Catalog | April 2026



Modicon M590 dPAC

Distributed Programmable Automation Controller

Powered by EcoStruxure™ Automation Expert

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Modicon

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Edge control for industrial internet of things (IoT)

Modicon IIoT-native edge controllers manage complex interfaces across assets and devices or directly into the cloud, with embedded functional safety and cybersecurity. **Modicon** provides performance and scalability for a wide range of industrial applications up to high-performance multi-axis machines and high-available redundant processes.

Explore our offer

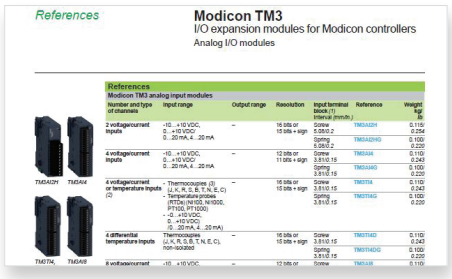
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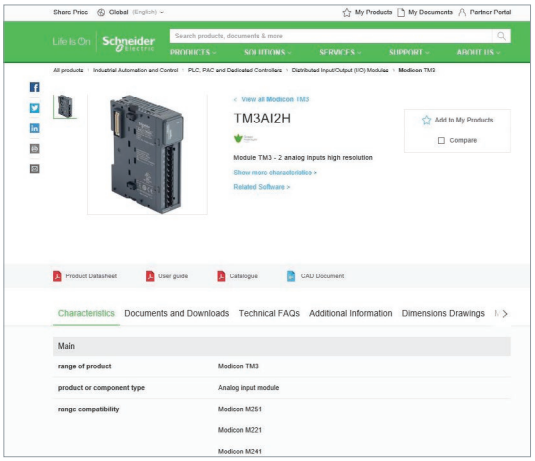
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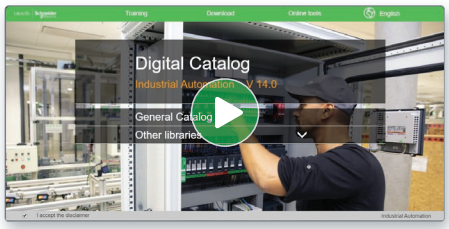


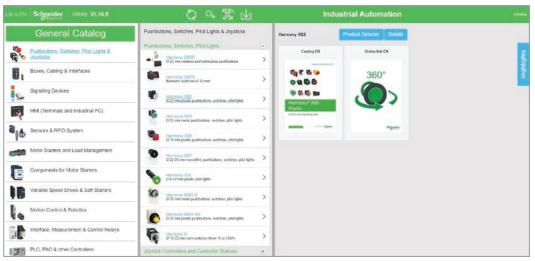


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- Product image, Instruction sheet, User guide, Product certifications, End of life manual

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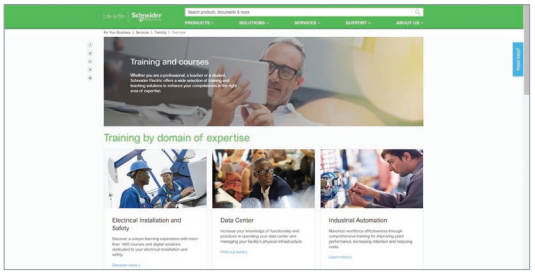


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Modicon M590 dPAC



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Modicon M590 dPAC

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Make efficient

IMPACT

with Modicon M590 dPAC



Intelligent **Powerful** **Robust**



Supports RSTP ring network



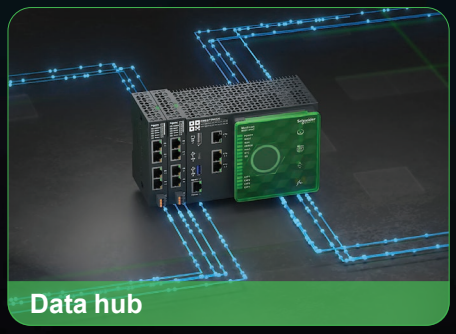
High Availability



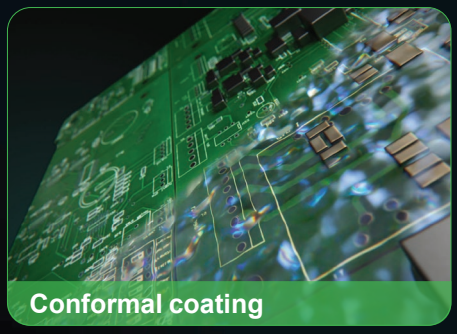
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Expandable



Data hub



Conformal coating

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Modicon M590 dPAC
Distributed Programmable Automation Controller (dPAC)

Modicon M590 dPAC – Product highlights

- Versatile architecture
- High system reliability
- Rapid network recovery
- Flexible connectivity
- Scalable network design
- High-availability architecture
- Ecostruxure integration

Modicon M590 dPAC – Distributed Programmable Automation Controller

The Modicon M590 dPAC is a next-generation distributed programmable automation controller designed to meet the evolving demands of modern industrial environments. Engineered for performance, scalability, and reliability, it empowers businesses to streamline operations, enhance connectivity, and provide continuous control across diverse applications.



Purpose

The M590 dPAC serves as the central brain of industrial automation systems, managing and coordinating processes with precision and speed. It is ideal for industries requiring high-availability, robust communication, and seamless integration with existing infrastructure.

Certifications and standards

All Modicon M590 dPAC controllers have received a CE certificate, which means they comply with the strict industrial safety, quality, and performance standards required for industrial automation systems.

These certifications validate the controllers' reliability in diverse operational environments, including those with high electrical noise, temperature variations, and demanding industrial safety requirements. As a result, users can confidently deploy M590 dPAC in global markets, knowing they adhere to recognized regulatory frameworks and industry best practices.

Market segments

The Modicon M590 dPAC controllers and modules are designed to meet the requirements of the following vertical segments:

Water & Waste Water

Discrete manufacturing

Consumer Packaged Goods

Data centers

Treatment for harsh chemical environments

The use of contact grease protection on connectors and removal terminal blocks is mandatory to meet these requirements.

The lubricant protection seals electrical contacts from oxygen, moisture, aggressive gasses, and other hostile elements.

- IEC/EN 60721-3-3 class 3C1, 3C2, 3C3, 3C4:
  - > 7 days; 25 °C/*77 °F* relative humidity 75%
  - > Concentrations (ppb): H2S: 9,900/SO2: 4,800/Cl2: 200
- IEC/EN 60068-2-52 salt mist, Kb test severity level 2:
  - > 3x 24-hour cycles
  - > 5% NaCl
  - > 40 °C/*104 °F* relative humidity 93%

Selection guide

Modicon M590 dPAC

Distributed Programmable Automation Controller (dPAC)

Device type		Processors	
			
Controller type		Standard standalone controller	Advanced standalone controller
Communication port	Service network	1x RJ45 (10M/100M/1000M)	
	Device network	2x RJ45 (10M/100M/1000M), supports RSTP ring	
	High-availability port	-	
	Serial communication	1x RJ45/RS232/RS485 (switching by software)	
	USB	1x Type-C + 1x Type-A	
	DisplayPort	Yes	
Memory	RAM	8GB	
	Data storage	128GB	
	Persistent data	Yes	
	ECC	Yes	
Device interface	Left expansion module	–	Maximum 2x BMENOC0301
	Removable storage	Micro SD card slot, max. 128GB	
	Battery	Battery for RTC, pluggable battery holder, battery type: MAXELL CR2032H	
Software	Engineering software	EcoStruxure™ Automation Expert version 25.0.1 and higher	
	Communication protocol	Modbus TCP, Modbus RTU, OPC UA, MQTT, Open TCP/IP	
	Real-time clock	Yes, power supply from battery during power outage	
	HMI RT	Yes	
	High-availability	–	
	Data hub	No	Yes
Cybersecurity		Secure boot, firmware signing, OS hardening, communication robustness, secure communication (HTTPS), security logging	
Physical characteristics	Dimensions (W x H x D mm/*in.*)	160 x 114 x 102/*6.29 x 4.48 x 4.01*	
	Weight (kg/*lb*)	0.895/*1.97*	
	Installation method	Top hat type TH35-7.5 rail IEC 60715	
Indicators	LEDs	Power, system diagnostics, controller status (Ring LED)	
Power supply	Rated voltage	24 VDC	
	Voltage range	20.4…28.8 VDC	
	Power connector	Push-in spring terminal block	
Operating environment	Operating temperature	0...60 °C/*32...140 °F*	-20...60 °C/*-4...140 °F*
	Operating altitude	0...2,000 m *(0...6,560 ft)*	
	Relative humidity	5...95% (non-condensing)	
	Protection rating	IP20	
	Impregnation material	Conformal coated	
	Vibration resistance	3 gn	
	Mechanical shock resistance	30 gn	
Reliability	MTBF	341222 H	
Certification		CE	
References		**BMEDP592020**	**BMEDP594020**

(1) Available from Q3 2026.

Processors		Network module
		 Coming soon
Standard HA redundant controller	Advanced HA redundant controller	–
1x RJ45 (10M/100M/1000M)		2x RJ45 (10M/100M/1000M)
2x RJ45 (10M/100M/1000M), supports RSTP ring		2x RJ45 (10M/100M/1000M), supports RSTP ring
1x SFP slot		–
–		–
1x Type-C		–
–		–
8GB		–
128GB		–
Yes		–
Yes		–
–	Maximum 2x BMENOC0301	–
Micro SD card slot, max. 128GB		–
Battery for RTC, pluggable battery holder, battery type: MAXELL CR2032H		–
EcoStruxure™ Automation Expert version 25.0.1 and higher		–
Modbus TCP, Modbus RTU, OPC UA, MQTT, Open TCP/IP		–
Yes, power supply from battery during power outage		–
–		–
Yes		–
No		–
Secure boot, firmware signing, OS hardening, communication robustness, secure communication (HTTPS), security logging		–
160 x 114 x 102/*6.29 x 4.48 x 4.01*		22 x 110 x 96/*0.87 x 4.33 x 3.78*
0.889/*1.96*		0.121/*0.267*
Top hat type TH35-7.5 rail IEC 60715		Top hat type TH35-7.5 rail IEC 60715
Power, system diagnostics, controller status (Ring LED)		Power, system diagnostics
24 VDC		24 VDC
20.4…28.8 VDC		20.4…28.8 VDC
Push-in spring terminal block		Push-in spring terminal block
0...60 °C/*32...140 °F*	-20...60 °C/*-4...140 °F*	-20...60 °C/*-4...140 °F*
0...2,000 m *(0 ... 6,560 ft)*		0...2,000 m *(0 ... 6,560 ft)*
5...95% (non-condensing)		5...95% (non-condensing)
IP20		IP20
Conformal coated		Conformal coated
3 gn		3 gn
30 gn		30 gn
343569 H		–
CE		CE
BMEDH592020	**BMEDH594020**	**BMENOC0301** *(1)*

Modicon M590 dPAC

Distributed Programmable Automation Controller (dPAC)



Standalone controller



HA redundant controller



Network expansion module

The Modicon M590 distributed Programmable Automation Controller (dPAC) delivers exceptional performance across a wide range of industrial applications.

Features

According to different application scenarios, Modicon M590 dPAC can provide three types of device: standalone controller, HA redundant controller, and network expansion module:

- The **standalone controller** has rich interfaces and offers versatile connectivity to seamlessly integrate with diverse devices.
- The **HA redundant controller** delivers powerful performance, and multiple HA redundant controllers form high-availability control system, which helps to ensure maximum uptime and operational continuity.
- The **network expansion** module is used to boost the network performance and scalability of the controller.

To cope with various complex working conditions, Modicon M590 dPAC is engineered for superior reliability in demanding environments:

- HA redundant controllers can build high-availability control systems.
- The controller and expansion module have an RSTP interface. Enabling the RSTP function allows the system to recover quickly from detected network failures.
- Data persistence function during power outage.
- Real-time clock enables precise event tracking and insightful diagnostics.
- ECC memory improves reliability by detecting and correcting random access memory errors.

Utilities

- **Versatile architecture**: Available in standalone, HA redundant, and network expansion configurations to suit various operational needs.
- **High-availability**: HA redundant controllers provide uninterrupted control, minimizing downtime in mission-critical applications.
- **Advanced connectivity**: Supports Ethernet, RS232/RS485, USB, and Display Port interfaces for flexible device integration.
- **Scalable networking**: Expandable up to six LAN ports with support for RSTP ring networks, enabling resilient and efficient communication.
- **EcoStruxure™ integration**: Seamlessly integrates with Schneider Electric's EcoStruxure Automation Expert platform for enhanced HMI/SCADA capabilities.
- **Robust reliable performance**: Features ECC memory, real-time clock, and data persistence during power loss for dependable operation in harsh environments.

Whether you're optimizing a single process or managing a complex automation network, the Modicon M590 dPAC delivers the intelligence and adaptability needed to drive industrial success.

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Modicon M590 dPAC

Distributed Programmable Automation Controller (dPAC)

EcoStruxure™ Automation Expert

Feature overview

EcoStruxure Automation Expert represents a software-defined approach to designing, building, operating, and maintaining industrial automation systems that offers a unique technology mix.

Complexity mastered

Systems, devices, services, and assets are natively represented as ready-to-use software objects called composite automation types (CATs) that encapsulate internal behaviour and simplify functional interfaces. An object-oriented approach promotes code reuse enabling standardization on industrial best practice, and helps manage complexity while providing the fundamental building blocks for the creation of cyber-physical systems. CAT objects follow a type/instance relation and can be combined to create new objects that encapsulate:

- Control logic
- HMI/SCADA visualization
- I/O and device communications
- Simulation and test rigging
- Documentation

Decoupling the application from implementation

EcoStruxure Automation Expert allows engineers to generate their automation control strategies without the need for the hardware architecture, by decoupling the application from the runtime deployment. This allows professionals to focus independently on each task throughout the project lifecycle, combining the optimum capabilities of classic PLCs with DCS control approaches. Applications are portable, reusable, and interoperable across runtime platforms, meaning deployment decisions are made just in time and on the fly, enabling exceptional system agility.

Efficient engineering

EcoStruxure Automation Expert Build Time provides a single, modular engineering environment for all tasks needed to engineer, monitor, and manage the complete automation system including hardware and software, control, and visualization. It automates low value engineering and integration tasks, reducing engineering effort and sources of error by leveraging Asset Link to perform digital engineering. Complex functions can be encapsulated into manageable objects, enabling non-technical users to understand and manage complex systems.

Cross communications are transparent and implicit regardless of physical location, requiring zero engineering consideration.

Common runtime environment

Through the implementation of the shared source Runtime engine provided by universalautomation.org across hardware and software platforms, exceptional re-usability, scalability, and architectural flexibility are now available. Application portability provides cost savings through the decoupling of the lifecycles of software and hardware systems.

Simple system integration

EcoStruxure Automation Expert was designed with the complete lifecycle of an automation system in mind, with functions to facilitate management and monitoring of multiple assets and devices at scale. With a single user environment covering the entire system scope including third-party devices, orchestration of complex, heterogenous systems becomes simpler.

Native IT integration

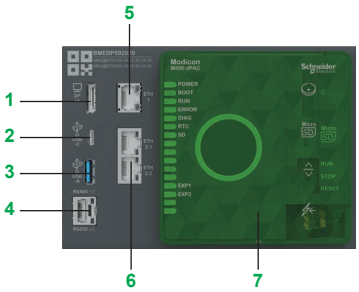
Modern automation systems generate increased value when coupled with business information and hence wider IT ecosystems. EcoStruxure Automation Expert provides an expandable platform for Industry 4.0 solutions with support for high-level programming, modular systems design, and open standards. Thanks to event-driven execution and object-oriented design, EcoStruxure Automation Expert applies to IT programming language standards.

Cybersecurity

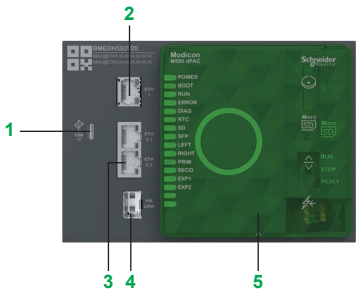
EcoStruxure Automation Expert includes robust support for cybersecurity including credential management and secure communications. User and device credentials are managed by the EcoStruxure Automation Expert Build Time environment, and secure communications are available between controllers, HMI, SCADA, and third-party devices.

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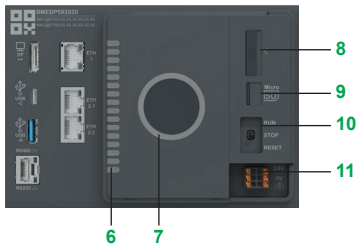
Modicon M590 dPAC
Distributed Programmable Automation Controller (dPAC)



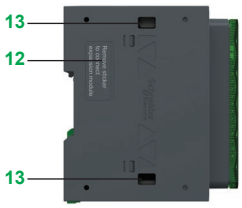
Front view of standalone controller



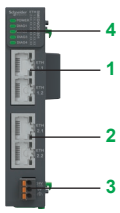
Front view of HA redundant controller



Controller with transparent cover opened



Left side view of the standalone and HA redundant controller



Front view of expansion module

Description of controllers

Front view of standalone controller

1 1x DisplayPort (DP)
2 1x USB Type-C port
3 1x USB Type-A port
4 1x RJ45 serial communication port, RS485/RS232, with port LED
5 1x RJ45 Ethernet 1 port, with port LED
6 2x RJ45 Ethernet 2 ports, with port LED
7 Green transparent cover

Front view of HA redundant controller

1 1x USB Type-C port
2 1x RJ45 Ethernet 1 port, with port LED
3 2x RJ45 Ethernet 2 ports, with port LED
4 1x SFP slot for HA link
5 Green transparent cover

Controller with transparent cover opened

6 System diagnostics LEDs (to indicate the real-time status)
7 Ring LED (to indicate the controller status)
8 RTC battery holder
9 Micro SD card slot
10 RUN/STOP/RESET switch
11 Power connector

Left side view of the standalone and HA redundant controller

12 Left expansion module interface
13 Left expansion module lock hole

Description of expansion module

1 2x RJ45 Ethernet 1 ports, with port LED
2 2x RJ45 Ethernet 2 ports, with port LED
3 Power connector
4 System diagnostics LEDs

Modicon M590 dPAC
Distributed Programmable Automation Controller (dPAC)



BMEDP592020 and BMEDP594020



BMEDH592020 and BMEDH594020

Modicon M590 dPAC processors

Controller type	Device ports	Network communication	High availability	Reference	Weight kg/*lb*
Standalone	• DisplayPort • USB Type-A port • USB Type-C port • Ethernet 1 port • Ethernet 2 ports • Serial communication port	• Service LAN and device LAN (supports RSTP ring)	No	BMEDP592020 BMEDP594020	1.03/*2.27*
HA redundant	• USB Type-C port • Ethernet 1 port • Ethernet 2 ports • SFP slot	• Service LAN and device LAN (supports RSTP ring) • SFP slot for HA link	Yes	BMEDH592020 BMEDH594020	1.03/*2.24*



BMEDNOC0301

Modicon M590 dPAC expansion module

Description	Network port	Reference	Weight kg/*lb*
Standalone	• 2x Ethernet ports for ring device network • 2x Ethernet ports for control network	BMEDNOC0301 *(1)*	1.03/*2.27*



TCSECE3M3M1S4

EIA/TIA 568 shielded twisted pair cables for CE market

Description	Connectors	Cable grade	Length	Reference	Weight g/*lb*
Straight-through copper cables, CE-compatible	• 2x RJ45 connectors • For connection to terminal equipment (DTE)	Rugged	1 m	TCSECE3M3M1S4	90/*0.19*
			2 m	TCSECE3M3M2S4	130/*0.28*
			3 m	TCSECE3M3M3S4	198/*0.43*
			5 m	TCSECE3M3M5S4	*274/0.60*
			10 m	TCSECE3M3M10S4	510/*1.12*



490NAC0100

Accessories

Description	Compatible with	Reference	Weight g/*lb*
SFP RJ45 module	HA redundant processors	490NAC0100	58/*0.127*
SFP fiber optical single mode module		490NAC0201	55/*0.121*

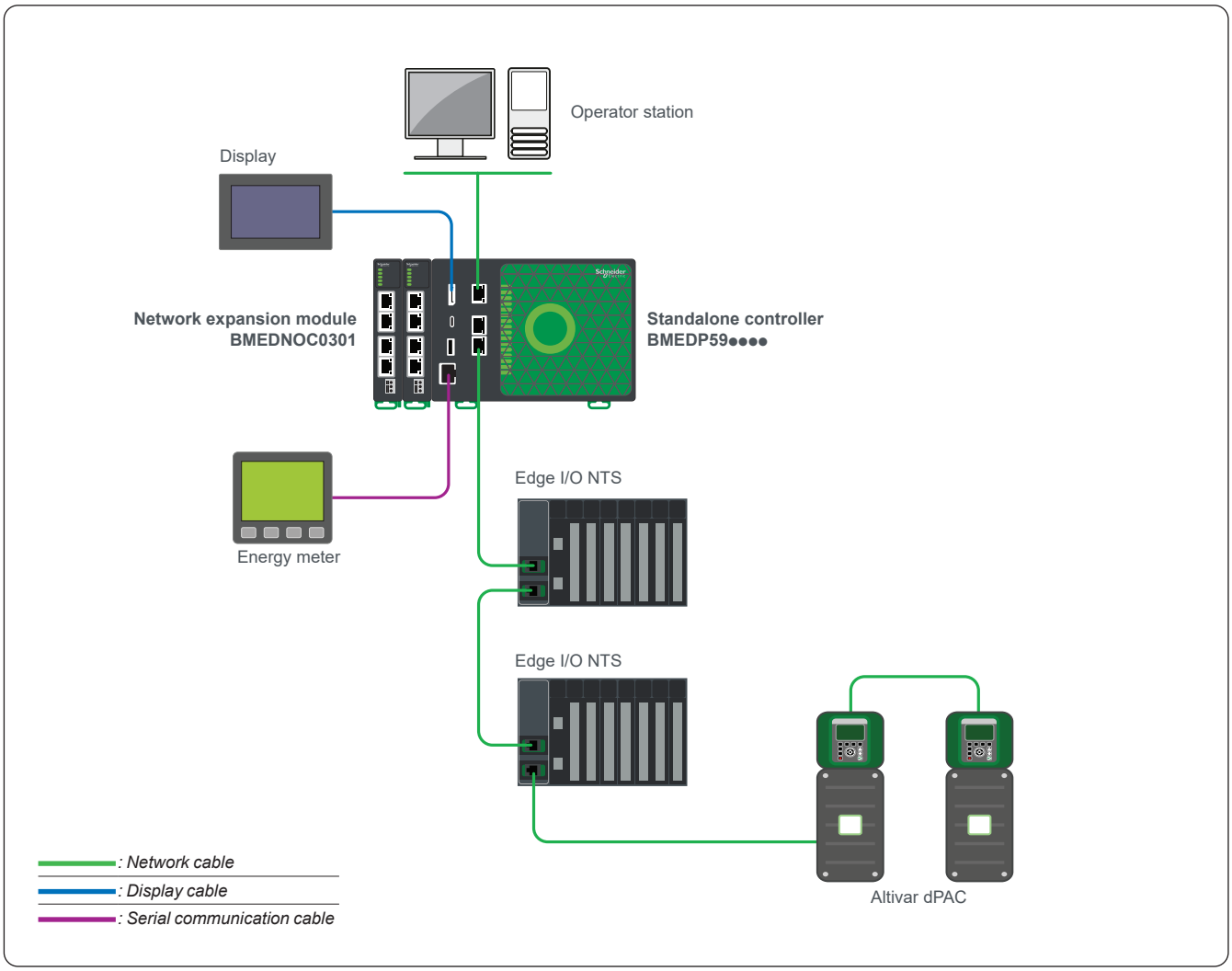
(1) Available from Q3 2026.

Modicon M590 dPAC
Distributed Programmable Automation Controller (dPAC)
Architecture – Standalone

Modicon M590 dPAC standalone controller connection architecture

The standalone controller has multiple types of interface.

- The Ethernet interface used for service functions can exchange information and data with operator stations, engineer stations, or monitoring systems.
- The Ethernet interface used for device functions can connect network devices such as I/O stations and frequency converters.
- A standalone controller can be connected to a display device with a DisplayPort.
- EcoStruxure Automation Expert integrates HMI/SCADA functions, and the controller's USB Type-C interface can connect to general HMI devices without the need for dedicated ones.
- The controller's serial communication interface can directly communicate with RS232 or RS485 devices, such as instruments and meters.
- If Ethernet communication capability needs to be enhanced, up to two network expansion modules can be added.



Example of Modicon M590 dPAC standalone controller connection architecture

Modicon M590 dPAC

Distributed Programmable Automation Controller (dPAC)

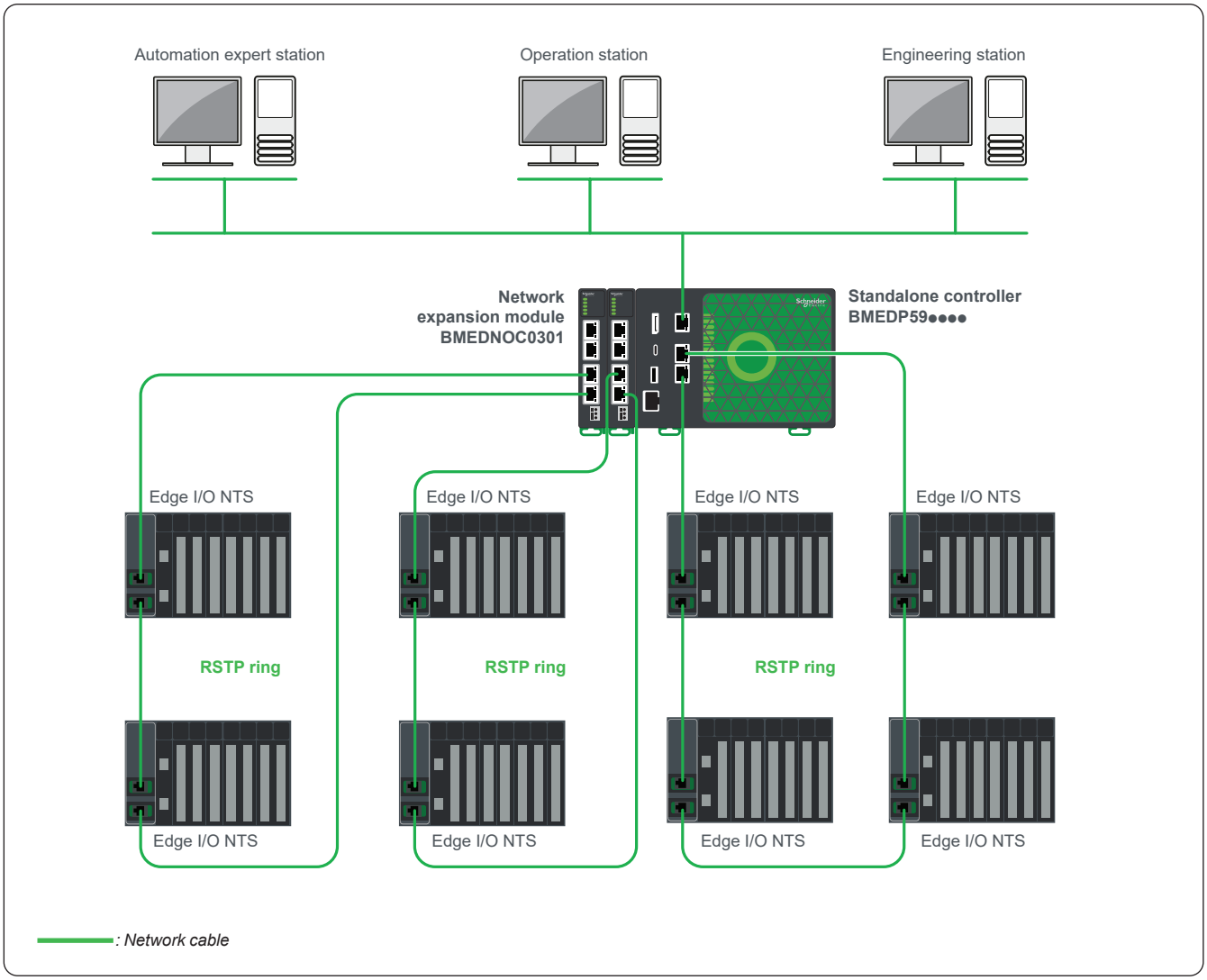
Architecture – Standalone

Modicon M590 dPAC standalone controller network architecture

The standalone controller has two LAN ports and can be expanded by up to two network expansion modules, BMEDNOC0301.

- The ETH2 interface of the controller supports the RSTP ring network.
- Each network expansion module has two LANs; the ETH2 interface supports RSTP ring networks.

After adding two network expansion modules to the standalone controller, it can support up to six LANs, and three LANs can configure a RSTP ring network.



Example of Modicon M590 dPAC standalone controller network architecture

Modicon M590 dPAC

Distributed Programmable Automation Controller (dPAC)

Architecture – High-availability

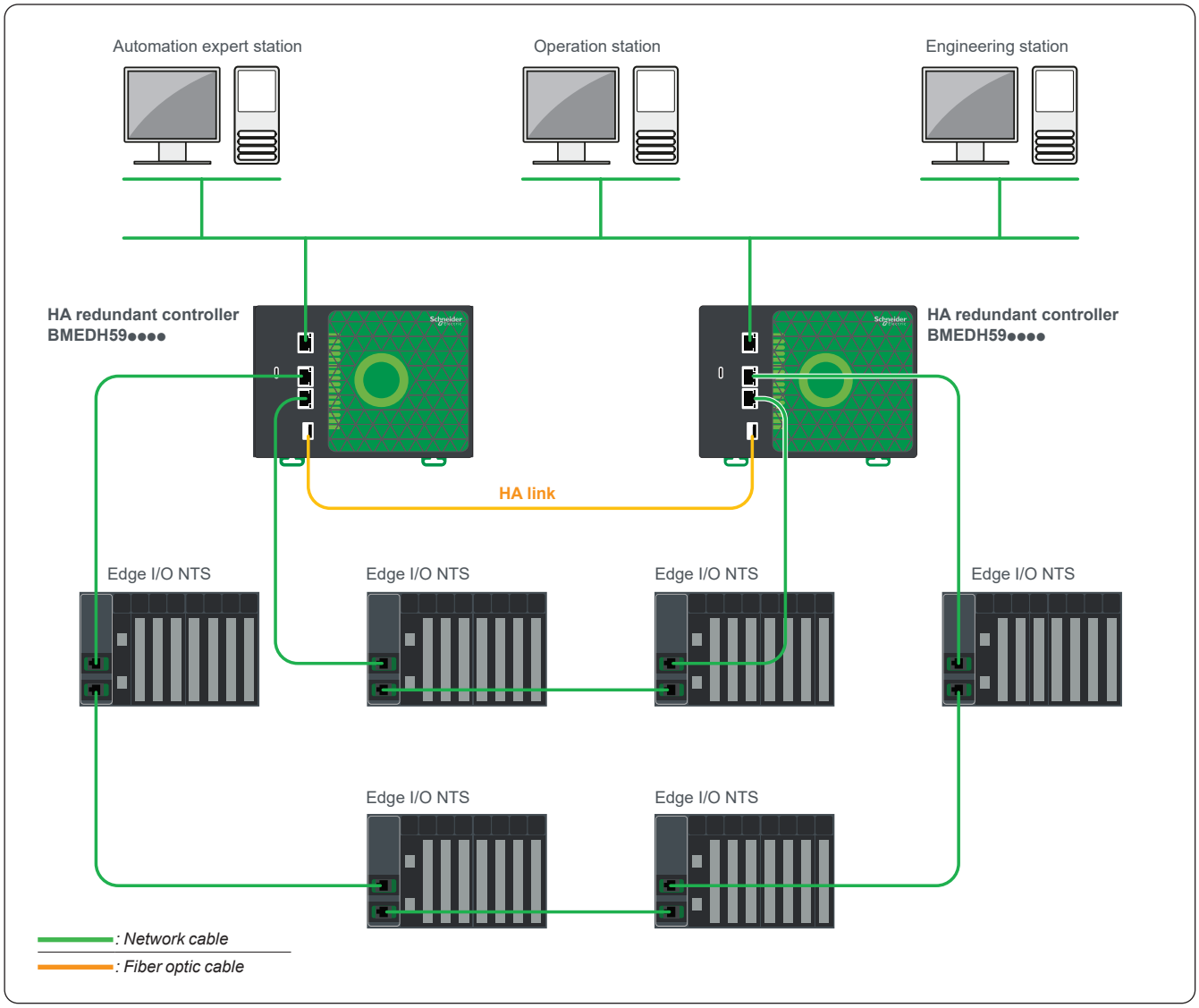
Modicon M590 dPAC high-availability architecture

High-availability effectively minimizes process downtime, making it ideal for critical applications requiring uninterrupted process flows.

The high-availability configuration comprises two Modicon M590 dPACs configured to run in a pair where one instance (partner) drives the process while the other partner is ready to take over control if the first one stops working.

Both partners check each other's availability by communicating over two links:

- The HA redundant controller has two LANs. ETH1 is the service interface, and ETH2 is the device ring network interface (similar to a standalone controller).
- The HA redundant controller's HA link interface is an SFP slot, which can be connected to the HA link interfaces of two HA redundant controllers through a dedicated cable to achieve a high-availability architecture.
- Two HA redundant controllers serve as backup for each other and are connected to the same devices, so their respective LANs have the same network architecture.



Example of Modicon M590 dPAC high-availability architecture

Modicon M590 dPAC
Distributed Programmable Automation Controller (dPAC)
Architecture – High-availability

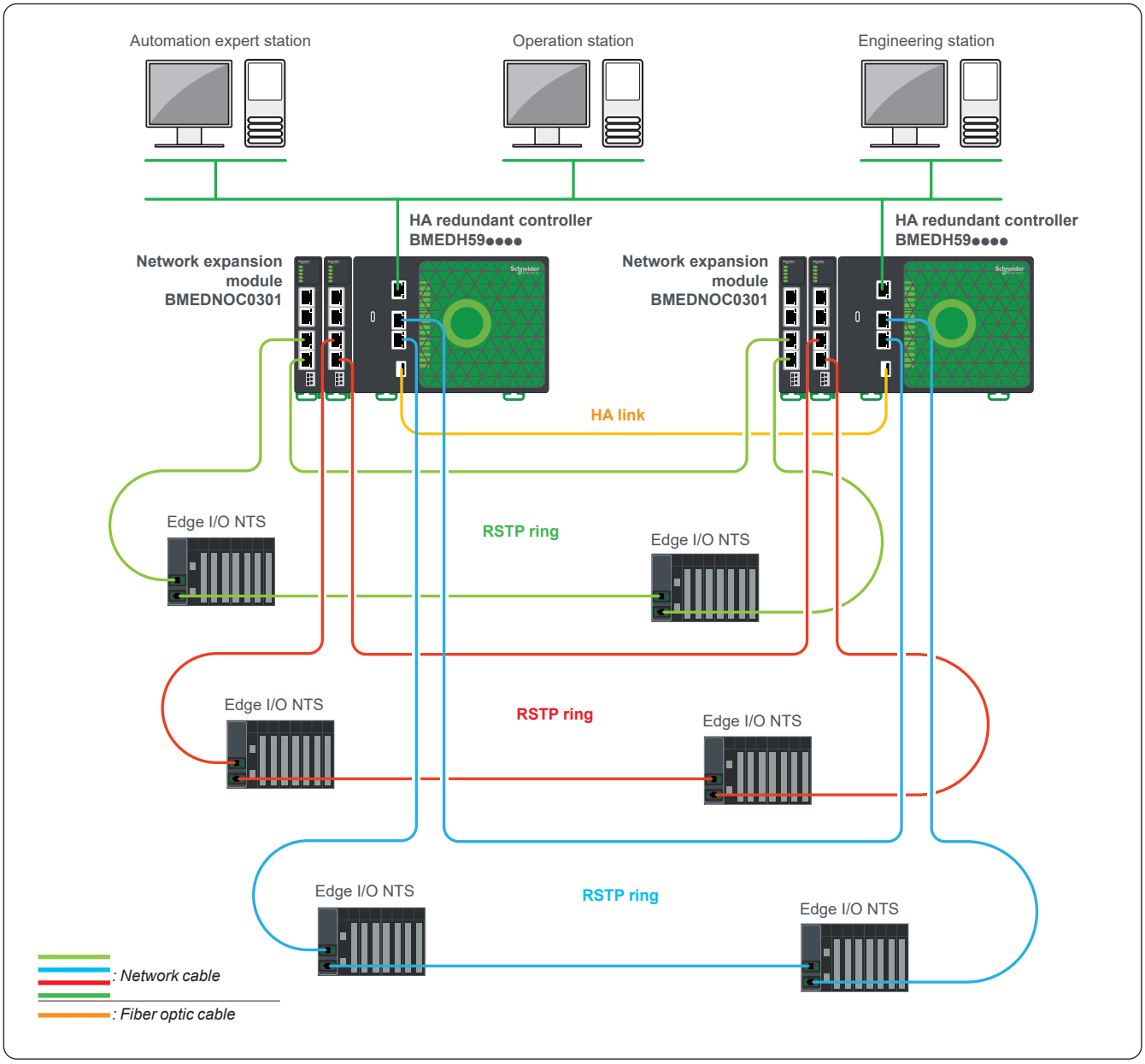
Modicon M590 dPAC high-availability architecture with expansion module

Modicon M590 dPAC can be expanded by up to two network expansion modules, BMEDNOC0301.

- The ETH2 interface of the controller supports the RSTP ring network.
- Each Ethernet expansion module has two LANs; the ETH2 interface supports the RSTP ring network.

Adding two Ethernet expansion modules under a high-availability architecture can support up to six LANs, of which three LANs can form RSTP ring networks.

- Two HA redundant controllers serve as backup for each other and are connected to the same devices, so their respective LANs have the same network architecture.
- If a more complex network architecture is required, a managed switch is recommended.



Example of Modicon M590 dPAC high-availability architecture with expansion module

Modicon M590 dPAC

Distributed Programmable Automation Controller (dPAC)

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- **Simplicity:** Use a single login to access all business services, in one place, available 24/7. You no longer need to log in to multiple platforms.
- **Personalization:** Benefit from content, tools, and business services tailored to your activity, and customize your landing page based on your preferences.

Watch the How-to Videos



Order management

> Select Products and Add to Cart
> Check for Products' Price and Availability
> Order Products with Generic Commercial References



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> Find a Product Data Sheet and Related Documents
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> Stay Up to Date on the Status of My Products



Support

> Get Quicker Answers Thanks to Online Support



Training

> Access Trainings Dedicated to My Activity

Create your account

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