58 4040, eNOC 1301, eNOC 1311, eNOC 1311, DDI 1402, and EHC 1800.
- test : [MAST] Ladder Logic:**

```
my_pump1_speed := 0;  
IF launch_process = TRUE THEN  
  close_door := TRUE;  
  my_pump1_speed := 500;  
ELSE  
  close_door := FALSE;  
  control_valve := 0;
```
- Diagnostic Viewer:** Shows system status and build information:

```
Analyzing...  
(Ethernet Network) : Global modbus and FIP network bandwidth: Input=0,02% - Output=0,04%  
Project settings disabled : Maintain output links on disabled EF [EN=0]  
[test : [MAST]] : 0 error(s), 0 warning(s)  
Generating...  
Linking...  
Process succeeded : 0 Error(s) , 0 Warning(s)
```
- Build Changes:** Shows the current build status: **Build Changes** Import/export User errors FDT log event Search/Replace
- Status Bar:** Displays system mode (HMI R/W mode), RUN, UPLOAD INFO OK, TCP/IP:127.0.0.1, MEM, BUILD, and INS.

Unity Pro is the single engineering platform, unifying the engineering, commissioning, and monitoring of your Modicon portfolio.

Best-in-class controller for the full life cycle
of your applications



Comprehensive solutions and support for system integrators

As the global specialist in energy management and automation, Schneider Electric offers comprehensive solutions and support to meet system integrators' requirements across numerous market segments.

From design through to implementation, Schneider Electric technology helps system integrators reduce time-to-market thanks to:

- A single automation platform for multiple applications
- Tested, validated, document architectures (TVDA's)
- PlantStruxure Builder tools, object-oriented programming, and libraries
- Simplified spare-part management



Water & Wastewater

- Comply with advanced cyber-security standards to protect critical infrastructure applications
- Increase operational reliability in harsh environments thanks to hardened systems
- Improve remote control with integrated RTU communications based on telemetry protocols
- Improve operational and maintenance efficiency with advanced pump diagnostics through integration with Altivar Process variable speed drives
- Simplify management of smart devices and instruments with Ethernet and fieldbus connectivity
- Secure investments with efficient migration solutions that reuse legacy I/Os and existing cabling



Food & Beverage

- Simplify your architecture with integrated Ethernet backbone, AS-i Master modules, and weighing solution
- Install ATEX-compliant offers where applicable
- Standardize your applications for diverse processes, thanks to the large 64 MB memory
- Improve performance reliability with remote I/O synchronization
- Integrate more easily with FDT/DTM technology
- Reduce downtime with unique CCOTF features
- Store your recipes in CPUs with native 4 GB SD card
- Increase process visibility with high SCADA bandwidth
- Control from the plant floor with HMI connected to native service ports



Mining, Minerals & Metals

- Improve maintenance efficiency with change configuration on the fly
- Operate 24/7 with redundant processors and power supplies coupled with ring topology
- Protect your investment by reusing programming logic, legacy I/Os, and existing cabling
- Achieve higher performance thanks to the biggest CPU memory size on the market and faster scan time
- Evolve your architecture flexibly and cost-effectively thanks to Ethernet-based automation architectures
- Evolve your existing systems to help ensure compatibility



Hydroelectric Energy

- Enhance system reliability and availability with proven redundancy technology, superior EMC, and advanced environmental features
- Save engineering and commissioning time with TVDA hydro solution
- Reduce risk with regulation-compliant cyber-security hardened system
- Improve operational efficiency with power-dedicated features, such as time stamping and IEC communication protocol
- Simplify expansions and retrofits thanks to backwards compatibility with legacy Modicon ranges



Oil & Gas

- Improve security with native cyber-security features
- Operate 24/7 with redundant controllers and power supply as well as hot-swap modules
- Improve diagnostic efficiency with native HART device integration
- Speed up development with ready-to-use libraries
- Transparently support multiple Ethernet streams (video, fire/smoke detection, etc.)



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