Modicon Quantum platform modernization

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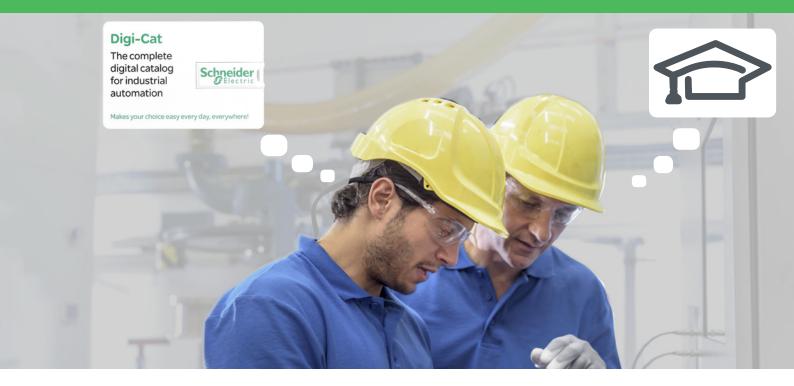
Quick access to Product information

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With just 3 clicks, you can reach the 7,000 pages of the Industrial Automation & Control catalog, in both English and French.

– Digi-Cat is available on a USB key (for PC). To get your Digi-Cat, please contact your local center
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http://www.schneider-electric.com/b2b/en/services/training/technical-training.jsp

then click on **Find your training center**

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General contents

Modicon Quantum platform modernization

Modicon Quantum platform modernization
General presentation

140CRA31200

General presentation

Modicon remote I/Os are incorporated on more than 75,000 S908 busses. Modicon M580 supporting this technology enables a smooth, hassle-free, step-by-step transition from legacy architectures to Ethernet I/O (EIO) architectures with minimum risk, cost and investment.

Scalable and flexible offer

Modicon M580 is a scalable offer that provides unique features :
- Engineering: Same native installed base software integration implementation that is based on popular communication and software industry standards; I/O layout designs for your current & legacy I/O systems
- Commissioning: Simplify the wiring with standardizing 1 type of I/O platform
- Maintenance: Optimized spare parts management
- Operating costs: Shutdowns eliminated with redundancy solutions and online changes

Why modernizing from Modicon Quantum to Modicon M580

Modernization through secure, safe transition allows to overcome:
- Proprietary technologies that prevent network transparency in all aspects
- Obsolete technology processor preventing from improving performances
- Lack of large communication throughput
- Memory limitations as PCMCIA is now obsolete technology
- Harsh environment inadaptability, leaving a large footprint
- Higher costs induced by cybersecurity features that require certified build-in components
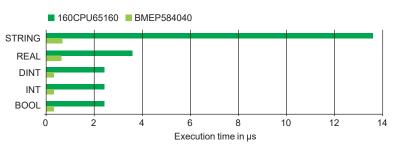
Modernization benefits

Use a simple solution that makes modernization easy.
Modernization from small compact to large scalable architecture solutions allows:
- Higher performance
- Cost control
- Risk and production control
- Safety improvement

Higher performance

Benefit from the latest performances with a typical application that goes 5 to 8 times faster depending on type of processing.
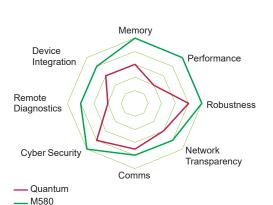

Quantum and M580 performance comparison

M580 is tailored to sustain ever growing data intensive and connected processes.

M580 High End vs Quantum High

Data capability	x3
Communication capabilities	x5
Execution performances	x5
Application memory	x7

Modicon M580 has multitasking even in Hot Standby, event log and embedded HTLM5 website.

Quantum and M580 performance

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Modicon Quantum platform modernization
General presentation

Modernization benefits (continued)
Cost control

You can capitalize on existing architecture and expand with a simplified offer that saves money.
Modernize at your own pace.
To make the changeover either in one move or step by step, rely on the One Family option offering:

2x CPUs   1x I/O system

Modicon CPU   X80 I/O range   Unity Pro

It is possible to:
■ replace the CPU first and then the I/O,
■ keep S908 cabling and only change the Quantum CPU with a M580.
Later on you can envision a complete switch to the new Ethernet I/O solutions.

Risk and production control

For a limited production stop, the modification of your configuration can be associated with an already planned maintenance operation.

Improved productivity with built-in Ethernet capability allows better operations insight. Predictive and wireless maintenance reduces downtime with redundant controllers and power supply.

Security improvement

For a safe running process, the M580 safety PAC is a safety-related system certified by TÜV Rheinland for use in applications up to SIL3 (safety integrity level 3).

The Modicon M580 Safety improves system reliability thanks to a unique combination between a built-in cybersecurity and safety features.

PAC CyberSecured Certified provides secure safety functionality with little IT knowledge, while incurring no additional costs.

Migration
M580 - Quantum I/O Transition

Rely on a field-proven technology when migrating with M580.
Use Quantum I/O when replacing the processor with an M580: The module CRA31908 + M580 processor replaces the Quantum CPU.

Follow these steps to replace Hardware:
1 Remove Quantum CPUs
2 Replace CPUs with the Quantum S908 Adapter (QSA) modules: 140CRA31908
3 Add the M580 CPUs
4 Connect the CPU and QSA to the EIO ring
5 Remove the outdated Quantum EIO CRP
6 Convert the Quantum Unity application to M580 and transfer. The Unity M580 application converter allows to completely re-importing the whole S908 configuration from Quantum Unity to M580/QSA application.
7 Once the program conversion is completed, replace the Quantum CPU with the new QSA and connect it to the Ethernet I/O loop driven by the M580 CPU
Result: The M580 becomes fully operational in the Quantum 800 series. I/Os are again refreshed over S908.

Integrated converter

Smooth migration is made thanks to a Quantum to M580 conversion tool application.
UMAC (Unity M580 Application Converter) eases the work of converting a Quantum Unity Pro project to M580. It is available in 2 sizes: Lite and Standard. The purpose of UMAC Lite tool is to automatically:
■ Export Quantum hardware configuration and import it into a M580 application including local I/Os, Remote I/Os and Ethernet I/Os,
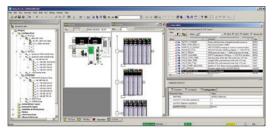■ Export Quantum hardware program (sections) and import it into a M580 application.

Unity M580 Application Converter tool

Modicon Quantum platform modernization
140CRA31908
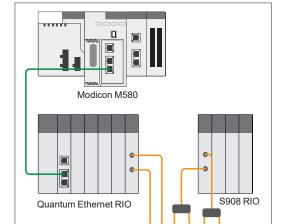### Quantum S908 RIO adapter

S908 bus I/O in Unity Pro with 140CRA31908

Presentation

The Quantum S908 RIO adapter module, **140CRA31908**, is a communication module that can convert the legacy Quantum platform RIO based on the S908 bus network technology into the modern, flexible, Ethernet-embedded M580 platform. Compatible with both standalone and high-availability architectures, and offering a complete set of services and tools for each step, the S908 RIO adapter connects existing Modicon Quantum, SquareD SyMax, and 800 series I/O to the advanced M580 controller as open-ended Ethernet solutions.

The supported architectures are the same as for Quantum:
■ Support of S908 redundant masters (2 x **140CRP93●00** modules acting as the Primary and Standby PLCs)
■ Support of the **140CRA93100** and **140CRA93200** RIO drop adapter modules (dual bus)
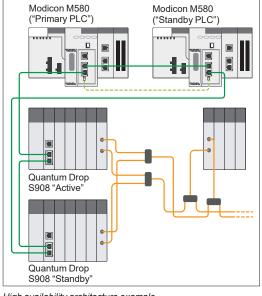■ Support of the same fiber optic topologies

Topologies

Compatible with standalone architecture

Like the Quantum Ethernet drop adapter, **140CRA31200**, the Quantum S908 RIO adapter, **140CRA31908**, supports the same Quantum I/O and catalog as the Quantum Unity system. In addition, use of the **140CRA31908** adapter removes the need for a Quantum processor in the local rack, which is the principle behind the first step of modernizing the Quantum system.

Modernization of an S908-based architecture without rewiring the coaxial bus and I/O cabling involves four simple steps. By removing the Quantum processor from the local rack, and inserting a **140CRA31908** adapter instead, the S908 bus I/O is then ready for connection to the M580 platform. In terms of software conversion, applications can be easily migrated using advanced converter tools.

The Quantum Ethernet scanners (140NOE●●●●●/140NOC●●●●●) are replaced by the embedded scanner services in the M580 processor, or extra BMENOC scanners integrated in the M580 platform.

Standalone architecture example

Compatible with high availability architecture

In high-availability architectures, redundancy is achieved by replacing the 2 Quantum HotStandby processors with 2 Quantum S908 RIO adapters on the local rack, and then connecting the adapters to the M580 high-availability processor.
Similar to the concept of "Primary" and "Standby" PLCs, each CRA will have either the role of Active S908 master or Standby.
The "Active CRA" controls the S908 bus master, and is scanned by M580 processor. S908 outputs can be applied and mapped in the "Primary PLC".
The "Standby CRA" is in listen-only mode on the S908 bus, and is scanned implicitly by the M580 processor, but S908 I/O states are not visible from the application.

The Standby CRA will assume control automatically without any user programming whenever one of the following events appears:
■ CRA no longer seen by CPU (both Ethernet cables broken)
■ Drop power supply error detected
■ CRA31908 hardware error detected
■ CRP hardware error detected
■ S908 bus no longer seen by active CRP (both S908 coaxial cables broken)

The system is independent from the M580 redundancy states.

High availability architecture example

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Modicon Quantum platform modernization
140CRA31908
Quantum S908 RIO adapter

140CRA31908

Description

The Quantum S908 RIO adapter is connected by Ethernet cables equipped with RJ45 connectors.
The dual Ethernet network connection port on the adapter allows daisy chain loop connections using the RSTP protocol (Rapid Spanning Tree Protocol).
The adapter uses one slot in the Quantum rack.

Each adapter module is equipped with:
1 Display block indicating the module status
2 Rotary switches for addressing Ethernet RIO drops (00…159)
3 Dedicated RJ45 SERVICE port for remote service tools such as a PC with Unity Pro, network diagnostics software (ConneXium Network Manager, etc.), or with network analysis tools (port mirroring, etc.), or an HMI terminal, etc.
    This port can also be used to connect Ethernet DIO devices such as Modicon ETB I/O, Altivar variable speed drives, TeSys T motor protection, etc.
4 RJ45 DEVICE NETWORK port for connection to the Ethernet network
5 RJ45 DEVICE NETWORK port for connection to the Ethernet network
6 Removable hinged door

References

Description	Usage	Reference	Weight kg/*lb*
M580 Quantum S908 RIO drop adapter	Allows the M580 system to control the Modicon S908 coaxial bus	**140CRA31908** *(1)*	0.554/ *1.221*

(1) For the "Conformal coating" version, 140CRA31908C, please check on our website www.schneider-electric.com.

Unity M580 Application Converter

Offer Description

Introduction

Unity M580 Application Converter V2 (UMAC V2) is a software tool. Its purpose is to convert Unity Quantum and Unity Premium applications to Unity M580 applications.

UMAC is part of the service offer for PLC modernization.
The PLC modernization offer is comprised of service tools, service products, and service methods to support retrofit and upgrade projects that modernize older Schneider PLCs with new M580 systems.

The main elements of a PLC modernization service offer are as follows:
■ PLC application conversion
■ PLC hardware renewal
■ Quick Wiring offer for the hardware migration (please, consult our Customer Care Center)
■ Methods and procedures for typical configurations

UMAC Lite version is available to all.

UMAC Standard version is available to:
■ End users with services contracts
■ System integrators who are members of the Schneider SI Alliance program
■ Schneider support teams

Value proposition

Estimation phase:
■ The tool provides the means for a rapid assessment and accurate estimation of the application to be converted

Engineering phase:
■ The tool makes a fast and reliable conversion
■ Reduced time to perform the application conversion
■ An accurate conversion – code translation templates and delivered DFB types have been tested in Unity
■ A simple to understand adaptation of the Unity application, preserving its readability
■ A conversion report to keep track of the modifications done on the application

Installation and commissioning phase:
■ Less time required due to a high level of consistency

Benefits in short

In general, the tools help to provide low risk, low cost, efficient, and high quality PLC modernization for our customers.

With the converter, you get:
■ Minimized engineering time on application conversions to Unity M580
■ Less risk of human mistakes: all targeted changes done
■ Better quality, less testing and less commissioning time

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Unity M580 Application Converter tool

Overview of the tool

The tool is helping and automating the upgrade of Unity applications from Premium and Quantum to Unity M580 with the following benefits:

- Shorter programming and testing time
- Reduced cost of application conversion
- Better quality of converted applications
- Faster availability of a fully functional application inside M580.

Premium PL7 and Quantum LL984 or IEC (Modsoft, ProWORX, Concept) applications may also be managed.
The conversion is in 2 steps:

- Use the Unity embedded converters to move Premium PL7 to Premium Unity or Quantum LL984/IEC (Modsoft, ProWORX, Concept) to Quantum Unity
- Use the UMAC tool to move from Premium or Quantum Unity to M580 Unity

Unity M580 Application Converter is a standalone software tool that can be installed on a Windows PC. The complete conversion process relies on the use of Unity Pro.
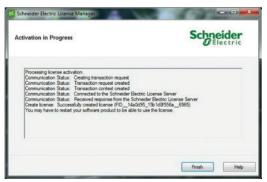
Please note that UMAC V2 is requiring installation of Unity Pro V12 minimum on the same PC.

Versions of Unity M580 Application Converter			
Version	Main capabilities	Registration	Activation
LITE	Retain existing application	Required The Lite tool is available right after Registration of its user	No activation
STANDARD	Retain existing application and adapt the logic to M580	Required The Lite features are available after Registration of the user	Required The Standard tool will be available after Registration of the user and entry of an Activation ID. The Activation is valid for a duration of one year and it is renewable

Features	LITE	STANDARD
Retain Premium I/O	Yes	Yes
Retain Quantum Local I/O	Yes	Yes
Retain Quantum S908 I/O	Yes	Yes
Retain Quantum and X80 Ethernet I/O	Yes	Yes
Retain Logic	Yes	Yes
Identify and locate usage of System Bits and Words	Yes	Yes
Fix missing FFBs	–	Yes
Fix unsupported datatypes	–	Yes
Retain existing Animation tables and User Screens	–	Yes
Fix Alignment Constraints	–	Yes
Fix Alignment in multi-dimension Arrays and Data Structures	–	Yes
Select PUSH/PULL to fix Alignments in Premium	–	Yes
Fix ADDR to ADDM instructions	–	Yes
Adjust Memory Buffer	–	Yes
Translate Ethernet I/O Scanner into DTM	–	Yes
Retain Initial Values	–	Yes

Modicon Quantum platform modernization
Unity M580 Application Converter

License information dialog box

Registration process

Activation process

Overview of the tool (continued)

Tool access and Licensing model

There is only one installation file for both versions Lite and Standard.

Registration: Before using the Lite version, the tool will ask you to enter your email address.
Then the Lite tool will be available with no limitation in time.

Activation: An Activation ID is needed to use the Standard version of the tool.
This activation is time limited with a duration of one year. After one year from its activation the tool will fall back to its first "Lite" state until it receives a new Activation ID for a Standard version.
An Activation ID is valid for one "seat" (Software activated on one PC at a time)

Registration process

A user needs to install and register the software before he can use the Lite tool.
The Installation and Registration process is the following.

Step 1: Obtain the tool
■ An installation file may be downloaded by anyone from
http://www.schneider-electric.com/en/download (Search or browse for UMAC)

Step 2: Install and launch
■ Install the tool and launch it. On this first run, the user will be prompted to fulfil the Registration procedure.

Step 3: Register
■ Fulfil the Registration procedure required in Step 2 to unlock the tool. This procedure will ask the user for his references and an email address. The Lite version of the tool will be unlocked with no limit of duration.

Activation process

The Activation process is related only to the Standard tool. A user needs to activate the software before using the Standard tool. This activation will require to enter an Activation ID.

Go to the "About" window and click on the "Upgrade Product" button.
Proceeding through this step is requesting to have an Activation ID to activate the tool. The tool will be unlocked for a duration of 1 year.

For Alliance System integrators:
The Activation ID is part of the SI Alliance pack

For End users:
The Activation ID can be obtained from the CCC (customer care center) that provides a support contract.

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Modicon Quantum platform modernization
Unity M580 Application Converter

References		
Description	**Reference**	**Weight kg/*lb***
LITE Unity M580 Application Converter	**1MMCNVXZZSPAZZ** *(1)*	–
STANDARD Unity M580 Application Converter	**1MMCSVCZMSXMZZ** *(2)*	–
STANDARD email Unity M580 Application Converter	**1MMCSVCZMSXAZZ** *(3)*	–

(1) The Lite tool is free and downloadable from our website www.schneider-electric.com
(2) This STANDARD tool reference is only available for sales within the Software Alliance Pack.
(3) This STANDARD tool reference is only available for sales within a Service Contract.

A dedicated services offer for your installed base

Schneider Electric, with its experts, products and dedicated tools, provides services such as system design, consultancy, maintenance contracts, modernization of facilities or delivering projects.

The Schneider Electric services offer is structured around several key areas:
- Maintenance and support services:
□ A set of services to help maintain reliability and availability of automated control systems. These services may be the subject of a bespoke maintenance contract to meet your requirements more closely.
- Consultancy services:
□ Diagnostics of the installed base
- Modernization solutions:
□ Migration solutions including consultancy, expertise, tools and technical support to help ensure a smooth transition to newer technology while keeping the wiring and the encoding in most cases.

Customization services are also available to accommodate specific requirements. For more information, please consult the specific pages on our website
www.schneider-electric.com/automationservices

Maintenance and support services	
Spare parts, exchanges and repairs	*Everything you need to get equipment working again as quickly as possible*
	Solutions to respond very quickly to requests for spare parts, exchanges and repairs to your installed automation equipment (automation platforms, Human Machine Interfaces, drives, distributed I/O): ■ Spare parts management: □ Identification of critical parts □ Stock of spare parts: a Schneider Electric owned stock of spare parts, on your site or in one of our warehouses, with immediate availability on site or a contractually agreed delivery time if stored off site □ Testing of spare parts stored on site □ Automatic stock filling ■ Repairs: □ Broken down products are repaired in a network of worldwide repair centres. For each repaired product, our experts provide a detailed report. ■ On-site repair: □ Our experts' knowledge and expertise □ Monitoring of specific repair procedures □ Availability of our teams to respond 24/7 ■ Exchanges: □ With standard replacements, receive a new or reconditioned product before the broken down product has even been sent back □ Fast exchanges offer the option to receive the replacement product within 24 hours (in Europe)
Preventive maintenance	*Improving and guaranteeing the long-term reliability and performance of your installations*
	Schneider Electric's preventive maintenance expert assesses your site, the equipment to be managed and sets up a maintenance program to accommodate specific requirements. A list is provided of the tasks to be performed and their frequency, including site-specific tasks, describing how preventive maintenance is to be managed.
Extended warranty	*An additional manufacturer warranty covering replacement or repair of the equipment*
	The extended warranty offers the option to take out a 3-year warranty. The warranty period can vary according to the geographical area, consult your Customer Care Centre.
Online support	*Access to dedicated experts*
	Priority access to experts who can answer technical questions promptly concerning equipment and software both on sale and no longer commercially available.
Software subscription	*Access to software upgrades and new features*
	By subscribing to software updates, users are able to: ■ Purchase licences ■ Receive updates, upgrades, software migrations and transitions ■ Download software from Schneider Electric's software library

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A dedicated services offer for your installed base

Consultancy services

M2C (Maintenance and Modernization Consultancy) — *Professional tools and methods, proven experience of managing obsolescence and updating installed bases, to reduce downtimes and improve performance*

With our maintenance and modernization consultancy offer, Schneider Electric will help you check the state of your installed base by:
- Defining the scope and depth of the analysis in collaboration with you
- Collecting the technical data without shutting down production
- Analyzing and identifying avenues for improvement
- Producing a recommendation plan

Customer benefits:
- Learning about the components that make up the installed base and how up-to-date they are
- Better downtime anticipation
- Expert advice designed to improve performance

Modernization solutions

Migration to EcoStruxure — *Proven expertise, tools and methods to give you a clear vision of the improvement opportunities and guide you toward a successful modernization project*

Schneider Electric offers gradual solutions of modernization through a set of products, tools and services that allow you to upgrade your installations with our last technologies. Our solutions offer you the choice to plan your modernization:
- Partial modernization: replacement of an old set of components with a new one
- Step by Step modernization: gradual incorporation of new Solutions or Offers in the system
- Complete modernization: total renovation of the system

Eco ☴**truxure**™

To find out more about EcoStruxure architectures, please visit our website www.schneider-electric.com/EcoStruxure

The table below lists our various migration offers:

Wide range of migration offers		Moving to M580/M340/X80 platform						
Solution		Solution Type			Tools	Solution Services		
		Change the CPU and retain the I/O racks & wiring	Change the CPU & the I/O racks & retain I/O field wiring with wiring system	Change the CPU & the I/O racks & the I/O wiring	SoftWare application conversion tool	Modernization / migration service	Manage your project	Execute your project
Platform	Premium	☑	☑	☑	☑	☑	☑	☑
	TSX47 to TSX107		☑	☑	☑	☑	☑	☑
	Quantum	☑		☑	☑	☑	☑	☑
	Modicon 984 & 800 Series I/O	☑	☑	☑	☑	☑	☑	☑
	Modicon Compact		☑	☑	☑	☑	☑	☑
	Symax	☑	(1)	☑	☑	☑	☑	☑
	April series 1000		(2)	☑	☑	☑	☑	☑
	April SMC			☑	☑	☑	☑	☑
	Merlin Gerin PB			☑		☑	☑	☑
	AEG		(1)	☑		☑	☑	☑
	Rockwell SLC500		☑	☑	☑	☑	☑	☑
	Rockwell PLC 5	☑	(1)	☑	☑	☑	☑	☑

☑	Service available

(1) Consult Schneider services - project specific solution is possible
(2) For April series 1000 (April 5000-7000 also the April 2000-3000)
*   Consult Schneider services - project specific solution is possible*

Customization services

Schneider Electric is able to meet your specific requirements and provide you with adapted products:
- Protective coating for Human Machine Interfaces, automation platforms and distributed I/O modules for use in harsh environments
- Customized cable lengths to match your specific needs
- Customized front panels for Human Machine Interfaces

Note: To check availability of services required, please contact our Customer Care Centre.

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PlantStruxure

Schneider Electric Industries SAS

Head Office
35, rue Joseph Monier
F-92500 Rueil-Malmaison
France

Design: Schneider Electric
Photos: Schneider Electric

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