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Industrial Automation

EcoStruxure[™] Automation Expert

Software-defined Automation

Software version v24.1



Life Is On



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EcoStruxure[™] Automation Expert

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EcoStruxure Automation Expert



- > EcoStruxure Automation Expert Build Time encompasses the design, engineering and monitoring of the application.
- > Distributed Programmable Automation Controller (dPAC) platforms with the Universalautomation.org Shared Source Runtime engine:
- ATV dPAC for Altivar
- Modicon M251 dPAC, with TM3 I/O
- Modicon M262 dPAC with TM3 I/O
- Modicon M580 dPAC with X80 I/O
- > Plus, innovative new software-based controllers:
 - Soft dPAC for Windows[™] , for standalone configurations
 - Soft dPAC for Linux[™], for standalone and high availability configurations , compatible with X80 I/O, TM3 I/O, and Edge I/O
- > EcoStruxure Automation Expert HMI, a fully integrated, object-oriented industrial visualization solution
- > EcoStruxure Automation Expert Archive, a centralized solution for the historization of process data, alarms, and trends
- > Schneider Electric Libraries, a comprehensive set of software-defined libraries, ranging from basic functions up to segment solutions
- > Asset Link for Bulk Engineering to extract data from engineering tools for automated application generation
- > Asset Link for AVEVA OMI to create application objects (AppObjects) in the AVEVA System Platform in an automated workflow
- > High Availability add-on to create applications that promote continuous operation and minimize downtime in critical applications by using a High Availability Soft dPAC.
- > Procedural Automation add-on to create, modify, and execute automated routines, recipes, tasks and complex sequences or procedures.
- Note: UniversalAutomation.org is a non-profit organization dedicated to overseeing the implementation of an industrial shared-source runtime execution engine. For more information, please visit universalautomation.org website.



Industrial automation 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 enables standardization on 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

Decoupling the application from implementation

- Simulation and test rigging
- Documentation

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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.

EcoStruxure Automation Expert allows the engineer 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 best capabilities of classic PLC 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.



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.



Presentation

Industrial automation EcoStruxure Automation Expert

EcoStruxure Automation Expert Platform

EcoStruxure Automation Expert Platform enhances collaboration across project teams and minimizes merge conflicts when sharing application development with simultaneous multi-users.

The multi-user capability features a reservation mechanism that enables users to reserve specific zones within a project, making them read-only for other users. This can help minimize potential conflicts. Additionally, the system supports recursive zones, allowing zones to contain sub-zones with dependencies. When a user reserves a zone, all dependent zones are automatically reserved as well, to help prevent potential conflicts.

Each device also functions as a zone; when a user accesses a device – such as logging in, deploying, or monitoring – it becomes unavailable to others. Furthermore, the Automation Expert Platform hosts the main repository, allowing users to work independently without interruptions from other users' deliveries.

The history of changes is tracked by enabling a commit message before any modifications are delivered. This practice enhances accountability and clarity, as each commit message should contain relevant details about the changes made, such as the purpose of the modification, the specific areas impacted, and any related detail. Teams can maintain a clear record of the project's evolution, fostering collaboration and simplifying future reviews or troubleshooting efforts.

EcoStruxure Automation Expert Software

The EcoStruxure Automation Expert software offer includes:

- EcoStruxure Automation Expert Build Time is the main tool for designing, engineering, and monitoring the application.
 - Asset Link for Bulk Engineering to extract data from engineering tools for automated application generation.
 - □ Asset Link for AVEVA OMI to create application objects (AppObjects) in the AVEVA System Platform in an automated workflow
 - □ High Availability add-on to create applications that promote continuous operation and minimize downtime in critical applications by using a High Availability Soft dPAC.
 - □ Procedural Automation add-on to create, modify, and execute automated routines, recipes, tasks, and complex sequences or procedures.
- EcoStruxure Automation Expert HMI Configurator
- EcoStruxure Automation Expert Archive
- Asset-oriented application libraries

EcoStruxure Automation Expert Build Time

EcoStruxure Automation Expert Build Time is an asset-based, fully-integrated engineering environment that allows portable, automation systems to be managed within a single environment. EcoStruxure Automation Expert Build Time provides the capability to:

- Design and manage asset-based applications using object libraries based on multifaceted models such as asset logic, operating modes, HMI symbols and faceplates (including alarms and trends), I/O interface, and asset documentation
- Design the control strategy for process and machine based on asset-oriented objects with single line connections
- Create rich process displays to monitor and control the process from the control room or line terminal by dragging and dropping asset-based objects
- Manage a single solution independently of the number of controllers and HMI stations
- Design the application solution independently of the hardware configuration
- Test and simulate the control and HMI for the whole solution
- Create and modify procedural automation CATs based on S88 state model with graphical editor
- Support multi-user change management through SVN client integration
- Design, configure, and manage network and device topologies
- Flexibly deploy applications to multiple hardware or software platforms based on UniversalAutomation. Org a shared runtime execution engine
- Automatically discover and diagnose compatible runtime devices
- Asset Link for bulk generation of asset instances from AVEVA Engineering or DEXPI files
- Asset Link for bulk generation of asset instances for AVEVA System Platform
- Embedded AVEVA industrial graphic editor in EcoStruxure Automation Expert Build Time to create new AVEVA industrial graphics or to reuse graphics from existing applications
- Secure the automation system by managing authentication with encrypted communication and security certificates at solution and devices level



EcoStruxure Automation Expert V24.1 Build Time

EcoStruxure Automation Expert Software

EcoStruxure Automation Expert Software

EcoStruxure Automation Expert – HMI

EcoStruxure Automation Expert HMI is a tightly integrated human-machine interface designed for EcoStruxure Automation Expert applications. Its features include:

- Compatibility with Windows[™] OS/Linux[™] OS panel PCs
- Seamless management of controller and HMI communication
- Support for single/multi operator stations with cloning
- User management for access control
- Multi-language application
- Monitoring of runtime connections

EcoStruxure Automation Expert HMI Client for WindowTM/LinuxTM operating system can be installed on various hardware such as Workstations, Industrial PCs, and Edge Boxes, provided they meet the minimum system requirements. It facilitates effective management of communication between the controller and HMI.

Furthermore, the EcoStruxure Automation Expert HMI Client for Harmony ST6 is compatible with HMIST6200, HMIST6400, HMIST6500, HMIST6600, HMIST6700, HMISTM6400, and HMISTM6200 touch panel screens. It offers seamless management of controller and automatic HMI communication, particularly ideal for a small number of assets.

EcoStruxure Automation Expert – Archive

EcoStruxure Automation Expert Archive enables the connection between the Distributed Programmable Automation Controller (dPAC) platforms configured in your solution and the Archive database, operating as a highly integrated local data historian. It provides minimal engineering effort for historization and retrieval of live process data, alarms, and events to be displayed within Automation Expert HMI and the capability to integrate with larger enterprise data storage systems by Structured Query Language (SQL). It is compatible with Windows 10, Windows 11, and Linux operating system.



EcoStruxure Automation Expert – AVEVA System Platform integration

EcoStruxure Automation Expert includes native support for System Platform - AVEVA's real-time operations control platform for supervisory, HMI, SCADA, and IIoT applications. EcoStruxure Automation Expert is capable of auto-generating OPC UA-based secure communications between platforms and generate AVEVA System Platform-compatible graphics for clean integration. Furthermore, it now embeds the AVEVA Industrial Graphics editor so that users no longer need to move from EcoStruxure Automation Expert Build Time to AVEVA Build Time, providing unpreceeded integration.

Automation Expert version	Library compatibile version	Platform version for Asset Link	Version for Asset Link and AVEVA Industrial Graphics
V23.0	AVEVA System Platform 2020 R2 SP1	AVEVA System Platform 2020 R2 SP1 or later	No AVEVA Industrial Graphics support
V23.1	AVEVA System Platform 2023	AVEVA System Platform 2020 R2 SP1 or later (New Galaxy creation is possible only with Library compatible version)*	AVEVA System Platform 2023 or later
V24.1	AVEVA System Platform 2023 or R2 SP1	AVEVA System Platform 2020 R2 SP1 or later (New Galaxy creation is possible only with AVEVA System Platform 2023 R2 SP1)*	AVEVA System Platform 2023 or later (New Galaxy creation is possible only with AVEVA System Platform 2023 R2 SP1)*

*Only Select Existing Galaxy from the configurator is possible if Library compatible version is not available with the user.



EcoStruxure Automation Expert Software

EcoStruxure Automation Expert Software (continued)

EcoStruxure Automation Expert – Libraries



Example of field devices symbol and faceplate on EcoStruxure Automation Expert HMI

Example of Application CAT symbol and faceplate on AVEVA OMI

On version 24.1, these libraries are included at no extra cost:

- Field Device
- Base and common process
- Sequence management and Phase Management
- Liquid food
- Water and Wastewater (including desalination)
- Mining, Minerals, and Metals
- Single line power monitoring

Conveying

These libraries include HMI objects that are compatible with Windows and Linux Ubuntu native HMI runtime. Moreover, "plug and produce" software and hardware components from UniversalAutomation.org vendors are fully compatible with EcoStruxure Automation Expert applications, irrespective of the vendor.



With this release the library updates include:

- A modular and hierarchical framework for the application libraries allowing both simplicity and complexity as needed, offering a scalable solution that can be adapted for various industrial automation tasks.
- Transfer and related function blocks in the SE.App2LiquidFood that are used to monitor and manage transfer of liquid materials and their associated sequences that are available in a process. This block works in coordination with phase manager block from App2Procedure to control the sequence blocks from SE.AppSequence library.
- The GroupControl Module in the SE.App2MMM compose of the GroupControl and GroupControlBase CATs designed for efficient management and control of devices in industrial automation scenarios. It allows users to manage and control multiple devices as a group, simplifying the process of coordinating and supervising various elements within a system.

EcoStruxure Automation Expert includes a set of application libraries with generic process and control models such as motors / valves and segment-based libraries with equipment models that include multiple facets – logic, Automation Expert HMI, AVEVA System Platform template, and documentation within a single package to minimize the engineering time.

EcoStruxure Automation Expert offers a comprehensive set of general application libraries with diverse functionalities for process and control models like motors and valves. This accelerates development cycles, helps reduce errors, and enhances overall software quality with logic, Automation Expert HMI object, AVEVA System Platform template, and documentation, all within a single package.

Additionally, specialized application segment-based libraries are provided, enabling developers to streamline their development process with standard functionality. This allows them to focus on adding value to their specific industry or application domain with optimized functions and algorithms tailored to their unique requirements.

EcoStruxure Automation Expert also incorporates a field devices library to facilitate the seamless integration of commonly used Schneider Electric and Technical Partner's field devices via Modbus / Ethernet IP. This library provides the necessary communication mapping, Automation Expert HMI objects for control and diagnostic, and documentation required for their smooth utilization within the application.

EcoStruxure Automation Expert Software

	Expert Software (continued)	
EcoStruxure Automation Expe		
EcoStruxure Automation Expe Library name	Short description	Extended description
Runtime.Base	Standard blocks	This library contains the basic function blocks to be used for: Runtime management Arithmetic functions Logic functions Format conversion Event management etc.
SE.App2Base	Elementary blocks of the application	Library with application CATs covering basic application functions like alarms, conditions, owners, and signal conditioning that are used by other application CATs like the ones from SE.App2CommonProcess.
SE.App2CommonProcess	Common process application	Library with application CATs to address common process assets or functions like digital I/O, analog I/O, motors, valves, flow control, etc. These types of object can be used in any industrial application as well as in process control in manufacturing applications.
SE.AppConveying	Conveying application	Library with application CATs to address common equipment such as conveyors, sorters, transfer tables, and turntables, typically used in logistic hubs and distribution centers.
SE.App2LiquidFood	Liquid and food (CPG)	Library with application CATs to address Liquid and Food applications with mix proof valves; transfer of materials and liquids from a source to a destination; and equipment status function is a crucial component within a system that monitors and reports the operational condition of various equipment.
SE.App2MMM	Mining, Mineral and Metals application	Library with the Group Control application CAT to manage and control multiple devices as a group, simplifying the process of coordinating and supervising various elements within a system.
SE.AppSingleLinePowerMonitoring	Low and medium power monitoring application	Library with application CATs with common functions for electrical objects such as busbars, sources, infeeds, and loads that can be connected to energy management hardware CATs.
SE.App2WWW	State management	Library with application CATs used to monitor and manage control sequences like aeration and dual media filter for Water and Wastewater applications.
SE.App2StateManagement	State management	Library with application CATs to provide state management functionality for generic application (State Manager) as well as ISA-88 based application (Phase Manager). Phase Manager also includes a phase logical interface that accepts commands from external batching interfaces such as AVEVA Batch Management and returns the Phase Manager status.
SE.AppSequence	Sequence Control	Library with a set of application CATs that allows you to create sequential control algorithms with steps and transitions to command control modules. This library works with both SE.AppCommonProcess and t.App2CommonProcess.
SE.DPAC	dPAC hardware controllers	Library containing the dPAC device types
AVEVA.IndustrialGraphicsLibrary	Industrial graphics library	Industrial Graphics are vector-based graphics that can be scaled, animated, embedded into application objects, and deployed. The library contains common industrial equipment. You can modify graphics or add graphics to the library by creating new graphics using the Industrial Graphic Editor.
SE.EAEPortal	AVEVA System Platform Device type	The AVEVA System Platform device type is required by Asset Link for establishing communication and creating the application objects automatically in AVEVA System Platform
SE.FieldDevice	Field device hardware CATs	This library has ready-to-use hardware CATs for motor control, energy management, machine safety, and weighing from Schneider Electric, allowing dPAC communication with these devices by Modbus TCP or Ethernet IP depending on the device
SE.HwCommon	Common hardware CAT functions	Library of functions used by the various hardware CAT libraries
SE.IoATV	Variable speed drive I/O services for ATV dPAC	Library of hardware CATs for Altivar I/O (local and modules) used for the Altivar dPAC module hardware configuration

EcoStruxure Automation Expert Software

EcoStruxure Automation	n Expert – Libraries (continued)	
EcoStruxure Automation	Expert libraries (continued)	
Library name	Short description	Extended description
SE.IoNet	UDP gateway	Library of hardware CATs to enable UDP communication
SE.IoTMx	TM I/O services for M251d/M262d	Library of hardware CATs for TM3 I/O modules used for M251d and M262d hardware configuration
SE.IoX80	X80 I/O services for M580d/CRd	Library of hardware CATs for X80 I/O modules used for M580d/CRd hardware configuration
SE.ModEdgelONTS	Edge I/O services for Simplex Linux Soft dPAC	Library of hardware CATs for Modicon Edge I/O NTS
SE.ModbusGateway	Standard Modbus gateway	Library of hardware CATs to enable Modbus TCP communication with import of data description file
SE.Standard	EcoStruxure Automation Expert HMI device type	Library with EcoStruxure Automation Expert HMI device type
Standard.loEtherNetIP	Standard Ethernet IP scanner functions	Library of hardware CATs used for EIP scanner configuration (Implicit use by the EcoStruxure Automation Expert system when using the EIP scanner and also to add custom EIP connections)
Standard.IoModbus	Standard Modbus functions	Library of hardware CATs to enable Modbus client communication
Standard.IoModbusSlave	Standard Modbus server functions	Library of hardware CATs to enable Modbus server communication
Standard.OPCUAClient	Standard OPC UA client functions	Functions to enable OPC UA client connection, monitor, read, and write data

Definitions:

CAT object: A composite automation type (CAT) function block includes objects with multiple facets:

□ Logic to define its operating modes

□ I/O interfaces to exchange data/events with its environment

□ Symbols/faceplates for control and monitoring in the HMI

 $\hfill\square$ Documentation that is implicitly part of the project online help

■ Application CAT: representing application assets or functions

Hardware CAT: representing hardware devices that can be added to the hardware configuration, for device monitoring and control

EcoStruxure Automation Expert Software

EcoStruxure Automation Expert Software (continued)

System requirements							
Windows – Engineering	, HMI, and Archive						
System requirements	Minimum	Minimum					
	Engineering	НМІ	Archive	Engineering	нмі	Archive	
Processor 1 GHz			2 GHz or higher	2 GHz or higher			
RAM ⁽¹⁾	2 GB	2 GB	2 GB	4 GB	4 GB	4 GB	
Hard disk free space (1)	1 GB	1 GB	1 GB	10 GB	10 GB	10 GB	
Display resolution	1280x1024		!	1920x1080 or hig	1920x1080 or higher		
Pointing device	Mouse or compa	tible					
Network access	One Ethernet int	erface					
Operating system	Microsoft Windows 10 Professional (64-bit) Version 1903 and later, Microsoft Windows 11 Professional Version 21H2 and later, and Microsoft Server Version 2019 (1809 and later)						
.NET framework	.NET 4.8			.NET 4.8 or high	.NET 4.8 or higher		

(1) Requirement is indicated for each software package. More than one software package can be installed on the same device. In this case, you need to add the respective RAM and hard disk free space requirements together. For example, if you install the HMI and Archive software packages on the same device, the minimum RAM required is 4 GB (2 GB + 2 GB).

EcoStruxure Automation Expert Controllers

Distributed Programmable Automation Controller (dPAC) Platforms

Soft dPAC

Soft dPAC is a Edge Controller with a containerized version of UAO shared source runtime engine designed to execute an application and interact with field devices. This hardware-agnostic controller is versatile, capable of installation on various hardware platforms such as servers, workstations, industrial PCs, or microcomputers, provided they meet the minimum requirements.

Soft dPAC supports both Linux[™] and Windows[™] operating systems:

□ The Linux SoftdPAC is ideal for real-time control when installed in conjunction with a Linux real-time patch. □ The Windows SoftdPAC is best suited for non-critical applications that do not demand real-time control.

In a Linux environment, multiple instances of Soft dPAC can be seamlessly installed on a single host machine, allowing tasks like line expansions to be completed without disrupting ongoing processes. This capability minimizes downtime, thereby enhancing productivity and profitability.

For Windows, one Soft dPAC instance can be installed per host machine.

High Availability Soft dPAC

High Availability Soft dPAC (HA Soft dPAC) represents a software-based high availability industrial automation solution engineered to maintain uptime upon a failure, offering resilience against hardware, software or network failures. This capability effectively minimizes process downtime, making it ideal for demanding applications where uninterrupted process flows are critical.

The integration of the high-availability solution with EcoStruxure Automation Expert software plays a pivotal role in enhancing productivity by significantly reducing process downtime.

High Availability Soft dPAC is a versatile edge controller compatible with a variety of hardware options, such as the Schneider Electric Harmony P6 *i*PC and ASRock™ iEP-5000G Series Industrial IoT Controller. For compatibility with other hardware options, please contact your Schneider Electric representative for further details.

Moreover, High Availability Soft dPAC seamlessly integrates with Modicon X80 IOs using the BMECRD0100 Remote I/O module, which provides comprehensive compatibility and functionality within industrial automation setups.

Essential Edge Controller

Essential Edge Controller, a part of the Harmony *i*PC range with pre-installed Soft dPAC. This versatile controller is tailored to meet a diverse set of control and compute application needs. Its design aims to significantly reduce commissioning time, thereby enhancing the overall customer experience.

Product reference: HMIBX1A0NDA

The Essential Edge Controller is an open-to-application edge terminal that runs on Linux operating system. This edge device delivers substantial value for diverse industrial use cases with:

Derived Pre-installed Soft dPAC Simplex, HMI for immediate deployment

Capability to run third-party applications on the same hardware

The Essential Edge controller has no embedded I/O; it supports Remote I/O on Modicon Edge I/O, TM3 I/O, X80 I/O expansion modules with up to 32 devices connected via Modbus TCP/IP or Ethernet IP communication.

Performance Edge Controller

The Performance Edge Controller, a part of the Harmony *i*PC range with pre-installed Soft dPAC. This Edge controller delivers enhanced performance compared to Essential Edge Controller. It comes with pre-installed Soft dPAC Simplex, HMI, and Archive, to provide smooth integration and remarkable flexibility. Moreover, its capability to host third-party applications on the same hardware empowers users to customize and extend functionality to align with their unique requirements.

The Performance Edge Controller operates on the Linux operating system, offering an efficient platform for industrial automation. It seamlessly integrates with a diverse array of industrial applications, providing effortless integration for the industry.

Product Reference: HMIP6-BCTO

It is a configure-to-order product, where the user can choose the processor type (Celeron / i3), Memory size, and accessories.

The Performance Edge controller has no embedded I/O; it supports Remote I/O on Modicon Edge I/O, TM3 I/O, X80 I/O expansion modules with up to 200 devices connected via Modbus TCP/IP or Ethernet IP communication. This innovative Performance Edge controller is an all-in-one solution, streamlining operations and maximizing efficiency.

NOTE: Please contact your Schneider Electric representative for additional information.



HMIBX1A0NDA



HMIP6-BCTO

EcoStruxure Automation Expert Controllers



BMED581020



TM251MDESE



TM262L01MDESE8T

Distributed Programmable Automation Controller (dPAC) Platforms (continued)

Modicon M580 dPAC

A distributed field controller with up to 64 MB ECC RAM for programs and data. The Modicon M580 dPAC supports the robust, high-performance Modicon X80 I/O catalog⁽¹⁾ and is available in standard and conformal coated versions.

Product references:

BMED581020: Modicon M580 dPAC (standard)

BMED581020C: Modicon M580 dPAC (conformal coated)

BMED581020 and BMED581020C controllers support:

□ Up to 1,408 discrete I/O channels⁽²⁾

□ Up to 352 analog I/O channels⁽²⁾

□ Up to 4 racks of local I/O

Modicon M251 dPAC

A cost-optimized, low-footprint distributed controller based on the machine-specialized Modicon M251 Logic Controller platform. The Modicon M251 dPAC provides a single Ethernet port for fieldbus, switched dual Ethernet ports for peer communications, and supports the field-proven TM3 I/O system⁽¹⁾.

Product reference:

■ TM251MDESE: Modicon M251 dPAC

The TM251MDESE controller has no embedded I/O; it supports Modicon TM3 I/O expansion modules:

- □ Up to 112 discrete I/O channels⁽²⁾
- □ Up to 112 analog I/O channels⁽²⁾

□ Up to 14 Modicon TM3 expansion modules (7 local modules + 7 remote modules) with Modicon TM3 bus expansion modules (transmitter module and receiver module)

It is possible to control up to 4 TeSys U and TeSys D motor starters by connecting a **TM3XTYS4** TM3 module to the Modicon M251 dPAC.

Modicon M262 dPAC

This is the controller for performance machines. It is powered with a non-isolated 24 V DC power supply, has a built-in overload protection, embeds a dual-core processor and a 256 MB memory capacity and supports RSTP protocol.

Product reference:

TM262L01MDESE8T: Modicon M262 dPAC

The **TM262L01MDESE8T** controller has no embedded I/O; it supports Modicon TM3 I/O expansion modules:

□ Up to 112 analog I/O channels⁽²⁾

□ Up to 14 Modicon TM3 expansion modules (7 local modules + 7 remote modules) with Modicon TM3 bus expansion modules (transmitter module and receiver module)

It is possible to control up to 4 TeSys U and TeSys D motor starters by connecting a **TM3XTYS4** TM3 module to the Modicon M262 dPAC.

(1) Expert/specialist modules are not supported in this release. Please refer to the compatibility list on page 31.



Presentation (continued)

Industrial automation

EcoStruxure Automation Expert Controllers



Altivar Process drives slots



VW3A3530D

Distributed Programmable Automation Controller (dPAC) Platforms (continued)

Altivar ATV dPAC module

The ATV dPAC module is distributed controller solution platform, with 12 MB memory for programs and data. It is intended to be used as a slide-in option for ATV600, ATV900, and ATV340 variable speed drive (VSD) families(1). The Altivar ATV dPAC module is powered by the drive and provides dual Ethernet sockets for connection to peer controllers, distributed I/O, or remote secondary devices.

Product references:

- VW3A3530D: Altivar ATV dPAC module
- VW3A1111: Graphic display terminal

The **VW3A3530D** dedicated controller has no embedded I/O. However, all standard I/O on the respective Altivar Process and Altivar Machine drives can be used and extended with I/O modules:

- Up to 23 discrete I/O
- Up to 7 analog I/O
- Encoder interfaces (ATV900 and ATV340)

It is possible to control up to 8 Modbus TCP devices, such as Altivar drives and soft starters, TeSys motor starters, remote I/O using a TM3BCEIP bus coupler, PowerLogic meters, or Harmony Hub wireless sensors.

For more information about the input/output capability, refer to <u>Altivar dPAC Module VW3A3530D user guide</u>.

(1) For details, please refer to the compatibility table on page 33.

Presentation (continued)

Industrial automation

EcoStruxure Automation Expert Controllers

Platform	Fechnology (IT)/	Soft dPAC High Availability (Linux)	Simplex Soft dPAC (Linux)	Simplex Soft dPAC (Windows OS)	M580 dPAC	M262 dPAC	M251 dPAC	ATV dPAC
OPCUA	Client	-			-		-	~
	Server	Ø	S	 Image: A start of the start of	S		S	
MQTT	Pub/Sub	-	S	 Image: A start of the start of	\bigcirc		-	\checkmark
Modbus TCP	Client	\checkmark		 Image: A start of the start of	\bigcirc			S
	Server	-					S	S
Modbus RTU	Client	-	-	-	-		S	-
	Server	-	-	_	-			_
EtherNet/IP	Scanner (Client)	-		_				-
PROFIBUS DP	Client	Through Modbus TCP third party gateway <i>(1)</i>	Through Modbus TCP third party gateway (1)	Through Modbus TCP third party gateway (1)	Through Modbus TCP third party gateway (1)	Through Modbus TCP third party gateway <i>(1)</i>	Through Modbus TCP third party gateway (1)	Through Modbus TCP third party gateway <i>(1)</i>
ASi-5 / ASi-3		Through Modbus TCP third party gateway <i>(1)</i>	Through Modbus TCP third party gateway (1)	Through Modbus TCP third party gateway <i>(1)</i>	Through Modbus TCP third party gateway (1)	Through Modbus TCP third party gateway <i>(1)</i>	Through Modbus TCP third party gateway (1)	Through Modbus TCP third party gateway (1)
HART		S		_	-	-	-	-
Open TCP/IP		-						

(1) Refer to the documentation for the compatibility of gateways.

EcoStruxure Automation Expert Controllers

Distributed Programmable Automation Controller (dPAC) Platforms (continued)

Selection guide

		High Availability Soft dPAC	Simplex Soft dPAC (Linux OS)	Simplex Soft dPAC (Windows OS)	Modicon M580 dPAC	Modicon M262 dPAC	Modicon M251 dPAC	Altivar dPAC
			American A American American Ame American American	Market and Andreas and Andre				
Applications	Туре	Containerized device	Containerized device	Virtualized device	Embedded device	Embedded device	Embedded device	Embedded device
	Specification	For critical real time applications	For real time applications	For non-real time applications	For robust process application	For performance modular machines	For small modular machines	For distributed or Variable Speed Drive centric applications, including mini modular machines
Max Application size (Mbytes)		Scalable ⁽¹⁰⁾	Scalable ⁽¹⁰⁾	Scalable ⁽¹⁰⁾	100MB	100MB	20MB	12MB
Commmunication fieldbus and network performance	Embedded	OPCUA Server (20000 variables) Modbus TCP Client (60 devices) ⁽¹⁾	OPCUA Server (20000 variables) OPCUA Client EtherNet/IP (32 devices @20ms RPI) ^(ri) Modbus TCP Client (60 devices) ^(ri) Modbus TCP Server (800 variables) ^(ri)	OPCUA Server (20000 variables) Modbus TCP Client (60 devices) ⁽¹⁾ Modbus TCP Server (800 variables) ⁽¹⁾	OPCUA Server (5000 variables) EtherNet/IP (16 devices @20ms RPI) ^(†) Modbus TCP Client (16 devices) ^(†) Modbus TCP Server (800 variables) ^(†)	OPCUA Server (5000 variables) EtherNet/IP (16 devices @20ms RPI) ⁽¹⁾ Modbus TCP Client (16 devices) ⁽¹⁾ Modbus TCP Server (800 variables) ⁽¹⁾ Modbus RTU 56kbps	OPCUA Server (1000 variables) EtherNet/IP (8 devices @20ms RPI) ⁽¹⁾ Modbus TCP Client (16 devices) ⁽¹⁾ Modbus TCP Server (800 variables) ⁽¹⁾ Modbus RTU 56kbps	OPCUA Server (2000 variables) OPCUA Client Modbus TCP Client (8 devices) ⁽¹⁾ Modbus TCP Server (50 variables) ⁽²⁾
	Optional	Profibus DP through Modbus TCP third party gateway	Asi-5/Asi-3 through Modbus TCP third party gateway Profibus DP through Modbus TCP third party gateway	Asi-5/Asi-3 through Modbus TCP third party gateway Profibus DP through Modbus TCP third party gateway	Asi-5/Asi-3 through Modbus TCP third party gateway Profibus DP through Modbus TCP third party gateway	Asi-5/Asi-3 through Modbus TCP third party gateway Profibus DP through Modbus TCP third party gateway	Asi-5/Asi-3 through Modbus TCP third party gateway Profibus DP through Modbus TCP third party gateway	-
	Connectivity services	-	MQTT Pub/Sub	Open TCP/IP MQTT Pub/Sub	Open TCP/IP	Open TCP/IP	Open TCP/IP	Open TCP/IP
Ι/Ο	Discrete I/O channels	1750 ⁽³⁾	1750 ⁽³⁾	-	1408 ⁽²⁾	448(2)	112 ⁽²⁾	Up to 23 (depending on drive reference)
	Analog I/O channels	1750 ⁽³⁾	1750 ⁽³⁾	-	352	112	112	Up to 7 (depending on drive reference)
Compatible expansion I/O module ranges ⁽⁵⁾	Extension I/O	-	-	-	4 Modicon X80 backplane	14 Modicon TM3	14 Modicon TM3	-
	Remote I/O	16 Modicon X80 backplane ⁽⁴⁾	16 Modicon X80 backplane ⁽⁴⁾	-	-	-	-	-
	Distributed I/O	-	Modicon Edge I/O NTS	-	-	-	-	-
References		Hardware agnostic ⁽⁸⁾	Hardware agnostic ⁽⁸⁾	Hardware agnostic ⁽⁹⁾	BMED581020 / BMED581020C	TM262L01MDESE8T	TM251MDESE	VW3A3530D ⁽⁶⁾ / VW3A1111 ⁽⁷⁾

(1) Recommended limit

(2) Typical architecture – I/O can increase or decrease depending on the I/O scan rate or change rate, and the auxiliary application load with connected devices, such as Modbus.

(3) I/O count can increase or decrease depending on the CPU version used on the host iPC, I/O scan rate or change rate, and the auxiliary application load with connected devices, such as Modbus. The host iPC processor speed greatly affects the performance capabilities of the controller. The performance limits can be increased when using more powerful iPC (a) I/O count can increase or decrease depending on the CPO version used on the nost IPC, I/O scan rate or change rat processors, such as the Intel i5/i7 offerings.
 (4) BMECRD0100: Ethernet Remote I/O drop adapter for Edge Controller powered by Soft dPAC
 (5) Consult the <u>DIA3ED2140109EN</u> and <u>DIA6ED2131203EN</u> catalog for additional information on the I/O compatibility.
 (6) Altivar ATV dPAC module

(7) Graphic display terminal for Altivar ATV340

(8) Reference value based on the Harmony P6 Celeron (2 cores)
 (9) Minimum requirements available in the section Windows – Software dPAC (page 13).

(10) Maximum application size can increase or decrease depending on the CPU version on the host iPC.

EcoStruxure Automation Expert Controllers

Distributed Programmable Automation Controller (dPAC) Platforms (continued)

System requirements					
Linux – Software dPAC					
System requirements	Minimum	Recommended	Required for RT control		
OS Debian 10.3, Ubuntu 18.04 and 20.04, or Raspbian 32- or 64-bit Ubuntu 20.04 with low-latency patch or other distribution with PREEMPT-RT p.					
Docker	Docker 19.03.8 and above				
CPU	X86/ARM 1 GHz or higher	Multi-core X86/ARM 1 GHz or higher	Dedicated cores		
RAM	256 MB	1 GB			
HDD/SSD	16 GB	32 GB			
Network interface	At least one Network Interface Card (NIC)	Two NICs to isolate control and device networks One NIC per container for RT fieldbuse			
Time synchronization	NTPv4 client	NTPv4 client support with monotonic and drift compensation			

Linux – Software dPAC, High Availability ⁽¹⁾					
System requirements	Description	Note			
Processor	PC Celeron 4305UE, 2 Core, 2 Threads	Need Multi-core X86 processor. ARM is not supported for v24.1			
RAM	SO-DIMM RAM 4 GB	Minimum 4GB. ECC support is optional.			
Memory	M.2 SSD Standard Endurance 128 GB	128 GB is not required. However, it is the lowest that was tested.			
Network interface	RJ45 GbE Ethernet NIC	Three NICs are needed for redundant network configuration. • One 1 GB speed NIC for interlink connection • Two 100MB for device network			
Operating system	Linux	Ubuntu 20.04 (Harmony P6)/22.04 (ASRock) tested			

(1) A set of 2 manageable switches compatible with RSTP and having at least 6 physical ports is also needed.

Windows – Software dPAC	Windows – Software dPAC						
System requirements	Minimum	Performance					
Processor	1 GHz	2 GHz or higher					
RAM ⁽¹⁾	2 GB	4 GB					
Hard disk free space ⁽¹⁾	1 GB	10 GB					
Display resolution	1280x1024	1920x1080 or higher					
Pointing device	Mouse or compatible	·					
Network interface	One Ethernet interface						
Operating system	Microsoft Windows 10 Professional (64-bit) Version 1903 and later, Microsoft Windows 11 Professional Version 21H2 and later, and Microsoft Server Version 2019 (1809 and later)						
.NET framework	.NET 4.8	.NET 4.8 or higher					

(1) Requirement is indicated for each software package. More than one software package can be installed on the same device. In this case, you need to add the respective RAM and hard disk free space requirements together. For example, if you install the HMI and Archive software packages on the same device, the minimum RAM required is 4 GB (2 GB + 2 GB).

EcoStruxure Automation Expert Architecture

Types of standard architectures

EcoStruxure Automation Expert breaks the dependency between the application software and the hardware platform it runs. Together with its distribution capabilities, EcoStruxure Automation Expert is a unique automation tool to be used in any kind of architecture, from small machines up to complex process architecture.

Example of Soft dPAC standard architecture

The architecture for small machines increases engineering efficiency by using the Automatically generated network transparent communications between controller and HMI objects with many-to-many connectivity and communication protocol for field devices.



Example of distributed standard architecture

The openness and scalability makes it ready for IT/OT with connectivity AI model by HTTP and apps and analytics in an architecture with distributed controllers.



Industrial automation EcoStruxure Automation Expert

Architecture

Example of complex standard architecture

The complex architecture below illustrates the extensive possibilities of distributed control application among the different dPACs. This example is focused on a combination of Modicon M580d and Altivar ATVd dPACs.



Industrial automation EcoStruxure Automation Expert

Architecture

Types of high-availability architectures

The Soft dPAC HA solution is used for more demanding applications in terms of the availability of the control/command system where no interruption of the process can be tolerated. The Soft dPAC HA solution helps increase productivity by minimizing process downtime.

High-availability Soft dPAC based on Ethernet RIO architecture

The high-availability configuration comprises two identical *i*PCs (industrial computers), each hosting a High-Availability Soft dPAC, and configured to run in a Pair where one instance (a Partner) is driving the process while the other Partner is ready to take over control, if the first one stops working.

The two Partners check each other's availability by communicating over two links:

- A dedicated cable (the HA Interlink), and
- The device network, which also carries commands and diagnostics.

In a high-availability Soft dPAC topology based on an Ethernet RIO architecture, devices are hardwired on remote I/O over Ethernet by BMECRD1020 (RIO drop adapter for Modicon X80 I/Os modules). This high-availability system is used for sensitive processes that require a bumpless I/O control takeover time.



1. Linux-based iPC pair, each hosting an instance of High Availability Soft dPAC

- 2. HA Interlink: 1GB/s Network Interface Card (NIC)/connection
- 3. Redundant network: 100MB/s with NIC bonding
- 4. Linux-based standalone iPC, hosting an instance of non-redundant Soft dPAC
- 5. Non-redundant Modicon X80 I/O drop with BMECRD0100 RIO drop adapter and redundant power supplies
- 6. Non-redundant Modicon X80 I/O drop with BMECRD0100 RIO drop adapter and redundant power supplies
- 7. Remote I/O RSTP enabled ring network
- 8. Workstation running EcoStruxure Automation Expert Build Time
- 9. Workstation running AVEVA System Platform (ASP), AVEVA Operation Management Interface (OMI), and AVEVA historian. Communication is over OPC UA
- 10. Workstation running EcoStruxure Automation Expert Runtime HMI
- 11. Managed switches, for example, Modicon switch

EcoStruxure Automation Expert Architecture

Components of a high-availability system

High-Availability Soft dPAC pair

At the heart of a high-availability architecture are two iPCS - Preferred Primary and Non-Preferred Primary, with identical hardware configurations, based on Linux software connected via a high-speed (1 Gbps) communication link.

The Preferred Primary device executes the application program and controls the I/Os located in Modicon X80 drops. The Non-Preferred Primary remains in the background. In the event of a detected error affecting the Primary device, the Standby system switches over automatically, changing over the execution of the application program and control of the I/O to the Standby device with an up-to-date data context. Once the changeover is complete, the Standby device becomes the Primary device while the former Primary device is being cleared from the detected error: when clearance is done, the device reconnects to the standby system and acts as the Standby device. The changeover from Primary to Standby is performed smoothly at the outputs and is completely transparent to the process.

Modicon X80 Redundant power supplies and compatible backplanes

For high-availability applications, two BMXCPS••02 redundant power supplies can be used on the same rack to increase the availability of power supply. They are supported by 6-slot BMEXBP0602 backplane and 10-slot BMEXBP1002 backplane equipped with dual slots marked CPS1 and CPS2. On CPS1 slot, the power supply is initially set as Primary and on CPS2 slot, as Standby. When power stops being supplied in accordance with expected rate, they switch roles so that power can be continuously delivered. See Modicon X80 modules catalog for more details.

Example of complex high-availability architecture



The complex architecture illustrates the extensive possibilities of the High-Availability Soft dPAC in terms of cross-communication, RIO and DIO networks:

- 1. Linux-based iPC pair, each hosting an instance of High Availability Soft dPAC
- 2. HA Interlink: 1GB/s NIC/connection
- 3. Redundant network: 100MB/s with NIC bonding
- 4. Remote I/O RSTP enabled ring network
- 5. Non-redundant X80 I/O drop with:
 - BMECRD0100 RIO drop adapter
 - Redundant power supplies on the main backplane
- 6. Non-redundant Modicon X80 I/O drop with BMECRD0100 RIO drop adapter
- 7. Cross-communication with Altivar ATVdPAC for motor control
- 8. Modbus TCP devices such as in an Intelligent power (PM5500), motor control center (MasterPact MTZ) or motor controllers (TeSysT) 9. Managed switches
- 10. Workstation running AVEVA System Platform (ASP), AVEVA Operation Management Interface (OMI), and AVEVA historian Communication is over OPC UA
- 11. Workstation running EcoStruxure Automation Expert Runtime HMI.

Presentation, references

Industrial automation

EcoStruxure Automation Expert

EcoStruxure Automation Expert – Perpetual licensing

The EcoStruxure Automation Expert offer provides a simplified approach to the software licensing model. The offer has two categories of licenses – **Build** and **Run**.

r ↓-▶		BUILD Per	petual		RUN Perpetual	
	Lite License	Standard License	Professional License	Application License for Hard dPAC	Application License for Soft dPAC	
		Optional Add-ons			Optional Add-ons	

EcoStruxure Automation Expert – Build license

The **Build** software requires a license per seat to create Automation Expert based applications. The **Build** engineering license provides the capability to create, configure, and manage UAO runtime control applications, HMI, archive, and network/device topologies.

The Build licenses can be perpetual or subscription-based⁽¹⁾ and are available in four types:

Trial: The engineering software includes a full function demo mode for 42 days unlicensed. During the trial period, all the software features except the application deployment and features protected by engineering add-on licenses can be used.

Lite: The Lite engineering license includes an essential set of features designed for entry level machine and small process applications. The limitations of this type of license include no support for optional add-ons and custom library creation.

Standard: The Standard engineering license includes a basic set of features, supports custom library creation and offers the ability to extend features by including add-on licenses.

The add-ons that are available with EcoStruxure Automation Expert Standard licenses are:

- Asset Link for AVEVA OMI, optional add-on to create applications objects in the AVEVA System Platform in an automated workflow.
- High Availability Engineering, optional add-on to create applications that promote continuous operation and minimize downtime in critical applications by using high availability soft dPAC.
- Procedural Automation, optional add-on to create automated routines, task and complex sequences or procedures.
- Asset Link for Bulk Engineering, to extract data from engineering tools for automated application generation and is already included in the Standard engineering license v24.1.

Professional: The Professional engineering license includes all currently available features. Any new features released within the first year following the activation date will be included in software updates.

Each commercial license provides:

- The capability to design, develop, simulate with HMI, and commission a complete system
- Collaborative engineering (SVN client) plugin
- Physical topology editor
- Free software updates, within the first 12 months from the activation date
- Support desk from 9 am to 5pm
- Access to private communities on exchange.se.com for p2p support, libraries, project samples, training material, TVDAs, and so on.

(1) For more information, refer to EcoStruxure Automation Expert – Subscription-based licensing

BUILD Perpetual					
Lite License	Standard License	Professional License			
Essential Features	Essential Features Custom Libraries Creation Incl. Asset Link for Bulk Engineering add-on	(Includes all add-ons)			
	High Availability add-on				
	Asset Link for OMI add-on				
	Procedural Automation add-on				

EcoStruxure Automation Expert Licenses

Build license compatibilit	у		
Supported platforms	Lite	Standard	Professional
Soft dPAC	\checkmark		\checkmark
Soft dPAC High Availability	-	Ø	v
ATV dPAC	\checkmark	S	\checkmark
M251 dPAC	S	S	S
M262 dPAC	~	Ø	S
M580 dPAC	~	S	S
Add-ons (per seat)			
Asset Link for Bulk Engineering	-	\checkmark	S
Asset Link for AVEVA OMI	-	Optional	S
High Availability Engineering	-	Optional	S
Procedural Automation	-	Optional	

Engineering license references

The **Build** engineering licenses are available in different types: Lite, Standard, or Professional. Standard and Professional licenses can be perpetual or subscription-based⁽¹⁾ and are currently offered for single seat use only.

Reference	Description
EALBTLC	Lite Engineering License
EALBTC	Standard Engineering License
EALBFC	Professional Engineering License
EALUAOC	Engineering license for UAO vendor

The standard engineering license includes the "Asset Link for Bulk Engineering" add-on and allows for the addition of the following add-ons:

Reference	Description
EALBATC	Add-on for Asset Link for AVEVA OMI
EALBAHC	Add-on for High Availability
EALBAPC	Add-on for Procedural Automation

Industrial automation EcoStruxure Automation Expert

Licenses

EcoStruxure Automation Expert – Perpetual licensing (continued)

EcoStruxure Automation Expert – Run licenses

In addition to the **Build** engineering license that is required to create EcoStruxure Automation Expert applications, for the operation and maintenance of the application, each hardware should have a **Run** license.

The **Run** application licenses are based on the control type of Schneider Electric dPAC controllers and the number of devices connected for the Soft dPAC PC-based control. The **Run** application licenses are available in perpetual and subscription-based model. For more information, refer to page 27.

The Run add-on licenses are optional licenses and are based on the type of HMI platform or communication protocol used in the application.



For exact calculation of the number of devices and controller type for the application license, a software license configurator for EcoStruxure Automation Expert is available on our website.

Industrial automation EcoStruxure Automation Expert

Licenses

EcoStruxure Automation Expert – Perpetual licensing (continued)

EcoStruxure Automation Expert – Run Application Licenses

The **Run** application licenses are available in two types:

Run application license for Hard dPAC, based on the control type of Schneider Electric dPAC controllers:

Select type of controller			
DEVICE MICRO		SMALL	LARGE
ATV dPAC	M251 dPAC, M262 dPAC	M580 dPAC (Single Backplane)	M580 dPAC (Ext.Backplane)

The available Run application licenses for Hard dPAC controllers are:

Reference	Description
EALADP	Application license for one dPAC runtime instance, DEVICE
EALAMP	Application license for one dPAC runtime instance, MICRO
EALASP	Application license for one dPAC runtime instance, SMALL
EALALP	Application license for one dPAC runtime instance, LARGE

Run application license for Soft dPAC, based on the number of devices or IO points connected for the application. For exact calculation of the number of devices or IO points for the application license, a software license configurator for EcoStruxure Automation Expert is available on our website.

The available Run application license for Soft dPAC are:

Reference	Description
EALDXP ⁽¹⁾	Application Lite 10 IO devices
EALDCP	Application Standard 100 IO devices
EALDMP	Application Standard 1000 IO devices
EALDVMP	Application Standard 5000 IO devices
EALDHACP	Application High Availability 100 IO devices
EALDHAMP	Application High Availability 1000 IO devices
EALDHAVMP	Application High Availability 5000 IO devices

(1) Only available with Automation Expert Lite build time.

EcoStruxure Automation Expert Licenses

EcoStruxure Automation Expert – Perpetual licensing (continued) Run license compatibility Available Licenses Lite Standard Professional Device Micro Hard Small Large 10 Pack 100 Pack _ **R** Soft 1000 Pack _ 5000 Pack _



For exact calculation of the number of devices and controller type for the application license, a software license configurator for EcoStruxure Automation Expert is available on our website.

EcoStruxure Automation Expert Licenses

> Download the HMIBMI, HMIBMO, and HMIP6 ranges catalog

EcoStruxure Automation Expert – Perpetual Licensing (continued)

EcoStruxure Automation Expert – HMI license

The Automation Expert HMI license includes rights to both HMI and Archive runtimes. All runtime licenses are perpetual. Different license types are required depending on the platform on which the runtime is installed, as per the following table:

Automation Expert Runtime	Platform	License type
HMI ⁽¹⁾	Harmony ST6	1 license per HMI runtime instance
	HMI range	
HMI ⁽¹⁾	PC-type HMI	1 license per HMI runtime instance
	(Windows 10/Linux)	

(1) Each license includes both Automation Expert HMI and Automation Expert Archive runtime rights.

The Automation Expert HMI Runtime licenses are:

Reference	Description
EALH1P Automation Expert HMI Runtime - Panel (ST6)	
EALH2P	Automation Expert HMI Runtime - Operator (iPC)

For exact calculation of the number of devices and controller type for the application license, a software license configurator for Automation Expert is available on se.com.

EcoStruxure Automation Expert – Communication Protocol License

EcoStruxure Automation Expert – Communication Protocol license is an optional **RUN** license required to connect to any device using the specified protocol.

The communication protocol OPC UA client provides service function blocks that allow to connect over OPC UA to multiple servers and exchange data with them, including read, write, and monitor data rights.

The communication protocol OPC UA client is available on the following platforms:

- Soft dPAC Linux, includes encrypted communication between client and server.
- Soft dPAC Windows.
- ATV dPAC, includes encrypted communication between client and server.

Reference	Description
EALCUP	Automation Expert – Communication Protocol OPC UA Client

Presentation, references (continued)

Industrial automation EcoStruxure Automation Expert

Licenses

EcoStruxure Automation Expert – Subscription-based licensing

To provide customers with more business and economic model flexibility and reduced obsolescence risk, both **Build** and **Run** licenses are available under a subscription-based model consisting of 1-year termed subscriptions. The subscription-based licenses model is available for project business with end-users.



Each commercial license provides:

- The capability to design, develop, simulate with HMI, and commission a complete system
- Collaborative engineering (SVN client) plugin
- Physical topology editor
- Free software updates
- Support desk from 9 am to 5pm
- Access to private communities on exchange se com for p2p support, libraries, project samples, training material, TVDAs, and so on.

Build subscription-based licenses

The Build subscription-based licenses are available in three different types:

- **Trial**: The engineering software includes a full function demo mode for 42 days unlicensed.
- Standard: A basic set of features equivalent to Standard perpetual-based license.
- Professional: this version includes all available features, including:
 - Asset Link for AVEVA OMI
 - □ High Availability Engineering

The Build subscription-based licenses are offered for single-seat use only. A license is needed per user.

Reference	Description	
EALBTS1	Build - Standard Engineering Yearly	
EALBTS2	Build - Professional Engineering Yearly	

Run subscription-based licenses

The Run subscription-based licenses are available in two different types:

Standard: for simplex applications.

■ High Availability: for high availability applications.

The **Run** subscription-based licenses are sized per device. A license is needed per device. To know how to measure the number of devices of your application, refer to the EcoStruxure Automation Expert – Perpetual Licensing.

Reference	Description
EALOMD1	Run – Standard IO Device Yearly
EALOMD2	Run – High Availability IO Device Yearly

Please contact your Schneider Electric representative for additional information.

In addition to the advantages included in Perpetual licenses, subscription-based licenses include:

■ Access to upcoming software releases and features in the scope of your license

Customer adoption support plan, with a Trusted Advisor that will support you to reduce your time to value with each new release and its features, recommend the appropriate evolutions, and support you on license lifecycle and renewal process.

EcoStruxure Automation Expert Licenses - Example

EcoStruxure Automation Expert Licensing – Architecture

Example of distributed controller architecture



(1) IO Devices is the metric that dimensions the size of the EcoStruxure Automation Expert application based on the number of inputs and outputs for each field device, whether they are hardwired or virtual.

Build license				
Reference	Description	No. of Seats		
EALBTLC	EcoStruxure Automation Expert - Lite Engineering License	2		
Runlicense				
Unit 1 – Modicon M262d Control				
Reference	Description	No. of Licenses		
EALAMP Application license for one dPAC runtime instance, MICRO		1		
Unit 2 – Modicon M580d Control				
Reference	Description	No. of Licenses		
ALASP Application license for one dPAC runtime instance, SMALL		1		
Unit 3 – Simplex Soft dPAC Control 45 IO Devices				
Reference	Description	No. of Licenses		
EALDXP	EcoStruxure Automation Expert - Application Lite 10 IO Devices	5		

EcoStruxure Automation Expert Licenses - Example

EcoStruxure Automation Expert Licensing – Architecture (continued) Example of high-availability architecture



(1) IO Devices is the metric that dimensions the size of the EcoStruxure Automation Expert application based on the number of inputs and outputs for each field device, whether they are hardwired or virtual.

Build license		
Reference	Description	No. of Seats
EALBTC	EcoStruxure Automation Expert - Standard Engineering License	1
Add on		
Reference	Description	No. of Licenses
EALBAHC	EcoStruxure Automation Expert – Addon for High Availability	1
Run license		
Unit 1 – High Availability C	ontrol 344 IO devices	
Reference	Description	No. of Licenses
EALDHACP	EcoStruxure Automation Expert - Application High Availability 100 IO Devices	4
Add on		
Reference	Description	No. of Licenses
EALH2P	EcoStruxure Automation Expert HMI Runtime Operator	1

EcoStruxure Automation Expert Licenses - Example

EcoStruxure Automation Expert Licensing – Architecture (continued) Example of simplex and high availability controller architecture



(1) IO Devices is the metric that dimensions the size of the EcoStruxure Automation Expert application based on the number of inputs and outputs for each field device, whether they are hardwired or virtual.

Build license		
Reference	Description	No. of Seats
EALBFC	EcoStruxure Automation Expert - Professional Engineering License	2
Run license		
Unit 1 – High Availability Control	344 IO Devices	
Reference	Description	No. of Licenses
EALDHACP	EcoStruxure Automation Expert - Application High Availability 100 IO Devices	4
Unit 2 – Simplex Control 190 IO D	evices	
Reference	Description	No. of Licenses
EALDCP	EcoStruxure Automation Expert - Application Standard 100 IO Devices	2

Industrial automation EcoStruxure Automation Expert

EcoStruxure Automation Expert Product compatibility according to dPAC platform

List of Modicon X80 hardware compatible with Modicon M580 dPAC, Modicon CRD for Simplex/High

Туре	Soft dPAC (Linu Reference	Description	Compatibility with	Commetibility with
			Modicon M580 dPAC	Compatibility with Modicon CRD for Simplex/High Availability Soft dPAC (Linux OS)
Rack	BMEXBP0400	4-slot Ethernet backplane	Yes	Yes
Rack	BMEXBP0400H	Ruggedized 4-slot Ethernet backplane	Yes	Yes
Rack	BMEXBP0602	6-slot Ethernet backplane redundant PS	Yes	Yes
Rack	BMEXBP0602H	Ruggedized 6-slot Ethernet backplane redundant PS	Yes	Yes
Rack	BMEXBP0800	8-slot Ethernet backplane redundant PS	Yes	Yes
Rack	BMEXBP0800H	Ruggedized 8-slot Ethernet backplane redundant PS	Yes	Yes
Rack	BMEXBP1002	10-slot Ethernet backplane redundant PS	Yes	Yes
Rack	BMEXBP1002H	Ruggedized 10-slot Ethernet backplane redundant PS	Yes	Yes
Rack	BMEXBP1200	12-slot Ethernet backplane redundant PS	Yes	Yes
Rack	BMEXBP1200H	Ruggedized 12-slot Ethernet backplane redundant PS	Yes	Yes
Rack	BMXXBC008K	Backplane extension cable 0.8 m/2.6 ft	Yes	Yes
Rack	BMXXBC015K	Backplane extension cable 1.5 m/4.9 ft	Yes	Yes
Rack	BMXXBC030K	Backplane extension cable 3 m/9.8 ft	Yes	Yes
Rack	BMXXBC050K	Backplane extension cable 5 m/16.4 ft	Yes	Yes
Rack	BMXXBC120K	Backplane extension cable 12 m/39 ft	Yes	Yes
Rack	BMXXBE1000	Standard backplane extender	Yes	Yes
Rack	BMXXBE1000H	Ruggedized Standard backplane extender	Yes	Yes
Rack	BMXXBE2005	Backplane extender kit	Yes	Yes
Rack	BMXXBP0400	4-slot backplane	Yes	Yes
Rack	BMXXBP0400H	Ruggedized 4-slot backplane	Yes	Yes
Rack	BMXXBP0600	6-slot backplane	Yes	Yes
Rack	BMXXBP0600H	Ruggedized 6-slot backplane	Yes	Yes
Rack	BMXXBP0800	8-slot backplane	Yes	Yes
Rack	BMXXBP0800H	Ruggedized 8-slot backplane	Yes	Yes
Rack	BMXXBP1200	12-slot backplane	Yes	Yes
Rack	BMXXBP1200H	Ruggedized 12-slot backplane	Yes	Yes
Power	BMXCPS2000	Standard AC power supply	Yes	Yes
Power	BMXCPS2010	Standard isolated DC power supply	Yes	Yes
Power	BMXCPS3020	High-power isolated 24 to 48 V DC power supply	Yes	Yes
Power	BMXCPS3020H	Ruggedized high-power isolated 24 to 48 V DC power supply	Yes	Yes
Power	BMXCPS3500	High-power AC power supply	Yes	Yes
Power	BMXCPS3500H	Ruggedized high-power AC power supply	Yes	Yes
Power	BMXCPS3522	Redundant 125 V DC power supply	Yes	Yes
Power	BMXCPS3540T	High-power 125 V DC power supply	Yes	Yes
Power	BMXCPS4002	Redundant AC power supply	Yes	Yes
Power	BMXCPS4022	Redundant 24 to 48 V DC power supply	Yes	Yes
SD card	BMXRMS004GPF	Optional M580 SD card 4 GB	Yes	No
Analog I/O	BMEAHI0812	8x current isolated analog inputs, HART	Yes	Yes
Analog I/O	BMXAMI0410	4x voltage/current isolated high-speed analog inputs	Yes	Yes
Analog I/O	BMXAMI0410H	Ruggedized 4x voltage/current isolated high-level analog inputs	Yes	Yes
Analog I/O	BMXAMI0800	8x voltage/current non-isolated fast analog inputs	Yes	Yes
Analog I/O	BMXAMI0810	8x voltage/current isolated fast analog inputs	Yes	Yes
Analog I/O	BMXAMI0810H	Ruggedized 8x voltage/current isolated fast analog inputs	Yes	Yes
Analog I/O	BMXART0814	8x isolated TC/RTD inputs	Yes	Yes
Analog I/O	BMXART0814H	Ruggedized 8x isolated TC/RTD inputs	Yes	Yes
Analog I/O	BMEAHO0412	4x current isolated high-level analog outputs, HART	Yes	Yes
Analog I/O	BMXAMO0210	2x isolated analog outputs	Yes	Yes
Analog I/O	BMXAMO0210H	Ruggedized 2x voltage/current isolated analog outputs	Yes	Yes
Analog I/O	BMXAMO0410	4x voltage/current isolated analog outputs	Yes	Yes
Analog I/O	BMXAMO0410H	Ruggedized 4x voltage/current isolated analog outputs	Yes	Yes
Analog I/O	BMXAMO0802	8x current non-isolated analog outputs	Yes	Yes
Analog I/O	BMXAMM0600	4x analog inputs - 2x analog outputs	Yes	Yes
Analog I/O	BMXAMM0600H	Ruggedized 4x analog inputs - 2x analog outputs	Yes	Yes
Discrete I/O	BMXDAI0805	8x 200240 V AC non-isolated discrete inputs	Yes	Yes
Discrete I/O	BMXDAI0814	8x 100120 VAC isolated discrete inputs	Yes	Yes
Discrete I/O	BMXDAI1602	16x 24 V non-isolated discrete inputs	Yes	Yes
Discrete I/O	BMXDAI1602 BMXDAI1602H	Ruggedized 16x 24 V non-isolated discrete inputs	Yes	Yes
Discrete I/O				Yes
Discrete I/O	BMXDAI1604	16x 100120 V AC capacitive inputs	Yes	Yes
Discrete I/O	BMXDAI1604H BMXDAI16142	Ruggedized 16x 100120 V AC capacitive inputs	Yes	Yes
Discrete I/O	BMXDAI16142 BMXDAI1614	16x 100120 V AC isolated discrete inputs	Yes	Yes
	DIVIADATIO 14	16x 100120 V AC isolated discrete inputs	100	163



EcoStruxure Automation Expert Product compatibility according to dPAC platform

List of Modicon X80 hardware compatible with Modicon M580 dPAC, Modicon CRD for Simplex/High

TypeReferenceDescriptionCompatibility with Modicon CRD for Simplex/High A variability Soft APAC (Linux OS)Compatibility with Modicon CRD for Simplex/High A variability Soft APAC (Linux OS)Discrete I/OBMXDA11615HRuggedized 16x 120120 VAC isolated discrete inputsYesYesDiscrete I/OBMXDA11615HRuggedized 16x 200240 VAC isolated discrete inputsYesYesDiscrete I/OBMXDA11616PRuggedized 16x 200240 VAC isolated discrete inputsYesYesDiscrete I/OBMXDD1160216x 24 VD Cs ink discrete inputsYesYesDiscrete I/OBMXDD1160316x 48 VD Cs ink discrete inputsYesYesDiscrete I/OBMXDD11603Ruggedized 16x 44 VD Cs ink discrete inputsYesYesDiscrete I/OBMXDD11603Ruggedized 16x 44 VD Cs ink discrete inputsYesYesDiscrete I/OBMXDD1603Ruggedized 25x 24 VD Cs ink discrete inputsYesYesDiscrete I/OBMXDR40805HRuggedized 25x 24 VD Cs ink discrete inputsYesYesDiscrete I/OBMXDR40805HRuggedized 25x 24 VD Cs ink discrete inputsYesYesDiscrete I/OBMXDR40805HRuggedized 8x inclearete inputsYesYesDiscrete I/OBMXDR40805HRuggedized 8x inclearete inputsYesYesDiscrete I/OBMXDR40805HRuggedized 8x inclearete inputsYesYesDiscrete I/OBMXDR40805HRuggedized 16x inclearete inputsYesYesDiscrete I/OBMXDR40805H	Availability	Soft dPAC (Linux	(OS)		
Discrete I/O BMXDA11615 16x 200240 VAC isolated discrete inputs Yes Yes Discrete I/O BMXDA11615H Ruggedized 16x 200240 VAC isolated discrete inputs Yes Yes Discrete I/O BMXDD11602 16x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD11603H Ruggedized 16x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD1602H Ruggedized 16x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD1602H Ruggedized 16x 44 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202H Ruggedized 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202H Ruggedized 16x 40 VD C sink discrete inputs Yes Yes Discrete I/O BMXDD16402K 64x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDRA0805H Ruggedized 6x non-isolated relay outputs Yes Yes Discrete I/O BMXDRA0805H Ruggedized 6x isolated relay outputs Yes Yes Discrete I/O BMXDRA0805H	Туре	Reference	Description		Modicon CRD for Simplex/High Availability Soft dPAC
Discrete I/O BMXDA11615H Ruggedized 16x 200240 VAC isolated discrete inputs Yes Yes Discrete I/O BMXDD116024 16x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD116024 16x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD116031 Ruggedized 16x 48 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD11602H Ruggedized 15x 48 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202H Ruggedized 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDRA0805 8x non-isolated relay outputs Yes Yes Discrete I/O BMXDRA0805 8x isolated relay outputs Yes Yes Discrete I/O BMXDRA0805H Ruggedized 8x isolated relay outputs Yes Yes Discrete I/O BMXDRA0815H Ruggedized 16x transitor source 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD01602H Rw transistor source 0.5 A	Discrete I/O	BMXDAI1614H	Ruggedized 16x 100120 V AC isolated discrete inputs	Yes	Yes
Discrete I/O BMXDD11602 16x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD116021H Ruggedized 16x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD116031H Ruggedized 16x 48 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD130202 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD132021 Ruggedized 25x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202H Ruggedized 78x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD14602K 64x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDRA0805 M Ruggedized 78x isolated relay outputs Yes Yes Discrete I/O BMXDRA0805H Ruggedized 8x isolated relay outputs Yes Yes Discrete I/O BMXDRA0815H Ruggedized 16x isolated relay outputs Yes Yes Discrete I/O BMXDRA0815H Ruggedized 16x isolated relay outputs Yes Yes Discrete I/O BMXDD01602 16x transistor source 0.5 A di	Discrete I/O	BMXDAI1615	16x 200240 V AC isolated discrete inputs	Yes	Yes
Discrete I/O BMXDD11602H Ruggedized 16x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD11603 16x 48 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD1403H Ruggedized 16x 48 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202H Ruggedized 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD14022H Ruggedized 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDDR40805 & Xan voic Sink discrete inputs Yes Yes Discrete I/O BMXDR40805H Ruggedized 8x non-isolated relay outputs Yes Yes Discrete I/O BMXDR40805H Ruggedized 8x isolated relay outputs Yes Yes Discrete I/O BMXDD01602L Ruggedized 16x transistor soure 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD01602H Ruggedized 16x transistor soure 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD01602H <t< td=""><td>Discrete I/O</td><td>BMXDAI1615H</td><td>Ruggedized 16x 200240 V AC isolated discrete inputs</td><td>Yes</td><td>Yes</td></t<>	Discrete I/O	BMXDAI1615H	Ruggedized 16x 200240 V AC isolated discrete inputs	Yes	Yes
Discrete I/O BMXDD1603 16x 48 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202H Ruggedized 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD16402K 64x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDRA0805H Ruggedized 8x non-isolated relay outputs Yes Yes Discrete I/O BMXDRA0815 8x non-isolated relay outputs Yes Yes Discrete I/O BMXDRA0815H Ruggedized 8x isolated relay outputs Yes Yes Discrete I/O BMXDRA0815H Ruggedized 16x isolated relay outputs Yes Yes Discrete I/O BMXDD01602 16x transistor source 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD01612 Ruggedized 16x transistor sink 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD01612H Ruggedized 16x discrete relay outputs	Discrete I/O	BMXDDI1602	16x 24 V DC sink discrete inputs	Yes	Yes
Discrete I/O BMXDD1403H Ruggedized 16x 48 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202H Ruggedized 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD14202H Ruggedized 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD1402H 64x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDRA0805H Ruggedized 8x non-isolated relay outputs Yes Yes Discrete I/O BMXDRA0805H Ruggedized 8x non-isolated relay outputs Yes Yes Discrete I/O BMXDRA0805H Ruggedized 8x non-isolated relay outputs Yes Yes Discrete I/O BMXDD1602H Ruggedized 8x isolated relay outputs Yes Yes Discrete I/O BMXDD01602H Ruggedized 16x transistor source 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD01612 16x transistor sink 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD01612 Rugged	Discrete I/O	BMXDDI1602H	Ruggedized 16x 24 V DC sink discrete inputs	Yes	Yes
Discrete I/O BMXDD13202 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202H Ruggedized 32x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD13202K 64x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDD18402K 64x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDRA8056 8x non-isolated relay outputs Yes Yes Discrete I/O BMXDRA0815 8x isolated relay outputs Yes Yes Discrete I/O BMXDD01602 16x transistor source 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD01602H Ruggedized 16x transistor source 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD01612H Ruggedized 16x transistor source 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD01612H Ruggedized 16x transistor sink 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD01612H Ruggedized 16x transistor source 0.5 A discrete outputs Yes Yes Discrete I/O BMXDA16051	Discrete I/O	BMXDDI1603	16x 48 V DC sink discrete inputs	Yes	Yes
Discrete I/O BMXDD13202H Ruggedized 32x 24 V DC sink discrete inputs Yes Yes Yes Discrete I/O BMXDD1402X 64x 24 V DC sink discrete inputs Yes Yes Yes Discrete I/O BMXDD16402K 64x 24 V DC sink discrete inputs Yes Yes Yes Discrete I/O BMXDRA0805H Ruggedized 8x non-isolated relay outputs Yes Yes Yes Discrete I/O BMXDRA0805H Ruggedized 8x non-isolated relay outputs Yes Yes Yes Discrete I/O BMXDRA0805H Ruggedized 8x isolated relay outputs Yes Yes Yes Discrete I/O BMXDRA0805H Ruggedized 8x isolated relay outputs Yes Yes Yes Discrete I/O BMXDRA0815H Ruggedized 8x isolated relay outputs Yes Yes Yes Discrete I/O BMXDD01602H Ruggedized 8x isolated relay outputs Yes Yes Yes Discrete I/O BMXDD01602H Ruggedized 16x transistor source 0.5 A discrete outputs Yes Yes Yes Discrete I/O BMXDD016121 16x transistor source 0.5 A discrete outputs Yes Yes Yes Discrete I/O BMXDD01612H Ruggedized 16x transistor sink 0.5 A discrete outputs Yes Yes Yes Discrete I/O BMXDD01612H Ruggedized 16x transistor sink 0.5 A discrete outputs Yes Yes Yes Discrete I/O BMXDD01612H Ruggedized 16x discrete relay outputs Yes Yes Yes Discrete I/O BMXDD01612H Ruggedized 16x discrete relay outputs Yes Yes Yes Discrete I/O BMXDD01615 16x 100240 VAC triac outputs Yes Yes Yes Discrete I/O BMXDA01605 16x 100240 VAC triac outputs Yes Yes Yes Discrete I/O BMXDA01615 16x 24240 VAC triac outputs Yes Yes Yes Discrete I/O BMXDA01615 16x 24240 VAC triac outputs Yes Yes Yes Discrete I/O BMXDA01615 16x 24240 VAC triac outputs Yes Yes Yes Discrete I/O BMXDA01615 16x 24240 VAC triac outputs Yes Yes Yes Discrete I/O BMXDA02022 32x transistor source 0.5 A discrete outputs Yes Yes Discrete I/O BMXDA02022 32x transistor source 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD03202 32x transistor source 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD04602K 64x transistor source 0.5 A discrete outputs Yes Yes Discrete I/O BMXDD016025 8x 24 V DC discrete inputs, 8x discrete relay outputs Yes Yes Discrete I/O BMXDD016022H Ruggedized 8x 24 V DC discrete inputs, 8x	Discrete I/O	BMXDDI1603H	Ruggedized 16x 48 V DC sink discrete inputs	Yes	Yes
Discrete I/O BMXDDI3202/K 32x24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDDI6402/K 64x 24 V DC sink discrete inputs Yes Yes Discrete I/O BMXDRA0805 8x non-isolated relay outputs Yes Yes Discrete I/O BMXDRA08051 Ruggedized 8x non-isolated relay outputs Yes Yes Discrete I/O BMXDRA08151 8x isolated relay outputs Yes Yes Discrete I/O BMXDRA08151 Ruggedized 8x isolated relay outputs Yes Yes Discrete I/O BMXDDO16021 16x transistor source 0.5 A discrete outputs Yes Yes Discrete I/O BMXDDO1612 16x transistor source 0.5 A discrete outputs Yes Yes Discrete I/O BMXDDA01612 16x transistor sink 0.5 A discrete outputs Yes Yes Discrete I/O BMXDRA1605 16x discrete relay outputs Yes Yes Discrete I/O BMXDRA1605 16x discrete relay outputs Yes Yes Discrete I/O BMXDRA1605 16x discrete relay outputs Yes Yes	Discrete I/O	BMXDDI3202	32x 24 V DC sink discrete inputs	Yes	Yes
Discrete I/OBMXDDI6402K64x 24 V DC sink discrete inputsYesYesDiscrete I/OBMXDRA08058x non-isolated relay outputsYesYesDiscrete I/OBMXDRA0805HRuggedized 8x non-isolated relay outputsYesYesDiscrete I/OBMXDRA08158x isolated relay outputsYesYesDiscrete I/OBMXDRA0815HRuggedized 8x isolated relay outputsYesYesDiscrete I/OBMXDDO160216x transistor source 0.5A discrete outputsYesYesDiscrete I/OBMXDDO1612HRuggedized 16x transistor source 0.5A discrete outputsYesYesDiscrete I/OBMXDDO1612HRuggedized 16x transistor source 0.5A discrete outputsYesYesDiscrete I/OBMXDDO1612HRuggedized 16x transistor sink 0.5A discrete outputsYesYesDiscrete I/OBMXDRA180516x discrete relay outputsYesYesDiscrete I/OBMXDRA180516x discrete relay outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x 100240 VAC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 32x transistor source 0.5A discrete outputsYesYesDiscrete I/OBMXDA0201615HRuggedized 32x transistor source	Discrete I/O	BMXDDI3202H	Ruggedized 32x 24 V DC sink discrete inputs	Yes	Yes
Discrete I/OBMXDRA0805&x non-isolated relay outputsYesYesDiscrete I/OBMXDRA0805HRuggedized &x non-isolated relay outputsYesYesDiscrete I/OBMXDRA0815&x isolated relay outputsYesYesDiscrete I/OBMXDDA0815HRuggedized &x isolated relay outputsYesYesDiscrete I/OBMXDD0160216x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD01602HRuggedized 16x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD0161216x transistor sink 0.5 A discrete outputsYesYesDiscrete I/OBMXDD01612HRuggedized 16x transistor sink 0.5 A discrete outputsYesYesDiscrete I/OBMXDRA1605HRuggedized 16x transistor sink 0.5 A discrete outputsYesYesDiscrete I/OBMXDRA1605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x 100240 VAC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 32x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDA01615HRuggedized 32x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDA01615HRuggedized 32x transistor source 0.5 A discrete outputsYesYesDis	Discrete I/O	BMXDDI3202K	32x 24 V DC sink discrete inputs	Yes	Yes
Discrete I/OBMXDRA0806HRuggedized 8x non-isolated relay outputsYesYesDiscrete I/OBMXDRA08158x isolated relay outputsYesYesDiscrete I/OBMXDDA0815HRuggedized 8x isolated relay outputsYesYesDiscrete I/OBMXDD0160216x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD01602HRuggedized 16x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD0161216x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD0161216x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD01612Ruggedized 16x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDRA1605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDA0160516x 100240 VAC triac outputsYesYesDiscrete I/OBMXDA0160516x 100240 VAC triac outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDD03202HRuggedized 32x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD04602K64x transistor source 0.1 A discrete outputsYesYesDiscrete I/OBMXDD04602FRx 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDD04602F<	Discrete I/O	BMXDDI6402K	64x 24 V DC sink discrete inputs	Yes	Yes
Discrete I/OBMXDRA08158x isolated relay outputsYesYesYesDiscrete I/OBMXDDO160216x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD0160216x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD01602HRuggedized 16x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD01612HRuggedized 16x transistor sink 0.5 A discrete outputsYesYesDiscrete I/OBMXDRA160516x discrete relay outputsYesYesDiscrete I/OBMXDRA1605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x 100240 VAC triac outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDD03202HRuggedized 32x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD03202HRuggedized 32x transistor source 0.1 A discrete outputsYesYesDiscrete I/OBMXDD04602K64x transistor source 0.1 A discrete relay outputsYesYesDiscrete I/OBMXDD04602FHRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYes	Discrete I/O	BMXDRA0805	8x non-isolated relay outputs	Yes	Yes
Discrete I/OBMXDRA0815HRuggedized 8x isolated relay outputsYesYesDiscrete I/OBMXDDO160216x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO1602HRuggedized 16x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO1612HRuggedized 16x transistor sink 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO1612HRuggedized 16x transistor sink 0.5 A discrete outputsYesYesDiscrete I/OBMXDRA160516x discrete relay outputsYesYesDiscrete I/OBMXDRA1605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDA0160516x 100240 VAC triac outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDDO3202HRuggedized 32x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD016025HRuggedized 32x transistor source 0.1 A discrete relay outputsYesYesDiscrete I/OBMXDD016025HRuggedized 32x transistor source 0.1 A discrete relay outputsYesYesDiscrete I/OBMXDD016025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputs <td>Discrete I/O</td> <td>BMXDRA0805H</td> <td>Ruggedized 8x non-isolated relay outputs</td> <td>Yes</td> <td>Yes</td>	Discrete I/O	BMXDRA0805H	Ruggedized 8x non-isolated relay outputs	Yes	Yes
Discrete I/OBMXDD0160216x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD01602HRuggedized 16x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD01612HRuggedized 16x transistor sink 0.5 A discrete outputsYesYesDiscrete I/OBMXDD01612HRuggedized 16x transistor sink 0.5 A discrete outputsYesYesDiscrete I/OBMXDDA160516x discrete relay outputsYesYesDiscrete I/OBMXDAA1605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDAA1605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDAA1605HRuggedized 16x 100240 VAC triac outputsYesYesDiscrete I/OBMXDAO1605HRuggedized 16x 100240 VAC triac outputsYesYesDiscrete I/OBMXDAO161516x 24240 VAC triac outputsYesYesDiscrete I/OBMXDAO1615HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDAO1615HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDDO320232x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD0406402K64x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD016025HRuggedized 32x transistor source 0.5 A discrete relay outputsYesYesDiscrete I/OBMXDD016025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYes<	Discrete I/O	BMXDRA0815	8x isolated relay outputs	Yes	Yes
Discrete I/OBMXDDO1602HRuggedized 16x transistor source 0.5 Å discrete outputsYesYesDiscrete I/OBMXDDO161216x transistor sink 0.5 Å discrete outputsYesYesDiscrete I/OBMXDDO1612HRuggedized 16x transistor sink 0.5 Å discrete outputsYesYesDiscrete I/OBMXDRA160516x discrete relay outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x 100240 VAC triac outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x 100240 VAC triac outputsYesYesDiscrete I/OBMXDAO1605HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDAO161516x 24240 VAC triac outputsYesYesDiscrete I/OBMXDAO1615HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDDO320232x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO40402K64x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDDM160258x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state	Discrete I/O	BMXDRA0815H	Ruggedized 8x isolated relay outputs	Yes	Yes
Discrete I/OBMXDDD161216x transistor sink 0.5 A discrete outputsYesYesDiscrete I/OBMXDDA160516x discrete relay outputsYesYesDiscrete I/OBMXDA160516x discrete relay outputsYesYesDiscrete I/OBMXDA1605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x 100240 VAC triac outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x 100240 VAC triac outputsYesYesDiscrete I/OBMXDA0161516x 24240 VAC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 16x 24240 VAC triac outputsYesYesDiscrete I/OBMXDD0320232x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD03202HRuggedized 32x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD04602K64x transistor source 0.1 A discrete outputsYesYesDiscrete I/OBMXDD016025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYe	Discrete I/O	BMXDDO1602	16x transistor source 0.5 A discrete outputs	Yes	Yes
Discrete I/OBMXDD01612HRuggedized 16x transistor sink 0.5 A discrete outputsYesYesDiscrete I/OBMXDRA160516x discrete relay outputsYesYesYesDiscrete I/OBMXDRA1605HRuggedized 16x discrete relay outputsYesYesYesDiscrete I/OBMXDA0160516x 100240 V AC triac outputsYesYesYesDiscrete I/OBMXDA01605HRuggedized 16x 100240 V AC triac outputsYesYesYesDiscrete I/OBMXDA01605HRuggedized 16x 24240 V AC triac outputsYesYesYesDiscrete I/OBMXDA0161516x 24240 V AC triac outputsYesYesYesDiscrete I/OBMXDD0320232x transistor source 0.5 A discrete outputsYesYesYesDiscrete I/OBMXDD03202HRuggedized 32x transistor source 0.5 A discrete outputsYesYesYesDiscrete I/OBMXDD0402K64x transistor source 0.1 A discrete relay outputsYesYesYesDiscrete I/OBMXDD016025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesYesDiscrete I/OBMXDD116025HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesYesDiscrete I/OBMXDD116022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesYesDiscrete I/OBMXDD116022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesYesDiscrete I/OBMXDD	Discrete I/O	BMXDDO1602H	Ruggedized 16x transistor source 0.5 A discrete outputs	Yes	Yes
Discrete I/OBMXDRA160516x discrete relay outputsYesYesDiscrete I/OBMXDRA1605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDAO160516x 100240 V AC triac outputsYesYesDiscrete I/OBMXDAO1605HRuggedized 16x 100240 V AC triac outputsYesYesDiscrete I/OBMXDAO1605HRuggedized 16x 100240 V AC triac outputsYesYesDiscrete I/OBMXDAO161516x 24240 V AC triac outputsYesYesDiscrete I/OBMXDAO1615HRuggedized 16x 24240 V AC triac outputsYesYesDiscrete I/OBMXDDO320232x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO40402K64x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDM160258x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 32 transistor source 0.1 A discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discre	Discrete I/O	BMXDDO1612	16x transistor sink 0.5 A discrete outputs	Yes	Yes
Discrete I/OBMXDRA1605HRuggedized 16x discrete relay outputsYesYesDiscrete I/OBMXDA0160516x 100240 V AC triac outputsYesYesDiscrete I/OBMXDA01605HRuggedized 16x 100240 V AC triac outputsYesYesDiscrete I/OBMXDA0161516x 24240 V AC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 16x 24240 V AC triac outputsYesYesDiscrete I/OBMXDA01615HRuggedized 16x 24240 V AC triac outputsYesYesDiscrete I/OBMXDD0320232x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD03202HRuggedized 32x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDD06402K64x transistor source 0.1 A discrete outputsYesYesDiscrete I/OBMXDDM160258x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM3202K16x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesDiscrete I/OBMXDD	Discrete I/O	BMXDDO1612H	Ruggedized 16x transistor sink 0.5 A discrete outputs	Yes	Yes
Discrete I/OBMXDAO160516x 100240 V AC triac outputsYesYesDiscrete I/OBMXDAO1605HRuggedized 16x 100240 V AC triac outputsYesYesDiscrete I/OBMXDAO161516x 24240 V AC triac outputsYesYesDiscrete I/OBMXDAO1615HRuggedized 16x 24240 V AC triac outputsYesYesDiscrete I/OBMXDDO320232x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO3202HRuggedized 32x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO6402K64x transistor source 0.1 A discrete outputsYesYesDiscrete I/OBMXDDM160258x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYesDiscrete I/OBMXDDM3202K16x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesDiscrete I/OBMXDDM3202K16x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesExpertBMXEHC08008 high-speed counter channelsYesYesYes	Discrete I/O	BMXDRA1605	16x discrete relay outputs	Yes	Yes
Discrete I/OBMXDAO1605HRuggedized 16x 100240 V AC triac outputsYesYesDiscrete I/OBMXDAO161516x 24240 V AC triac outputsYesYesDiscrete I/OBMXDAO1615HRuggedized 16x 24240 V AC triac outputsYesYesDiscrete I/OBMXDDO320232x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO3202HRuggedized 32x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO6402K64x transistor source 0.1 A discrete outputsYesYesDiscrete I/OBMXDDM160258x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYesDiscrete I/OBMXDDM3202K16x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesDiscrete I/OBMXDDM3202K16x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesExpertBMXEHC08008 high-speed counter channelsYesYesYes <td>Discrete I/O</td> <td>BMXDRA1605H</td> <td>Ruggedized 16x discrete relay outputs</td> <td>Yes</td> <td>Yes</td>	Discrete I/O	BMXDRA1605H	Ruggedized 16x discrete relay outputs	Yes	Yes
Discrete I/OBMXDAO161516x 24240 V AC triac outputsYesYesDiscrete I/OBMXDAO1615HRuggedized 16x 24240 V AC triac outputsYesYesDiscrete I/OBMXDDO320232x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO3202HRuggedized 32x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO6402K64x transistor source 0.1 A discrete outputsYesYesDiscrete I/OBMXDDM160258x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM160228x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesDiscrete I/OBMXDDM3202K16x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesExpertBMXEHC08008 high-speed counter channelsYesYesYes	Discrete I/O	BMXDAO1605	16x 100240 V AC triac outputs	Yes	Yes
Discrete I/OBMXDAO1615HRuggedized 16x 24240 V AC triac outputsYesYesDiscrete I/OBMXDDO320232x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO3202HRuggedized 32x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO6402K64x transistor source 0.1 A discrete outputsYesYesDiscrete I/OBMXDDM160258x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM160228x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM160228x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYesDiscrete I/OBMXDDM3202K16x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesDiscrete I/OBMXDDM3202K16x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesExpertBMXEHC08008 high-speed counter channelsYesYesYes	Discrete I/O	BMXDAO1605H	Ruggedized 16x 100240 VAC triac outputs	Yes	Yes
Discrete I/OBMXDDO320232x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO3202HRuggedized 32x transistor source 0.5 A discrete outputsYesYesDiscrete I/OBMXDDO6402K64x transistor source 0.1 A discrete outputsYesYesDiscrete I/OBMXDDM160258x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid stateYesYesDiscrete I/OBMXDDM3202K16x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesDiscrete I/OBMXDDM3202K16x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesExpertBMXEHC08008 high-speed counter channelsYesYesYes	Discrete I/O	BMXDAO1615	16x 24240 V AC triac outputs	Yes	Yes
Discrete I/OBMXDDO3202HRuggedized 32x transistor source 0.5 Å discrete outputsYesYesDiscrete I/OBMXDDO6402K64x transistor source 0.1 Å discrete outputsYesYesDiscrete I/OBMXDDM160258x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesDiscrete I/OBMXDDM3202K16x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesExpertBMXEHC08008 high-speed counter channelsYesYesYes	Discrete I/O	BMXDAO1615H	Ruggedized 16x 24240 V AC triac outputs	Yes	Yes
Discrete I/OBMXDD06402K64x transistor source 0.1 A discrete outputsYesYesDiscrete I/OBMXDDM160258x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16025HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete relay outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputsYesYesDiscrete I/OBMXDDM16022HRuggedized 8x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesDiscrete I/OBMXDDM3202K16x 24 V DC discrete inputs, 16x discrete solid state outputsYesYesExpertBMXEHC08008 high-speed counter channelsYesYesYes	Discrete I/O	BMXDDO3202	32x transistor source 0.5 A discrete outputs	Yes	Yes
Discrete I/O BMXDDM16025 8x 24 V DC discrete inputs, 8x discrete relay outputs Yes Yes Discrete I/O BMXDDM16025H Ruggedized 8x 24 V DC discrete inputs, 8x discrete relay outputs Yes Yes Discrete I/O BMXDDM16022 8x 24 V DC discrete inputs, 8x discrete relay outputs Yes Yes Discrete I/O BMXDDM16022 8x 24 V DC discrete inputs, 8x discrete solid state outputs Yes Yes Discrete I/O BMXDDM16022H Ruggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputs Yes Yes Discrete I/O BMXDDM16022H Ruggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputs Yes Yes Discrete I/O BMXDDM3202K 16x 24 V DC discrete inputs, 16x discrete solid state outputs Yes Yes Expert BMXEHC0800 8 high-speed counter channels Yes Yes Yes	Discrete I/O	BMXDDO3202H	Ruggedized 32x transistor source 0.5 A discrete outputs	Yes	Yes
Discrete I/O BMXDDM16025H Ruggedized 8x 24 V DC discrete inputs, 8x discrete relay outputs Yes Yes Discrete I/O BMXDDM16022 8x 24 V DC discrete inputs, 8x discrete relay outputs Yes Yes Discrete I/O BMXDDM16022H Ruggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputs Yes Yes Discrete I/O BMXDDM16022H Ruggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputs Yes Yes Discrete I/O BMXDDM3202K 16x 24 V DC discrete inputs, 16x discrete solid state outputs Yes Yes Expert BMXEHC0800 8 high-speed counter channels Yes Yes Yes	Discrete I/O	BMXDDO6402K	64x transistor source 0.1 A discrete outputs	Yes	Yes
Discrete I/O BMXDDM16022 8x 24 V DC discrete inputs, 8x discrete solid state outputs Yes Yes Discrete I/O BMXDDM16022H Ruggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputs Yes Yes Discrete I/O BMXDDM3202K 16x 24 V DC discrete inputs, 16x discrete solid state outputs Yes Yes Discrete I/O BMXDDM3202K 16x 24 V DC discrete inputs, 16x discrete solid state outputs Yes Yes Expert BMXEHC0800 8 high-speed counter channels Yes Yes	Discrete I/O	BMXDDM16025	8x 24 V DC discrete inputs, 8x discrete relay outputs	Yes	Yes
Discrete I/O BMXDDM16022H Ruggedized 8x 24 V DC discrete inputs, 8x discrete solid state outputs Yes Yes Discrete I/O BMXDDM3202K 16x 24 V DC discrete inputs, 16x discrete solid state outputs Yes Yes Expert BMXEHC0800 8 high-speed counter channels Yes Yes	Discrete I/O	BMXDDM16025H	Ruggedized 8x 24 V DC discrete inputs, 8x discrete relay outputs	Yes	Yes
Discrete I/O BMXDDM3202K 16x 24 V DC discrete inputs, 16x discrete solid state outputs Yes Yes Expert BMXEHC0800 8 high-speed counter channels Yes Yes	Discrete I/O	BMXDDM16022	8x 24 V DC discrete inputs, 8x discrete solid state outputs	Yes	Yes
Expert BMXEHC0800 8 high-speed counter channels Yes Yes	Discrete I/O	BMXDDM16022H		Yes	Yes
	Discrete I/O	BMXDDM3202K	16x 24 V DC discrete inputs, 16x discrete solid state outputs	Yes	Yes
Expert BMXEHC0800H Ruggedized 8 high-speed counter channels Yes Yes	Expert	BMXEHC0800	8 high-speed counter channels	Yes	Yes
	Expert	BMXEHC0800H	Ruggedized 8 high-speed counter channels	Yes	Yes

List of Modicon Edge I/O NTS compatible with Simplex Soft dPAC (Linux OS) **Type Reference** Reference Description NIM & Bus Extender NTSCNEC1200K Network interface module + Base + Termination, EtherNet/IP, Modbus TCP, 100 Mbps, 2 RJ46 NTSCNEC1200K NIM & Bus Extender Network interface module + Base + Termination, EtherNet/IP, Modbus TCP, 100 Mbps, 2 RJ46 NTSPFD1002HK Power supply module + Base, 24V DC, Field, Hardened Power Supply **Power Supply** NTSPFB1002HK Power supply module + Base, 24V DC, Bus and Field, Hardened Discrete I/O NTSDDI1602XK Discrete input module + Base, 16 In, 24 V DC, Sink, 1/2/3 Wires Discrete I/O NTSDDI1602XHK Discrete input module + Base, 16 In, 24 V DC, Sink, 1/2/3 Wires, Hardened Discrete output module + Base, 8 Out, 24 V DC, 2A, Source, Protected, External Supply, 1 Wire NTSDD00802K Discrete I/O NTSAMI0400K Analog I/O Analog input module + Base, 4 In, Current, Voltage, 2 Wires NTSAMO0400K Analog output module + Base, 4 Out, Current, Voltage Analog I/O Analog I/O NTSAMO0400HK Analog output module + Base, 4 Out, Current, Voltage, Hardened

Compatibility (continued)

Industrial automation

EcoStruxure Automation Expert Product compatibility according to dPAC platform

Туре	Reference	Description		
Discrete I/O	TM3DI16/TM3DI16G	16 discrete inputs		
Discrete I/O	TM3DI32K	32 discrete inputs, HE10 connection		
Discrete I/O	TM3DI8/TM3DI8A/TM3DI8G	8 discrete inputs		
Discrete I/O	TM3DQ8T/TM3DQ8TG	8x 0.5 A transistor source discrete outputs		
Discrete I/O	TM3DQ16T/TM3DQ16TG	16x 0.5 A transistor source discrete outputs		
Discrete I/O	TM3DQ16R/TM3DQ16RG	16x 2 A discrete relay outputs		
Discrete I/O	TM3DQ32TK	32x 0.1 A transistor source discrete outputs, HE10 connection		
Discrete I/O	TM3DQ8U/TM3DQ8UG	8x 0.3 A transistor sink discrete outputs		
Discrete I/O	TM3DQ16U/TM3DQ16UG	16x 0.3 A transistor sink discrete outputs		
Discrete I/O	TM3DQ32UK	32x 0.4 A transistor sink discrete outputs, HE10 connection		
Analog I/O	TM3AI2H/TM3AI2HG	2 high-resolution analog inputs, +-10 V, 0-10 V, 0-20 mA, 4-20 mA, 16-bit, 1 ms		
Analog I/O	TM3AI4/TM3AI4G	4 analog inputs, +-10 V, 0-10 V, 0-20 mA, 4-20 mA, 12-bit, 1 ms		
Analog I/O	TM3AI8/TM3AI8G	8 analog inputs, +-10 V, 0-10 V, 0-20 mA, 4-20 mA, 12-bit, 1 ms		
Analog I/O	TM3AQ2/TM3AG2G	2 analog outputs, +-10 V, 0-10 V, 0-20 mA, 4-20 mA, 12-bit, 1 ms		
Analog I/O	TM3AQ4/TM3AQ4G	4 analog inputs, +-10 V, 0-10 V, 0-20 mA, 4-20 mA, 12-bit, 1 ms		
Safety I/O	TM3SAC5R/TM3SAC5RG	CAT3 Safety, 1 function, max. PL d/SIL3, 3 outputs 6 A relays		
Safety I/O	TM3SAF5R/TM3SAF5RG	CAT4 Safety, 1 function, max. PL e/SIL3, 3 outputs 6 A relays		
Safety I/O	TM3SAFL5R/TM3SAFL5RG	CAT3 Safety, 2 functions, max. PL d/SIL3, 3 outputs 6 A relays		
Safety I/O	TM3SAK6R/TM3SAK6RG	CAT4 Safety, 3 functions, max. PL e/SIL3, 3 outputs 6 A relays		
Mixed analog I/O	TM3AM6/TM3AM6G	4 analog outputs, 2 analog inputs, +-10 V, 0-10 V, 0-20 mA, 4-20 mA, 12-bit, 1 ms		
Thermocouple mixed	ТМЗТМЗ/ТМЗТМЗС	2 temperature inputs + 1 analog output TC (J, K, R, S, B, T, N, E, C, L), RTD (NI100, NI1000, PT100, PT1000) (+-10 V, 0-10 V) (0-20 mA, 4-20 mA) 16-bit, 100 ms		
Thermocouple input	TM3TI4/TM3TI4G	4 temperature inputs TC (J, K, R, S, B, T, N, E, C, L) RTD (NI100, NI1000, PT100, PT1000), (+-10 V, 0-10 V) (0-20 mA, 4-20 mA) 16-bit, 100 ms		
Thermocouple input	TM3TI8T/TM3TI8TG	8 temperature inputs, NTC, PTC, and TC (J, K, R, S, B, T, N, E, C, L), 16-bit 100 ms		
Relay I/O	TM3DM8R/TM3DM8RG	8x 2 A relay outputs		
Relay I/O	TM3DM24R/TM3DM24RG	24x 2 A relay outputs		
Relay I/O	TM3DQ8R/TM3DQ8RG	8x 2 A relays outputs		
Other	TM3XREC1	TM3 remote receiver module		
Other	TM3XTRA1	TM3 remote transmitter module		
Other	TM3XTYS4	TM3 parallel interface for 4 Tesys motor starters		
Expert	TM3XHSC202/TM3XHSC202G	High-speed counting, 2 HSC channels, 10 inputs, 8 outputs		

Compatibility (continued)

Industrial automation

EcoStruxure Automation Expert Product compatibility according to dPAC platform

Туре	Reference	Description	Compatible
Drive	ATV340eeeN4	Altivar Machine drives	Yes
Drive	ATV340●●●N4E ≤ D22	Altivar Machine drives	No
Drive	ATV340●●●N4E ≥ D30	Altivar Machine drives	Yes
Drive	ATV630 ●●●● ATV630 ●●●● F	Altivar Process drives	Yes
Drive	ATV650●●●● ATV650●●●●E ATV650●●●●●F	Altivar Process drives	Yes
Drive	ATV930 ATV930 ATV930 ATV930	Altivar Process drives	Yes
Drive	ATV950●●●● ATV950●●●●E ATV950●●●●●F	Altivar Process drives	Yes
Drive	ATV660	Altivar Process drive systems	Yes
Drive	ATV960	Altivar Process drive systems	Yes
Drive	ATV99	Altivar Process drive systems	Yes
Drive	ATV6A0	Altivar Process Modular drives	Yes
Drive	ATV9A0	Altivar Process Modular drives	Yes
Drive	ATV6L0	Altivar Process liquid-cooled drives	Yes
Other	VW3A1111	Graphic display terminal	Yes
Other	VW3A1112	Door mounting kit	Yes
Vixed I/O	VW3A3203	Extended I/O module - 6 digital inputs/ 2 digital outputs/2 analog inputs	Yes
Mixed I/O	VW3A3204	Extended relay module - 3 relay outputs	Yes
Encoder	VW3A3420	Digital encoder interface module for Altivar 340 and Altivar 900 variable speed drives	Yes
Encoder	VW3A3422	Analog encoder interface module for Altivar 340 and Altivar 9 • variable speed drives	Yes
Encoder	VW3A3423	Resolver interface module for Altivar 340 and Altivar 900 variable speed drives	Yes
Encoder	VW3A3424	HTL encoder interface module for Altivar 340 and Altivar 9 variable speed drives	Yes

References

Industrial automation systems

EcoStruxure Automation Expert Modicon M580 dPAC



BMED581020

Modicon M580 dPAC				
Local I/O capacity	Communication	Service ports	Reference	Weight
	ports			kg/ <i>lb</i>
Up to 1408 discrete I/O	2	1	BMED581020	0.848/
Up to 352 analog I/O			BMED581020C	1.872
64 MB integrated memory				

Standards and certifications

The Modicon M580 dPAC automation platform has been developed to comply with the principal national and international standards concerning electronic equipment for industrial automation systems.

- Requirements specific to programmable controllers: functional characteristics, immunity, resistance, etc.: IEC/EN 61131-2 and IEC/EN/UL/CSA 61010-2-201
- Requirements specific to power utility automation systems: IEC/EN 61000-6-5, IEC/EN 61850-3 (with installation restrictions)
- Requirements specific to railway applications: EN 50155/IEC 60571 (with installation restrictions)
- Ex areas:
- □ For USA and Canada: Hazardous location class I, division 2, groups A, B, C, and D
- □ For other countries: CE ATEX (2014/34/EU) or IECEx in defined atmosphere Zone 2 (gas) and/or Zone 22 (dust)
- Merchant navy requirements of the major international organizations: unified in IACS (International Association of Classification Societies)
- Compliance with European Directives for CE marking:
- □ Low voltage: 2014/35/EU
- □ Electromagnetic compatibility: 2014/30/EU
- □ Machinery: 2006/42/EC

Up-to-date information on which certifications have been obtained is available on our website.

Modicon M580 dPACs are considered as open equipment and are designed for use in industrial environments, in pollution degree 2, overvoltage category II (IEC 60664-1), and in low-voltage installations, where the main power branch is protected on both wires by devices such as fuses or circuit breakers limiting the current to 15 A for North America and 16 A for the rest of the world.

Characteristics

Service conditions and recomme	ndations relating to the envi	ronment

		Modicon M580 automation pla		Modicon M580 d	PAC harsh I/O p	olatform
Temperature	Operation	060 °C/32140 °F -:		-25+70 °C/-13158 °F		
	Storage	-4085 °C/-40.	185 °F	-4085 °C/-401	185 °F	
Relative humidity (without	Cyclical humidity	595% up to 55	5°C/131°F	595% up to 55 °	C/131 °F	
condensation)	Continuous humidity	593% up to 55	5°C/131°F	593% up to 60 °C/140 °F		
Altitude	Operation	02,000 m/06,562 ft (full specification: temperature and isolation) 2,0005,000 m/6,56216,404 ft (temperature derating: approx. 1 °C/40 (33.8 °F/1,312 ft), isolation 150 V/1,000 m (3,281 ft)) For accurate temperature derating calculation, refer to IEC 61131-2 Ec Modicon X80 I/O power supply modules				
		BMXCPS2010	BMXCPS3020 BMXCPS3020H	BMXCPS3540T	BMXCPS2000	BMXCPS3500 BMXCPS3500H BMXCPS4002
Supply voltage	Nominal voltage	24 V 	2448 V 	125 V	100240 V \sim	100240 V \sim
	Limit voltages	1831.2 V ===	1862.4 V	100150 V	85264 V \sim	85264 V \sim
	Nominal frequencies	-	-	-	50/60 Hz	50/60 Hz
	Limit frequencies	-	-	-	47/63 Hz	47/63 Hz

Industrial automation systems

EcoStruxure Automation Expert Modicon M580 dPAC

Protective treatment of the Modicon M580 dPAC automation platform

The Modicon M580 dPAC platform meets the requirements of "TC" treatment (treatment for all climates).

For installations in industrial environments corresponding to "TH" (treatment for hot and humid environments), Modicon M580 dPAC must be housed in enclosures providing at least IP54 protection as specified by standard IEC/EN 60529, or an equivalent level of protection according to NEMA 250.

The Modicon M580 dPAC platform offers protection to IP20 level and protection against access to terminals (enclosed equipment) (1). They can therefore be installed without an enclosure in reserved-access areas that do not exceed pollution level 2 (control room with no dust-producing machine or activity). Pollution level 2 does not take account of more severe environmental conditions: air pollution by dust, smoke, corrosive or radioactive particles, vapors or salts, molds, insects, etc.

(1) A protective cover BMXXEM010 is available for use in case there are any unused slots.

(C€): Tests required by European directives (C€) and based on IEC/EN 61131-2 standards.

Immunity to LF interference (CE)	(1)	
Name of test	Standards	Levels
Voltage and frequency variations	IEC/EN 61131-2; IEC/EN 61000-6-2; IEC 61000-4-11	0.851.10 Un - 0.941.04 Fn; 4 steps t = 30 min
	IACS E10; IEC 61000-4-11	0.80 Un0.90 Fn; 1.20 Un1.10 Fn; t = 1.5 s/5 s
Direct voltage variations	IEC/EN 61131-2; IEC 61000-4-29; IACS E10 (PLC not connected to charging battery)	0.851.2 Un + ripple: 5% peak; 2 steps t = 30 min
Third harmonic	IEC/EN 61131-2	H3 (10% Un), 0°/180°; 2 steps t = 5 min
Voltage interruptions	IEC/EN 61131-2; IEC/EN 61000-6-2; IEC 61000-4-11; IEC 61000-4-29; IACS E10	Power supply immunity: ■ 10 ms for ~ and PS2 (20 ms DS criteria) ■ Check operating mode for longer interruptions up to 5 s, 85% Un ■ For IACS, 3 times 30 s in 5 min, 85% Un
	IEC/EN 61131-2; IEC/EN 61000-6-2; IEC 61000-4-11	For ~ PS2: 20% Un, 10: ½ period 40% Un, cycle 10/12 70% Un, cycle 25/30 0% Un, cycle 250/300
Voltage shut-down and start-up	IEC/EN 61131-2	 Un0Un; t = Un/60 s Umin0Umin; t = Umin/5 s Umin0.9 UdlUmin; t = Umin/60 s
Magnetic field	IEC/EN 61131-2; IEC 61000-4-8 (for MV power stations: IEC 61000-6-5; IEC 61850-3)	Power frequency: 50/60 Hz, 100 A/m continuous1,000 A/m; t = 3 s; 3 axes
	IEC 61000-4-10	Oscillatory: 100 kHz1 MHz, 100 A/m; t = 9 s; 3 axes
Conducted common mode disturbances range 0 Hz150 kHz	IEC 61000-4-16 (for MV power stations: IEC 61000-6-5; IEC 61850-3)	For remote systems: 50/60 Hz and, 300 V, t = 1s 50/60 Hz and, 30 V, t = 1 min 5 Hz150 kHz, sweep 3 V30 For ~: 10 V For: 10 V cont. or 100 V, t = 1 s

Where

PS1 applies to dPAC supplied by battery, PS2 applies to dPAC energized from \sim or = supplies Un: nominal voltage; Fn: nominal frequency; Udl: detection level with power on

(1) Devices must be installed, wired, and maintained in accordance with the instructions provided in the manual "Grounding and Electromagnetic Compatibility of Controllers".

(2) These tests are performed without an enclosure, with devices fixed on a metal grid and wired as per the recommendations in the manual "Grounding and Electromagnetic Compatibility of Controllers"

(C€): Tests required by European directives (C€) and based on IEC/EN 61131-2 standards.
EcoStruxure Automation Expert Modicon Ethernet Remote I/O



BMECRD0100

Modicon CRD, I/O bus o	ver Ethernet for Simple	x/High Availability Soft dPA	C (Linux OS)
RSTP Communication ports	Service ports	Reference	Weight
			kg/ <i>lb</i>
2	1	BMECRD0100	0.848/
		BMECRD0100C	1.872

Standards and certifications

The Modicon CRD platform has been developed to comply with the principal national and international standards concerning electronic equipment for industrial automation systems.

- Requirements specific to programmable controllers: functional characteristics, immunity, resistance, etc.: IEC/EN 61131-2 and IEC/EN/UL/CSA 61010-2-201
- Requirements specific to power utility automation systems: IEC/EN 61000-6-5, IEC/EN 61850-3 (with installation restrictions)
- Requirements specific to railway applications: EN 50155/IEC 60571 (with installation restrictions)
- Ex areas:
- D For USA and Canada: Hazardous location class I, division 2, groups A, B, C, and D
- □ For other countries: CE ATEX (2014/34/EU) or IECEx in defined atmosphere Zone 2 (gas) and/or Zone 22 (dust)
- Merchant navy requirements of the major international organizations: unified in IACS (International Association of Classification Societies)
- Compliance with European Directives for CE marking:
- □ Low voltage: 2014/35/EU
- □ Electromagnetic compatibility: 2014/30/EU
- □ Machinery: 2006/42/EC

Up-to-date information on which certifications have been obtained is available on our website.

Modicon CRD is considered as open equipment and are designed for use in industrial environments, in pollution degree 2, overvoltage category II (IEC 60664-1), and in low-voltage installations, where the main power branch is protected on both wires by devices such as fuses or circuit breakers limiting the current to 15 A for North America and 16 A for the rest of the world.

Characteristics

Service conditions and recommendations relating to the environment

		Modicon CRD a platform	automation	Modicon CRD harsh I/O platform		
Temperature	Operation	060 °C/32140 °F		-25+70 °C/-13158 °F		
	Storage	-4085 °C/-40.	185 °F	-4085 °C/-40185 °F		
Relative humidity (without	Cyclical humidity	595% up to 55 °C/131 °F		595% up to 55 °C/131 °F		
condensation)	Continuous humidity	593% up to 55	5°C/131°F	593% up to 60 °C/ <i>140 °F</i>		
Altitude	Operation	02,000 m/06,562 ft (full specification: temperature and isolation) 2,0005,000 m/6,56216,404 ft (temperature derating: approx. 1 °C/400 m (33.8 °F/1,312 ft), isolation 150 V/1,000 m (3,281 ft)) For accurate temperature derating calculation, refer to IEC 61131-2 Ed 4.0 Anne				
		Modicon X80 I/O power supply n		modules		
		BMXCPS2010	BMXCPS3020 BMXCPS3020H	BMXCPS3540T	BMXCPS2000	BMXCPS3500 BMXCPS3500H BMXCPS4002 BMXCPS4002S BMXCPS4002H
Supply voltage	Nominal voltage	24 V 	2448 V 	125 V ===	100240 V \sim	100240 V \sim
	Limit voltages	1831.2 V ===	1862.4 V 	100150 V	85264 V \sim	85264 V \sim
	Limit voltages Nominal frequencies		1862.4 V	100150 V	85264 V \sim 50/60 Hz	85264 V ~ 50/60 Hz

EcoStruxure Automation Expert Modicon Ethernet Remote I/O

Protective treatment of the Modicon CRD automation platform

The Modicon CRD platform meets the requirements of "TC" treatment (treatment for all climates).

For installations in industrial environments corresponding to "TH" (treatment for hot and humid environments), Modicon CRD must be housed in enclosures providing at least IP54 protection as specified by standard IEC/EN 60529, or an equivalent level of protection according to NEMA 250.

The Modicon CRD platform offers protection to IP20 level and protection against access to terminals (enclosed equipment) (1). They can therefore be installed without an enclosure in reserved-access areas that do not exceed pollution level 2 (control room with no dust-producing machine or activity). Pollution level 2 does not take account of more severe environmental conditions: air pollution by dust, smoke, corrosive or radioactive particles, vapors or salts, molds, insects, etc.

(1) A protective cover BMXXEM010 is available for use in case there are any unused slots.

(C€): Tests required by European directives (C€) and based on IEC/EN 61131-2 standards.

Immunity to LF interference (CE)	(1)	
Name of test	Standards	Levels
Voltage and frequency variations	IEC/EN 61131-2; IEC/EN 61000-6-2; IEC 61000-4-11	0.851.10 Un - 0.941.04 Fn; 4 steps t = 30 min
	IACS E10; IEC 61000-4-11	0.80 Un0.90 Fn; 1.20 Un1.10 Fn; t = 1.5 s/5 s
Direct voltage variations	IEC/EN 61131-2; IEC 61000-4-29; IACS E10 (PLC not connected to charging battery)	0.851.2 Un + ripple: 5% peak; 2 steps t = 30 min
Third harmonic	IEC/EN 61131-2	H3 (10% Un), 0°/180°; 2 steps t = 5 mir
Voltage interruptions	IEC/EN 61131-2; IEC/EN 61000-6-2; IEC 61000-4-11; IEC 61000-4-29; IACS E10	Power supply immunity: ■ 10 ms for ~ and PS2 (20 ms DS criteria) ■ Check operating mode for longer interruptions up to 5 s, 85% Un ■ For IACS, 3 times 30 s in 5 min, 85% Un
	IEC/EN 61131-2; IEC/EN 61000-6-2; IEC 61000-4-11	For ~ PS2: ■ 20% Un, t0: ½ period ■ 40% Un, cycle 10/12 ■ 70% Un, cycle 25/30 ■ 0% Un, cycle 250/300
Voltage shut-down and start-up	IEC/EN 61131-2	 Un0Un; t = Un/60 s Umin0Umin; t = Umin/5 s Umin0.9 UdlUmin; t = Umin/60
Magnetic field	IEC/EN 61131-2; IEC 61000-4-8 (for MV power stations: IEC 61000-6-5; IEC 61850-3)	Power frequency: 50/60 Hz, 100 A/m continuous1,000 A/m; t = 3 s; 3 axes
	IEC 61000-4-10	Oscillatory: 100 kHz1 MHz, 100 A/m; t = 9 s; 3 axes
Conducted common mode disturbances range 0 Hz150 kHz	IEC 61000-4-16 (for MV power stations: IEC 61000-6-5; IEC 61850-3)	For remote systems: 50/60 Hz and, 300 V, t = 1s 50/60 Hz and, 30 V, t = 1 min 5 Hz150 kHz, sweep 3 V30 For: 10 V For: 10 V cont. or 100 V, t = 1 s

Where PS1 applies to dPAC supplied by battery, PS2 applies to dPAC energized from \sim or = supplies Un: nominal voltage; Fn: nominal frequency; Udl: detection level with power on

(1) Devices must be installed, wired, and maintained in accordance with the instructions provided in the manual "Grounding and Electromagnetic Compatibility of Controllers".

(2) These tests are performed without an enclosure, with devices fixed on a metal grid and wired as per the recommendations in the manual "Grounding and Electromagnetic Compatibility of Controllers"

(C€): Tests required by European directives (C€) and based on IEC/EN 61131-2 standards.

References (continued)

Industrial automation systems EcoStruxure Automation Expert Modicon M251 dPAC



Modicon M251 dPAC

Modicon M251 dPAC				
Local I/O capacity	Device ports	Service ports	Reference	Weight kg/ <i>lb</i>
No embedded I/O, supporting Modicon TM3 I/O expansion modules	2	1	TM251MDESE	0.848/ 1.872
Standards and certification	s			
 Standards IEC/EN 61131-2 (Edition 2.2) UL508 ANSI/ISA 12.12.01-2007 CSA C22.2 No. 213 and No. 	,			
■ Certifications □ C€ □ of line Listing Mark				

- □ cULus Listing Mark
- □ RCM
- □ Achilles
- □ UKCA

Environmental characteristic	cs		
Service conditions and reco	mmendations relat	ing to the environment	
Temperature	Operation	Vertical installation: -1035 °C/14122 °F	
		Horizontal installation: -1055 °C/14131 °F	
	Storage	-4070 °C/-40158 °F	
Relative humidity	Operation	1095%	
(without condensation)	Storage		
Altitude	Operation	02,000 m/06,562 ft: complete specification for temperature and exposure	
	Storage	03,000 m (09,842 ft)	
Immunity to mechanical stress	1131	 Rail mounting: 58.4 Hz (amplitude 3.5 mm/0.138 in.) 8.4150 Hz (acceleration 1 g) Panel mounting: 8.7150 Hz (acceleration 3 g) 	
	Merchant Navy	213.2 Hz (amplitude 1.0 mm/ <i>0.039 in.</i>) 13.2100 Hz (acceleration 0.7 g)	
Supply charecteristics			
Power supply		24 V	
Voltage limit	Including ripple	19.228.8 V	
Immunity to micro-cuts	Class PS-2	10 ms	
Max. consumption		45 W	

References (continued)

Industrial automation systems EcoStruxure Automation Expert

TM262L01MDESE8T

Weight

kg/lb 0.655/

1.444

Modicon M262 dPAC

Service ports Reference

1



Modicon M262 dPAC

supporting Modicon TM3 I/O expansion modules	
Standards and certifications	

2

Device ports

Standards

Modicon M262 dPAC

Local I/O capacity

No embedded I/O,

- □ IEC/EN 61131-2 (Edition 2 2007)
- □ UL 61010-1, 61010-2-201 □ ANSI/ISA 12.12.01-2007
- CSA C22.2 No. 213, No. 61010-1, No. 61010-2-201
- Certifications
- □ C€
- □ cULus, cULus HazLoc Class I Division 2 CSA 22-2 No 213
- □ RCM
- □ Achilles
- □ KC □ EAC
- Environmental characteristics

Environmental charac	teristics		
Service conditions an	d recommendatio	ns relating to the environment	
Temperature	Operation	Vertical installation: -2050 °C/-4122 °F	
		Horizontal installation: -2060 °C/-4140 °F	
		Flat mounting: -2045 °C/-4113 °F	
	Storage	-4085 °C/-40185 °F	
Relative humidity (without condensation)	Operation	595%	
	Storage		
Altitude	Operation	02,000 m/06,562 ft	
	Storage	03,000 m (09,842 ft)	
Immunity to mechanical stress		3.5 mm at 28.4 Hz 1 gn at 8.4200 Hz	
Supply charecteristics	6		
Power supply		24 V === (-1520%)	
Voltage limit		20.428.8 V	
Immunity to micro-cuts		0.01 ms	
Max. consumption		82 W	

References (continued)

Industrial automation systems

EcoStruxure Automation Expert Altivar ATV dPAC



Altivar ATV dPAC ATV dPAC module Local I/O capacity **Device ports** Service ports Reference Weight Supporting Altivar Drives 2 VW3A3530D 0.020/ I/O embedded, expansion and encoder modules: Up to 23 discrete I/O Up to 7 analog I/O 12 MB integrated memory

Standards and certifications

Depending on the specific drive type used for ATV dPAC integration, the standards and certifications must be checked in the corresponding ATV340/600/900 manual.

Standards

- □ EN/IEC 61800-3
- □ EN/IEC 61800-5-1
- □ IEC 61000-3-12
- □ IEC 60721-3
- □ IEC 61508
- □ SEMI F47-0706
- □ UL508C and UL61800-5-1
- □ RoHS-2 according to EU directive 2002/95/EC
- REACH according to EU regulation 1907/2006

Certifications

- □ CE
- 🗆 UL
- □ CSA
- □ RCM
- □ EAC
- ATEX
- DNV-GL

Environmental characteristics

Altivar Process and Altivar Machine drives are designed to operate in a variety of environments, including harsh environments. The conditions stated below are general data and must be verified with the respective ATV600, ATV900, and ATV340 manuals for the specific drive type used.

Service conditions and recommendations relating to the environment			
Temperature	Operation	As standard: -1550 °C/+5122 °F	
		With derating: -1560 °C/+5140 °F	
	Storage and transport	-4070 °C/-40158 °F	
Relative humidity (without condensation)	Operation	595%	
	Storage	-	
Altitude	Operation	 01,000 m/03,281 ft without derating 1,0004,800 m/3,28115,700 ft with derating of 1% per 100 m/328 ft 	
Protection of drives		IP20 to IP55	
Withstand to harsh environment		 Chemical class 3C3 conforming to IEC/EN 60721-3-3 Mechanical class 3S3 conforming to IEC/EN 60721-3-3 Printed circuit boards with protective coating 	

Environmental characteristics

Compliance with electromagnetic compatibility requirements has been incorporated into the design of Altivar Process and Altivar Machine drives. They are C€ marked according to the European EMC directive (2014/30/EU).

Note: Depending on the specific drive type used for ATV dPAC integration, the EMC compliance values must be checked in the corresponding ATV340/600/900 manual.

kg/lb

0.044

Industrial automation systems EcoStruxure Automation Expert Altivar ATV dPAC



VW3A1111



VW3A1112





Description	Reference	Weight kg/ <i>lb</i>
o be used with ATV340 ATV600 and ATV900 are equipped with the graphic display terminal as tandard) Display 240 x 160 pixels, 8 lines Real-time clock with 10-year backup battery, to keep time when the drive owered off Protection IP65 to be procured separately for ATV340 delivered as standard with ATV600 and ATV900)	VW3A1111	0.020/ 0.044

Remote mounting kit		
Description	Reference	Weight kg/ <i>lb</i>
Remote mounting kit For remote mounting of graphic display terminal, suitable for ATV340, ATV600, and ATV900 families Protection IP65	VW3A1112	0.020/ 0.044

Remote mounting cordset			
Description	Length (m/ <i>ft</i>)	Reference	Weight kg/ <i>lb</i>
Remote mounting cordset Equipped with 2 RJ45 connectors for connection of	1/ 3.28	VW3A1104R10	0.050/ 0.110
the graphic display terminal to the drive	3/	VW3A1104R30	0.150/
	9.84		0.331
	5/	VW3A1104R50	0.250/
	16.4		0.551
	10/	VW3A1104R100	0.500/
	32.8		1.102
Connector cable			
Description	Length (m/ <i>ft</i>)	Reference	Weight kg/ <i>lb</i>
USB/Mini B USB cable	_	TCSXCNAMUM3P	_

for connecting the display terminal to a PC

Services

Industrial automation systems

	 Schneider Electric offers lifecycle services for your industrial automation systems based on EcoStruxure Automation Expert. Our lifecycle services include field and digital services. We believe, with our advanced processes and tools, we are your trusted expert in field and digital services to help you achieve greater functional safety, efficiency, sustainabilty, and resilience in your plant operations. We offer services that are designed to address your needs as you plan, install, operate, and optimize your industrial automation systems based on EcoStruxure Automation Expert. These include: Consulting services Maintenance and support services Training Services Migration Services For more information, visit our Industrial Automation Services page.
Consulting services	
	Consulting services are about bringing our expertise to help find solutions to some of your key operational challenges. Be it about maximizing the business value from your digital transformation initiatives, identifying improvement opportunities in your industrial automation system lifecycle management plans, or improving your cybersecurity posture and compliance, we can help. Take a look at some of our consulting offerings:
Security consulting	Our cybersecurity consultants will help you assess and review your EcoStruxure Automation Expert systems to detect gaps, identify risks, uncover any security malpractices, assess your staff's security competencies, provide emergency response services, and more. For more information, visit our Cybersecurity Services page.
IA lifecycle consulting	Audits performed by our service team provide insights and recommendations to help improve the maintenance plans of industrial automation assets. This service helps identify potential risks to the reliability and maintainability of these assets and plan mitigation actions. Watch the video to learn more about our IA Lifecyle Consulting Service.
Maintenance and support services	
Maintenance and support services	Our maintenance and support offerings help you quickly restore your operations in the event of an unplanned downtime incident. They can also help reduce the risk of occurrence and the associated costs. Take a look at some of our maintenance and support offerings:
Extended warranty	The extended warranty offer gives you the option to extend the warranty of selected Schneider Electric hardware by up to three years. Note: Please contact your Customer Care Center for offer availability.
Spare parts, exchanges, and repairs	 These solutions help you to respond, in the most optimal manner, to requests for spare parts for your EcoStruxure Automation Expert system based on Schneider Electric hardware. Services include: Parts management service: Onsite or shared spares inventory, managed by us, to help ensure parts availability, while optimizing costs. Repair: Product repairs performed onsite when possible, or at our repair centers. Exchange: A refurbished product is provided in exchange for a product returned with a detected fault. Note: Availability of these services may vary depending on the applicable Schneider Electric hardware. Please contact your Customer Care Center for offer availability.

Maintenance and support services (contin	ued)			
Maintenance and support contracts	Our Support and Maintenance Service Offers, are a simplified and modular annual support services agreements, designed to provide you with the right level of flexibility and confidence to meet your support and maintenance needs for your industrial automation systems based on EcoStruxure Automation Expert.			
	Available as Advantage Service Plan (ASP) for Automation Control or as Custome FIRST (CF) Program for Automation Control, they offer a pre-packaged set of services relevant to operating and maintaining an EcoStruxure Automation Expert Systems. For further customization, a set of optional services are available.			
	The following table provides a snapshot of the plan:			
	Included Comises	Supp	port Levels	
	Included Services	ASP	CF	
		Essential	Primary	
	Core Support and Services			
	Priority Technical Support Access – NBH ^(a)	SLA ^(b)	SLA ^(b)	
	mySchneider Portal Access – Premium support	Yes	Yes	
	Software Version Update ^(c)	Yes	Yes	
	Optional services ^(d)			
	24/7 Priority Technical Support – Phone			
	Block of Support Hours			
	 (a) Normal Business Hours (b) Service Level Agreement (c) Excludes labor and hardware (d) Subject to local availability 			
	With the enhancements to EcoStruxure Automation Exp we will progressively offer a more digital experience for a maintain the currency of their EcoStruxure Automation E experience, customers with our support and maintenand to update, in a self-service mode, their EcoStruxure Autor installation, as and when installations are ready. Please Center for offer availability.	customers se Expert softw ce service off omation Expe	eeking to are. With this ers, will be able ert software	
Application design services				
	Our Application Design Service leverages our extensive systems based on EcoStruxure Automation Expert. This the benefits of software-defined automation while reduc associated with application development. Included services:	service help ing the risks	os you maximize and costs	
	 Remote Application Engineering and implementation assistance by Schneider Electric's experts Service delivered by certified engineers with experience in Automation Expert projects and library development. Typical deliverables: 			
	 Functional design specification Custom library and/or CATs Tested Automation Expert application 			
Training services				
	Our training services are designed for users to take max industrial automation systems based on EcoStruxure Au training catalog includes courses on: Automation fundamentals IEC 61499 concepts EcoStruxure Automation Expert Build Time and confi	utomation Ex		
	For more information, please visit our Learning Service: email.	s Home Page	e or send us an	

Modernization and migration services

Over the years, we have been involved in migrating many major automation systems to Schneider Electric. Our migration services, based on this expertise and complemented by a set of dedicated tools, helps to minimize the risks and costs involved in such upgrades to an open EcoStruxure Automation Expert-based system. The available set of tools and services are outlined below:

Tools and services

		Tools and services				
Source platforms		Reverse engineering	Application conversion service	Wiring systems for Modicon X80		
Schneider Electric	Modicon Premium	Yes	2023	Yes		
Rockwell Automation	SLC 500	Yes	Yes	Yes		
Automation	PLC-5	Yes	Yes	Yes		
	ControlLogix	Yes	2023	_		

In addition to the above, we can also offer project-specific solutions. Please contact your local service teams for more information.

Α		ATV650D11N4E		ATV680C13T4X1	34	ATV6A0C31T6	34
ATV340D11N4	34	ATV650D15N4	34	ATV680C16Q4X1	34	ATV6A0C35Q4	34
ATV340D11N4E	34	ATV650D15N4E	34	ATV680C16T4X1	34	ATV6A0C35Q4	34
ATV340D15N4	34	ATV650D18N4	34	ATV680C20Q4X1	34	ATV6A0C35T4	34
ATV340D15N4E	34	ATV650D18N4E	34	ATV680C20Q4X1	34	ATV6A0C40N6	34
ATV340D18N4	34	ATV650D22N4	34	ATV680C25Q4X1	34	ATV6A0C40Q4	34
ATV340D18N4E	34	ATV650D22N4E	34	ATV680C25C4X1	34	ATV6A0C40Q4	34
ATV340D22N4	34	ATV650D22N4L	34	ATV680C31Q4X1	34	ATV6A0C40Q8	34
ATV340D22N4E	34		34	ATV680C31C4X1	34	ATV6A0C40R4	34
ATV340D22N4E	34	ATV650D30N4E	34		34		34
ATV340D30N4E	34	ATV650D37N4	34	ATV680C35Q4X1	34	ATV6A0C40T6	34
ATV340D37N4E ATV340D45N4E	34	ATV650D37N4E	34	ATV680C35T4X1	34	ATV6A0C45Q4	34
ATV340D45N4E	34	ATV650D45N4		ATV680C40Q4X1		ATV6A0C45R4	
	34	ATV650D45N4E	34	ATV680C40T4X1	34	ATV6A0C45T4	34
ATV340D75N4E	34	ATV650D55N4	34	ATV680C45Q4X1	34	ATV6A0C50N6	34
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