

Modicon M580

Update Procedure

User Guide

Original instructions

10/2019

EIO0000002383.02

www.schneider-electric.com



The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

You agree not to reproduce, other than for your own personal, noncommercial use, all or part of this document on any medium whatsoever without permission of Schneider Electric, given in writing. You also agree not to establish any hypertext links to this document or its content. Schneider Electric does not grant any right or license for the personal and noncommercial use of the document or its content, except for a non-exclusive license to consult it on an "as is" basis, at your own risk. All other rights are reserved.

All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

© 2019 Schneider Electric. All rights reserved.

Table of Contents



	Safety Information	5
	About the Book	9
Part I	Update Procedure	11
Chapter 1	Modicon M580 CPU Update Procedure	13
	Firmware Update	14
	LED Diagnostics for M580 CPU	16
Chapter 2	Ethernet Communications Module Update Procedure ..	17
	Firmware Update	17
Chapter 3	BMECXM0100 Module Update Procedure	19
	Firmware Update	20
	LED Diagnostic	21
Chapter 4	Ethernet RIO Adapter Firmware Update	27
	EIO Adapter Firmware Update	28
	LED Indicators on Ethernet RIO Adapter Modules	32
Chapter 5	Hot Standby Elements Firmware Update	33
	Firmware Update	33
Chapter 6	BMEXBPxxxx Rack Firmware Update	37
	Rack Firmware Update	37
Chapter 7	General FAQ Including Update Topic	39
	Frequently Asked Questions (FAQ)	39
Glossary	45
Index	49

Safety Information



Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

BEFORE YOU BEGIN

Do not use this product on machinery lacking effective point-of-operation guarding. Lack of effective point-of-operation guarding on a machine can result in serious injury to the operator of that machine.

 WARNING
UNGUARDED EQUIPMENT
<ul style="list-style-type: none">• Do not use this software and related automation equipment on equipment which does not have point-of-operation protection.• Do not reach into machinery during operation.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

This automation equipment and related software is used to control a variety of industrial processes. The type or model of automation equipment suitable for each application will vary depending on factors such as the control function required, degree of protection required, production methods, unusual conditions, government regulations, etc. In some applications, more than one processor may be required, as when backup redundancy is needed.

Only you, the user, machine builder or system integrator can be aware of all the conditions and factors present during setup, operation, and maintenance of the machine and, therefore, can determine the automation equipment and the related safeties and interlocks which can be properly used. When selecting automation and control equipment and related software for a particular application, you should refer to the applicable local and national standards and regulations. The National Safety Council's Accident Prevention Manual (nationally recognized in the United States of America) also provides much useful information.

In some applications, such as packaging machinery, additional operator protection such as point-of-operation guarding must be provided. This is necessary if the operator's hands and other parts of the body are free to enter the pinch points or other hazardous areas and serious injury can occur. Software products alone cannot protect an operator from injury. For this reason the software cannot be substituted for or take the place of point-of-operation protection.

Ensure that appropriate safeties and mechanical/electrical interlocks related to point-of-operation protection have been installed and are operational before placing the equipment into service. All interlocks and safeties related to point-of-operation protection must be coordinated with the related automation equipment and software programming.

NOTE: Coordination of safeties and mechanical/electrical interlocks for point-of-operation protection is outside the scope of the Function Block Library, System User Guide, or other implementation referenced in this documentation.

START-UP AND TEST

Before using electrical control and automation equipment for regular operation after installation, the system should be given a start-up test by qualified personnel to verify correct operation of the equipment. It is important that arrangements for such a check be made and that enough time is allowed to perform complete and satisfactory testing.

WARNING

EQUIPMENT OPERATION HAZARD

- Verify that all installation and set up procedures have been completed.
- Before operational tests are performed, remove all blocks or other temporary holding means used for shipment from all component devices.
- Remove tools, meters, and debris from equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Follow all start-up tests recommended in the equipment documentation. Store all equipment documentation for future references.

Software testing must be done in both simulated and real environments.

Verify that the completed system is free from all short circuits and temporary grounds that are not installed according to local regulations (according to the National Electrical Code in the U.S.A, for instance). If high-potential voltage testing is necessary, follow recommendations in equipment documentation to prevent accidental equipment damage.

Before energizing equipment:

- Remove tools, meters, and debris from equipment.
- Close the equipment enclosure door.
- Remove all temporary grounds from incoming power lines.
- Perform all start-up tests recommended by the manufacturer.

OPERATION AND ADJUSTMENTS

The following precautions are from the NEMA Standards Publication ICS 7.1-1995 (English version prevails):

- Regardless of the care exercised in the design and manufacture of equipment or in the selection and ratings of components, there are hazards that can be encountered if such equipment is improperly operated.
- It is sometimes possible to misadjust the equipment and thus produce unsatisfactory or unsafe operation. Always use the manufacturer's instructions as a guide for functional adjustments. Personnel who have access to these adjustments should be familiar with the equipment manufacturer's instructions and the machinery used with the electrical equipment.
- Only those operational adjustments actually required by the operator should be accessible to the operator. Access to other controls should be restricted to prevent unauthorized changes in operating characteristics.

About the Book



At a Glance

Document Scope

This user guide explains how to update Modicon M580 and eX80 modules firmware.

NOTE: This user guide is a collection of the information available across Control Expert help.

Update Procedure

The update procedure is a maintenance operation that consists in changing a CPU or module embedded software. It requires the CPU to be in `STOP` mode and disconnected from the systems and applications it effects. When a module is addressed through the CPU, the CPU must be in `STOP` mode and no functional communication traffic occur between the CPU and the module.

NOTICE

INOPERABLE EQUIPMENT

Stop the CPU before any firmware update or firmware check with Unity Loader software.

Failure to follow these instructions can result in equipment damage.

Validity Note

This document is valid for EcoStruxure™ Control Expert 14.1 or later.


Related Documents

Title of documentation	Reference number
Modicon M580, Hardware, Reference Manual	EIO0000001578 (English), EIO0000001579 (French), EIO0000001580 (German), EIO0000001582 (Italian), EIO0000001581 (Spanish), EIO0000001583 (Chinese)
Modicon M580, RIO Modules, Installation and Configuration Guide	EIO0000001584 (English), EIO0000001585 (French), EIO0000001586 (German), EIO0000001587 (Italian), EIO0000001588 (Spanish), EIO0000001589 (Chinese),

Title of documentation	Reference number
Modicon M580 BMENOC0301/11, Ethernet Communication Module, Installation and Configuration Guide	HRB62665 (English), HRB65311 (French), HRB65313 (German), HRB65314 (Italian), HRB65315 (Spanish), HRB65316 (Chinese)
Modicon M580, BMECXM CANopen Modules, User Manual	EIO0000002129 (English), EIO0000002130 (French), EIO0000002131 (German), EIO0000002132 (Italian), EIO0000002133 (Spanish), EIO0000002134 (Chinese)
Modicon M580 Standalone, System Planning Guide for Frequently Used Architectures	HRB62666 (English), HRB65318 (French), HRB65319 (German), HRB65320 (Italian), HRB65321 (Spanish), HRB65322 (Chinese)
Modicon M580 Hot Standby, System Planning Guide for Frequently Used Architectures	NHA58880 (English), NHA58881 (French), NHA58882 (German), NHA58883 (Italian), NHA58884 (Spanish), NHA58885 (Chinese)

You can download these technical publications and other technical information from our website at www.schneider-electric.com/en/download.

Product Related Information

 WARNING
<p>UNINTENDED EQUIPMENT OPERATION</p>
<p>The application of this product requires expertise in the design and programming of control systems. Only persons with such expertise should be allowed to program, install, alter, and apply this product.</p>
<p>Follow all local and national safety codes and standards.</p>
<p>Failure to follow these instructions can result in death, serious injury, or equipment damage.</p>

Part I

Update Procedure

Introduction

Each of the following chapters describes the update procedure for CPU, modules, switches, and racks in a Modicon M580 PAC.

To proceed with a firmware or OS update, you need the following elements:

- Unity Pro software version 8.0 or later installed on the PC.
 - NOTE:** Unity Pro is the former name of Control Expert for version 13.1 or earlier.
 - It is not necessary to launch Unity Pro/Control Expert for a firmware or OS update.
- The new firmware or operating system file. It can be downloaded from <http://www.schneider-electric.com>.
- Unity Loader software. It is available for download on <http://www.schneider-electric.com/ww/en/download> and has to be installed on the PC.

The following standalone modules can be updated:

- BMEP58•••• CPU
- Ethernet communications module:
 - BMENOC0301/11
- CANopen communications module:
 - BMECXM0100
- Ethernet RIO adapter:
 - BMECRA312•0
 - BMXCRA312•0

The following Hot Standby modules can be updated:

- BMEH58•040 CPU
- Ethernet communications module:
 - BMENOC0301/11
- Ethernet RIO adapter:
 - BMECRA312•0
 - BMXCRA312•0
- Ethernet network option switch modules.

The following racks can be updated:

- BMEXBP•••• Ethernet rack

What Is in This Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
1	Modicon M580 CPU Update Procedure	13
2	Ethernet Communications Module Update Procedure	17
3	BMECXM0100 Module Update Procedure	19
4	Ethernet RIO Adapter Firmware Update	27
5	Hot Standby Elements Firmware Update	33
6	BMEXBPxxxx Rack Firmware Update	37
7	General FAQ Including Update Topic	39

Chapter 1

Modicon M580 CPU Update Procedure

Overview

The following chapter presents the CPU update procedure.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Firmware Update	14
LED Diagnostics for M580 CPU	16

Firmware Update

Introduction

You can update the CPU firmware by downloading a new firmware version with Unity Loader.

Download the firmware through a connection to one of these:

- CPU mini-B USB connector (*see Modicon M580, Hardware, Reference Manual*)
- CPU **Service** port (*see Modicon M580, Hardware, Reference Manual*)
- Ethernet network

NOTE:

- For a description of the download procedure, refer to the *Unity Loader, User Manual*.
- When using an M580 Hot Standby configuration, refer to the *Modicon M580 Hot Standby System Planning Guide for Frequently Used Architectures*.

Enabling CPU Firmware Update

To enable the firmware update, check the CPU security settings (*see Modicon M580, Hardware, Reference Manual*).

Firmware File

Select the firmware file (*.ldx) that is compatible with your CPU.

Update Procedure

Interrupting the update procedure before it has completed can cause irreparable damage to the CPU.

NOTICE

EQUIPMENT DAMAGE

During the transfer of the firmware file:

- Do not power OFF the CPU.
- Do not power OFF the PC.
- Do not shut down Unity Loader.
- Do not disconnect the communication cable.
- Do not remove or insert the optional SD memory card.

Failure to follow these instructions can result in equipment damage.

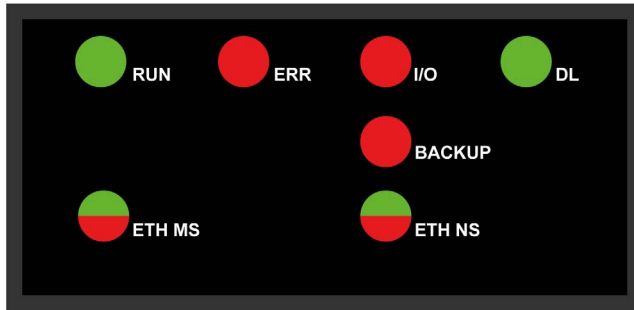
Update the CPU and BMEXBP••00 rack firmware:

Step	Action
1	Install Unity Loader software.
2	Connect the PC that is running Unity Loader to the CPU.
3	Launch Unity Loader.
4	Click Firmware tab.
5	In the PC list box, select the <i>.idx</i> file that contains the firmware file.
6	When connected with Ethernet, check that the MAC address indicated in the PLC box corresponds to the MAC address marked on the CPU.
7	Check that transfer sign is green to allow transfer from PC to CPU.
8	Click Transfer .
9	Click Close .

LED Diagnostics for M580 CPU

LED Display

The LED display is located on the front panel of the CPU:



LED Indication Related to Firmware Update

LED Indicator	Description
DL (<i>download</i>)	<ul style="list-style-type: none"> ● Blinking: Firmware update in progress. ● OFF: No firmware update in progress.

Chapter 2

Ethernet Communications Module Update Procedure

Firmware Update

Introduction

You can update the firmware on the Ethernet communications module by downloading a new firmware version with Unity Loader.

The firmware download can be performed by connecting to the Ethernet network through ETH 1.

Refer to *Unity Loader, User Manual* for a description of the download procedure.

Enabling the Update

To enable the firmware update, check the security settings (*see Modicon M580, BMENOC0301/0311 Ethernet Communications Module, Installation and Configuration Guide*).

Firmware File

The firmware file is a *.*ldx* file.

Procedure

Update the firmware for the Ethernet communications module and the BMEXBP••00 rack:

Step	Action
1	Install Unity Loader software.
2	Connect the PC that is running Unity Loader to the Ethernet communications module.
3	Launch Unity Loader.
4	Click Firmware tab.
5	In the PC list box, select the <i>.ldx</i> file that contains the firmware file.
6	When connected with Ethernet, check that the MAC address indicated in the PLC box corresponds to the MAC address marked on the connected device (PLC or Ethernet communication module).
7	Check that transfer sign is green to allow transfer from PC to connected device.
8	Click Transfer .
9	Click Close .

Chapter 3

BMECXM0100 Module Update Procedure

Overview

The following chapter presents the BMECXM0100 update procedure and the LED status (among which appears the firmware update in progress status).

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Firmware Update	20
LED Diagnostic	21

Firmware Update

Overview

You can update the firmware for the BMECXM module by downloading a new firmware version with Unity Loader. The minimum version for Unity Loader is V11.0.

The firmware download can be performed by connecting to the Ethernet network.

Refer to the *Unity Loader, User Manual* for a description of the download procedure.

Password

A firmware password is set in Control Expert and sent to each BMECXM module firmware. To access the Control Expert password in the **Project Browser**, right-click **Project** → **Properties of Project** → **Protection**.

To perform the update, check that the password set in Unity Loader matches the password set in Control Expert.

Preparation

Before performing the firmware update:

- Check that the FTP service (*see Modicon M580, BMECXM CANopen Modules, User Manual*) is enabled.
- Stop the PLC.
- Open Unity Loader on your PC. (**Start** → **Programs** → **Schneider Electric** → **Unity Loader**).

 WARNING
UNKNOWN OPERATIONAL STATE OF EQUIPMENT
Evaluate operational state of equipment before stopping the PLC.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: If you do not stop the PLC before trying to transfer firmware, you are informed by Unity Loader that the PLC must be stopped. After confirming this message, Unity Loader stops the PLC automatically.

LED Diagnostic

Overview

LED indicators report the behavior of the module and its communications with the network. LED indicators appear as words or abbreviations at the top of the module.

LED Display

This is the LED display located on the front panel of the BMECXM module:



Each LED of the BMECXM module is located with a corresponding positioning letter used in the input parameter `CXM_DISPLAY` of the module device DDT (see *Modicon M580, BMECXM CANopen Modules, User Manual*):

A = RUN	B = ERR	C = I/O	D = BS
E = CAN RUN	–	G = CAN ERR	–
F = CAN COM	–	–	–

LED State and Flash Rates

This table describes the LED state used in the following tables for diagnosing the module:

LED State	Flash Rate	State Symbol
LED off	Constantly OFF	
LED on	Constantly ON	
LED blinking	Iso-phase: <ul style="list-style-type: none"> ● 200 ms ON ● 200 ms OFF 	
LED flashing	One short single flash: <ul style="list-style-type: none"> ● 200 ms ON ● 1200 ms OFF 	
One of the possible patterns	–	

LED Description

This table describes the **RUN**, **ERR**, **I/O**, and **BS** LED states and colors of the BMECXM module:





















LED	Color	State	Description
RUN	Green	On	The module is in RUN state.
		Off	<ul style="list-style-type: none"> There is no power to the module, or Module configuration failed (see ERR LED for identifying the detected error).
		Blinking	<ul style="list-style-type: none"> The power on self-test is running, or A firmware update is in progress (see BS LED to confirm).
ERR	Red	On	<ul style="list-style-type: none"> Critical error detected while running the power-on self-test (INITIALIZATION phase failed), or Error detected while getting IP address via DHCP (duplicate address).
		Off	No errors detected.
		Blinking	<ul style="list-style-type: none"> The power on self-test is running, or An error detected while retrieving the FDR file.
I/O	Red	Off	Signification is depending on the module status: <ul style="list-style-type: none"> If the module is in not in RUN state: <ul style="list-style-type: none"> A firmware update is in progress (see BS LED to confirm). Module configuration failed (see ERR LED for identifying the detected error). If the module is in RUN state, the combination of I/O and CAN ERR LEDs provides a CANopen diagnostic (<i>see page 24</i>).
		On	The CANopen fieldbus state is NO-CONF or BUS OFF .
		Blinking	Signification is depending on the module status: <ul style="list-style-type: none"> If the module is in not in RUN state, the power-on self-test is running. If the module is in RUN state, the combination of I/O and CAN ERR LEDs provides a CANopen diagnostic (<i>see page 24</i>).
BS (bus status)	–	Off	<ul style="list-style-type: none"> Module is not configured, or Module is waiting for IP address from DHCP.
		Green	On
	Green	Flashing	The module has an IP address, but there is no EtherNet/IP connection.
		Blinking	The power on self-test is in progress.
		Red	On
	Red	Flashing	At least one EtherNet/IP connection is lost. The LED flashes until the connection is re-established or the module is reset.
		Yellow	Blinking

This table describes the **CAN RUN**, **CAN ERR**, and **CAN COM** LED states and colors of the CANopen fieldbus:

LED	Color	State	Description
CAN RUN	Green	Off	There is no power to the module.
		On	The CANopen fieldbus state is OPERATIONAL .
		Blinking	The CANopen fieldbus state is PRE-OPERATIONAL .
		Flashing	The CANopen fieldbus state is STOPPED .
CAN ERR	Red	On	<ul style="list-style-type: none"> No CANopen device is configured, or CANopen fieldbus state is BUS OFF
		Off	No CANopen error detected.
		Flashing	At least one of the detected error counters has reached or exceeded the warning level (too many error frames).
CAN COM	Yellow	Flashing	There is an SDO message.

General Diagnostic

A general diagnostic of the module is possible when you observe the four upper LEDs (**RUN**, **ERR**, **I/O**, and **BS**) in combination:

LEDs					Condition			
	RUN		ERR		I/O		BS	Firmware download.
	RUN		ERR		I/O		BS	Power is off. CXM_OP_STATE=IDLE
	RUN		ERR		I/O		BS	Power-on self-test is in progress. CXM_OP_STATE=INITIALIZATION
	RUN		ERR		I/O		BS	The power on self-test failed. CXM_OP_STATE=INITIALIZATION
	RUN		ERR		I/O		BS	The power on self-test is completed and the module proceed to: <ul style="list-style-type: none"> Backplane initialization, Get IP address (from DHCP), Get configuration file (from FDR server). CXM_OP_STATE=UNCONFIGURED
<p>(1) The status of the I/O LED in combination with CAN ERR LED gives information on I/O exchange with CANopen devices (<i>see page 24</i>).</p> <p>(2) In case of duplicate IP address, the LED BS is blinking at the start-up phase then the module restarts.</p>								








LEDs				Condition
RUN	ERR	I/O	BS	Error detected while getting IP address via DHCP (duplicate address ⁽²⁾). CXM_OP_STATE=UNCONFIGURED
RUN	ERR	I/O	BS	Valid IP address but no EtherNet/IP connection. CXM_OP_STATE=CONFIGURED
RUN	ERR	I/O ⁽¹⁾	BS	EtherNet/IP connections established. CXM_OP_STATE=CONNECTED STOP, CONNECTED RUN, or FALLBACK
RUN	ERR	I/O ⁽¹⁾	BS	EtherNet/IP connections are closed. CXM_OP_STATE=CONNECTED STOP, CONNECTED RUN, or FALLBACK
RUN	ERR	I/O ⁽¹⁾	BS	Detected communication failure. CXM_OP_STATE=CONNECTED STOP, CONNECTED RUN, or FALLBACK
<p>(1) The status of the I/O LED in combination with CAN ERR LED gives information on I/O exchange with CANopen devices (see page 24).</p> <p>(2) In case of duplicate IP address, the LED BS is blinking at the start-up phase then the module restarts.</p>				








CANopen LED Diagnostic

The module in RUN state is a prerequisite to diagnose the I/O exchange with CANopen devices with the LEDs.

The following tables give diagnostic when you observe the I/O and CAN ERR LEDs in combination:

LEDs				Condition
RUN	ERR	I/O	BS	No device configured, or CANopen bus is off (physical wire is bus off).
CAN RUN		CAN ERR		
CAN COM				

LEDs				Condition
 RUN	 ERR	 I/O	 BS	Configuration detected error, communication detected error on CANopen device or CANopen device absent on bus.
 CAN RUN		 CAN ERR		
 CAN COM				

LEDs				Condition
 RUN	 ERR	 I/O	 BS	No error detected.
 CAN RUN		 CAN ERR		
 CAN COM				

Chapter 4

Ethernet RIO Adapter Firmware Update

Overview

The following chapter presents the Ethernet RIO adapter update procedure.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
EIO Adapter Firmware Update	28
LED Indicators on Ethernet RIO Adapter Modules	32

EIO Adapter Firmware Update

Overview

Use these procedures to update the firmware for the EIO adapter:

Stage	Description
1	Download and install Unity Loader software.
2	Configure and store IP parameters (optional).
3	Connect your configuration PC to the EIO adapter.
4	Transfer the firmware update to the EIO adapter or the Ethernet backplane.

The minimum required version of Unity Loader is V8.0.

These instructions apply to the BMXCRA31200, BMXCRA31210, BMECRA31210, and 140CRA31908 modules.

Downloading and Installing Unity Loader

Download the Unity Loader software to your PC:

Step	Action
1	Enter the web address for Schneider Electric (www.schneider-electric.com) in an Internet browser.
2	In the Search from input field , enter the phrase Unity Loader and press <code>Enter</code> .
3	Examine the search results and select the appropriate entry for the Unity Loader software.
4	Follow the on-screen instructions to download both the Unity Loader installation software and any necessary installation instructions.
5	Run the Unity Loader setup file and follow the instructions (on the screen and in the downloaded documentation) to install Unity Loader.

Default Address Configurations

If the CRA IP address is not configured, you can temporarily use its default IP address by setting the rotary switch to **Stored**. This default IP address is overwritten when you configure and store valid IP parameters.

The adapter uses these default address configurations:

Parameter	Description
Default IP Address	The default IP address starts with 10.10 and uses the last 2 bytes of the MAC address. As an example, a device with the MAC address of 00:00:54:10:8A:05 has a default IP address of 10.10.138.5 (0x8A=138, 0x05=5).
Default Sub-Network Mask	The default mask is 255.0.0.0 (a class A mask).
Default Gateway Address	The default gateway address is identical to the default IP address.

The default address is based on the adapter MAC address. This makes it possible for several Schneider Electric devices to use their default network configurations on the same network.

To configure and store IP parameters that are not the default values for the remote drop adapter:

Step	Action
1	Start or re-start the adapter with the rotary switch set to Stored .
2	Store the IP address by sending an explicit message to the TCP/IP Interface Object (see <i>Modicon M580, RIO Modules, Installation and Configuration Guide</i>) (Attribute ID 05: Interface Configuration).

NOTE: The adapter uses the stored IP parameters only after a power cycle.

Connect the Configuration PC to the EIO Adapter

Connect your configuration PC (that is running Unity Loader) directly to the adapter module via an Ethernet port.

Verify that communications are established between the PC and the adapter by issuing a ping command from the PC:

Step	Action	Comment
1	Open a command window on the PC.	Start → Run.
2	In the Run dialog, type in cmd .	
3	Click OK .	
4	At the command prompt, type in the ping command and the device IP address.	Example: C:\>ping 192.168.21.38:
5	The command window verifies that a connection is established.	Example: Reply from 192.168.21.38...

Update Procedure

Do not interrupt the firmware download process by:

- allowing an interruption to the power or communications
- closing the Unity Loader software

If the firmware download process is interrupted, the new firmware is not installed and the adapter continues to use the old firmware. If an interruption occurs, restart the process.

NOTE: If the download is not completed, there is a message saying that the update was unsuccessful.

To update the firmware for the EIO adapter:

Step	Action
1	Open Unity Loader on your PC. (Start → Programs → Schneider Electric → Unity Loader) Result: Unity Loader opens and displays the Project tab.
2	At the bottom of the tab in the Connection area, connect to the module: <ul style="list-style-type: none"> • In the Media list, select Ethernet. • In the Address field, type in the IP address of the adapter, which is either: <ul style="list-style-type: none"> ○ <i>configured</i>: The adapter is already communicating on the network and the IP address for the module is configured in the application in the BME•58••40 CPU module. ○ <i>default</i>: The adapter rotary switch position is Stored and you did not already store valid IP parameters. • Click Connect.
3	After Unity Loader has connected to the module, click the Firmware tab in the Unity Loader dialog.
4	In the PC area, click the ellipsis (...) button to open a dialog where you can navigate to and select the firmware file for the adapter module. The firmware is contained in a Unity Loader file (.LDX extension). NOTE: When using the BMECRA31210, you can also update firmware for a BMEXBP••00. After you select the firmware file and close the dialog, the selected revision of this firmware is displayed in the list on the left, and the current version of the firmware is displayed in the list on the right.
5	When the arrow in the middle of the Unity Loader dialog is green, click Transfer . NOTE: Only click Transfer if the arrow is green. A yellow arrow indicates that the firmware file on your computer is the same version or newer than the file selected for transfer; a red arrow indicates that the firmware on the computer is not compatible with the EIO adapter.
6	Click Yes on the 2 dialogs that appear.
7	The Transferring data to PLC opens, which indicates the transfer status with the blue bars at the bottom of the screen.
8	After the transfer is complete, click Close .
9	In the Unity Loader software, click Disconnect and close the window.
10	Reboot the module to finalize the firmware update.

From 1 instance of Unity Loader, you can only update 1 device. To update several devices at the same time, open additional instances of Unity Loader. In this case, additional dialogs. Click **Yes** to close each dialog.

The update process takes approximately 3 minutes:

- firmware update (approximately 2 minutes)
- reboot, reestablish I/O connections (1 minute)

During the firmware update, the I/O communication with the adapter module is interrupted. After the hold up time (*see Modicon M580, RIO Modules, Installation and Configuration Guide*) expires, the output modules move to the pre-configured fallback setting (a value of 0, 1, or hold last value).

LED Indicators on Ethernet RIO Adapter Modules

Display

The LEDs are on the front of the Ethernet RIO adapter module:



LED Indication During Firmware Update

Condition	Run	I/O	MS (Module Status)		NS (Network Status)	
	Green	Red	Green	Red	Green	Red
During OS firmware update	Flashing	Off	Off	On	Off	On

Chapter 5

Hot Standby Elements Firmware Update

Firmware Update

Introduction

You can update firmware for modules in an M580 Hot Standby system by installing a new firmware version using Unity Loader.

The firmware installation can be performed for the following modules:

- Hot Standby CPUs
- (e)X80 EIO adapter modules
- Ethernet communication modules
- Ethernet network option switch modules

NOTE: In a Hot Standby system, Schneider Electric recommends that you update the firmware in system communication modules (for example, BMENOC0301/11) before updating the firmware in the CPUs.

Refer to the *Unity Loader, User Manual* for a description of the download procedure.

Firmware File

The firmware file is a **.dx* file.

Updating CPU Firmware Without Stopping the Hot Standby System Process

You can update firmware in the two Hot Standby CPUs without interrupting the system process if the following pre-conditions exist:

- One CPU is running as the primary.
- The other CPU is running as the standby.
- The **FTP** setting is enabled in the **Security** tab of the **EIO** network.
- Logic mismatch is allowed for the Hot Standby system, by setting the `LOGIC_MISMATCH_ALLOWED` (see *Modicon M580 Hot Standby, System Planning Guide for, Frequently Used Architectures*) property.
- Firmware mismatch is allowed for the Hot Standby system, by setting the `FW_MISMATCH_ALLOWED` (see *Modicon M580 Hot Standby, System Planning Guide for, Frequently Used Architectures*) property
- The new firmware to be installed is not fundamentally different from the old firmware, and therefore will not trigger an `APP_MISMATCH` (see *Modicon M580 Hot Standby, System Planning Guide for, Frequently Used Architectures*) condition.

When updating the CPU firmware, install the standby CPU firmware first, then install the primary CPU firmware.

Interrupting the update procedure before it has completed can cause irreparable damage to the CPU.

NOTICE

EQUIPMENT DAMAGE

During the transfer of the firmware file:

- Do not power OFF the CPU.
- Do not power OFF the PC.
- Do not shut down Unity Loader.
- Do not disconnect the communication cable.
- Do not remove or insert the optional SD memory card.

Failure to follow these instructions can result in equipment damage.

To update Hot Standby CPU module firmware, follow these steps:

Step	Action
1	Install on your PC the Unity Loader software.
2	Connect the PC that is running Unity Loader to one of the following ports on the standby CPU module: <ul style="list-style-type: none"> ● the CPU mini-B USB port, or ● the CPU Ethernet service port
3	Launch Unity Loader.
4	Click Firmware tab.
5	In the PC list box, select the <i>.idx</i> file that contains the firmware file.
6	Check that transfer sign is green to allow transfer from PC to the module.
7	Click Transfer .
8	After the transfer of firmware is complete, click Close . NOTE: Upon completion of the firmware update, the standby CPU remains the standby CPU.
9	Confirm that the installation of firmware did not create an application mismatch condition.
10	Repeat steps 2 through 8, above, for the primary CPU. NOTE: <ul style="list-style-type: none"> ● When you begin the transfer, the standby CPU immediately becomes the primary. ● The primary CPU becomes the standby upon completion of the firmware update.

Updating Other Firmware

You can update firmware to other modules in the Hot Standby network, without interrupting the system process. This is accomplished by connecting your PC (running Unity Loader) directly to the Ethernet service port of the (e)X80 EIO adapter module, Ethernet communication module, or Ethernet network option switch module.

NOTE: If you instead connect your PC (running Unity Loader) to the CPU to perform this update, the process executing in the CPU stops until the update is complete.

Follow these steps to update the firmware to other modules in the Hot Standby system:

Step	Action
1	Install Unity Loader software.
2	Connect the PC that is running Unity Loader to the service port of the target module, which can be: <ul style="list-style-type: none"> ● a (e)X80 EIO adapter module ● an Ethernet communications module ● an Ethernet network option switch module
3	Launch Unity Loader.
4	Click Firmware tab.
5	In the PC list box, select the <i>.dx</i> file that contains the firmware file.
6	Check that transfer sign is green to allow transfer from PC to the module.
7	Click Transfer .
8	Click Close .

Chapter 6

BMEXBPxxxx Rack Firmware Update

Rack Firmware Update

Introduction

You can update the firmware of the Ethernet racks (BMEXBP**00 and BMEXBP**02) by downloading a new firmware version with Unity Loader.

Download the firmware by connecting to any of these modules installed on the rack:

- M580 CPU
- BMECRA312•0 (e)X80 adapter module

Preparation

Before performing the update:

- check that the service (**FTP Service** or **Service Port**) is enabled.
- stop the PLC.
- open Unity Loader on your PC (**Start** → **Programs** → **Schneider Electric** → **Unity Loader**).

 WARNING
UNKNOWN OPERATIONAL STATE OF EQUIPMENT
Evaluate operational state of equipment before stopping the PLC.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: If you do not stop the PLC before trying to transfer firmware, you are informed by Unity Loader that the PLC must be stopped. After confirming this message, Unity Loader stops the PLC automatically.

Firmware

The firmware file is included in an **.dx* file.

Troubleshooting

If the rack power supply is turned off during the update procedure, the backplane firmware remains on the version embedded before the update procedure.

Chapter 7

General FAQ Including Update Topic

Frequently Asked Questions (FAQ)

Connection

Why can't I connect the CPU in Control Expert?

Possible cause:

A BME XBE 1000 rack extender module may be installed on the main local rack without the presence of an extended local rack.

Possible solution:

Remove the BME XBE 1000 module from the main local rack, or add an extended local rack.

Why can't I connect to the CPU with Unity Loader?

Possible cause:

By default, the FTP service in the CPU is disabled (cyber security (*see Modicon Controllers Platform, Cyber Security, Reference Manual*) default setting). Unity Loader does not connect to the CPU if this service is disabled.

Possible solution:

Enable the FTP service in the CPU by downloading an application, in which the FTP service is enabled, to the CPU.

How can I update a BM• CRA 312 •0 (e)X80 EIO adapter module that is not yet configured?

The BM• CRA 312 •0 module receives its IP address from the CPU at startup. If the CPU is not configured or the firmware version of the BM• CRA 312 •0 module is not compatible, the BM• CRA 312 •0 module does not receive an IP address.

Set the rotary switches on the BM• CRA 312 •0 module to **stored**. Power cycle the BM• CRA 312 •0 module. Connect the BM• CRA 312 •0 module via its service port to Unity Loader using the IP address: 10.10.mac5.mac6.

ConneXium Network Manager

Why can't I discover IMPRs? I installed the ConneXium Network Manager tool, but the IMPRs are shown as Modbus devices.

Possible cause:

- You may not have the latest version of ConneXium Network Manager.
- You may not have specified the `GET` community name while discovering the network.

Possible solution:

- Install the latest version of ConneXium Network Manager or contact Schneider Electric support to get the Ethernet IMPR device types.
- Add the `GET` community name of the IMPR before discovering the network. You can retrieve the `GET` community name by reading the configuration using PowerSuite. By default, the IMPR `GET` community name is `public_1`.

Why is ConneXium Network Manager taking such a long time to discover the network?

Possible cause:

- The parameters you selected before discovering the network may be slowing down the process.

Possible solution:

- You can speed up the network discovery by adjusting the tool discovery parameters. Please read the *ConneXium Network Manager Ethernet Diagnostic Tool Reference Guide*.
NOTE: If you increase the network discovery speed, you will also increase network traffic.

Why does ConneXium Network Manager display the IMPRs in a star topology when I have the IMPRs connected in a daisy chain or daisy chain loop topology?

Possible cause:

- ConneXium Network Manager does not currently support daisy chain and daisy chain loop topologies. Please contact ConneXium Network Manager support to find out when these topologies will be supported.

Possible solution:

- Manually edit the network topology that ConneXium Network Manager displays to create your own topology.

Why does ConneXium Network Manager say that my IP address has an invalid gateway?

Possible cause:

When you enter a gateway address, ConneXium Network Manager does 2 things:

- validates that the gateway address is in the same subnet as the IP address
- contacts the gateway address
 - If a response is received from the gateway address, ConneXium Network Manager discovers if the address is actually a gateway/router address. If the address is not an actual gateway/router address, ConneXium Network Manager displays a detected error message.
 - If no response is received from the gateway address, ConneXium Network Manager takes no action.

Possible solution:

- Enter a valid gateway address.
 - or –
- Enter a gateway address that is in the same subnet as the IP address. Check that the gateway address is not assigned to any other device on the subnet.

CPU

How do I proceed when a CPU, whose ERR, I/O, and BACKUP LED indicators are red, has stopped communicating?

The configuration memory in the CPU may be corrupted, which is detected during self-tests, and may not allow the CPU to boot. Move the CPU to another rack slot and power cycle. The CPU will then start in *no conf* state.

How do I set my CPU to a *no conf* state?

Use the *backup clear* feature in Control Expert, and power cycle the CPU.

Ethernet Ports / Cables / Networks (Loops)

Why is my Ethernet device (HART module, weighing module, or distributed device) unable to accept its configuration?

The FTP and TFTP services are disabled (cyber security default setting). In your application, enable FTP or TFTP, if your security policy allows.

When you have an Ethernet device that uses FDR and you want to disable FTP, follow these steps:

- Enable FTP in your application.
- Invoke the ETH_PORT_CTRL (see *Modicon M580, Hardware, Reference Manual*) EFB (EthPort_Control_MX (see *EcoStruxure™ Control Expert, Communication, Block Library*) function for Unity Pro V8.0 projects) to disable FTP after the devices have accepted their configuration.
- To temporarily enable FTP to replace a non-communicating device, invoke the ETH_PORT_CTRL EFB (EthPort_Control_MX function for Unity Pro V8.0 projects).

Can I connect a PC to an RIO module port?

Yes, but PCs are not be able to communicate with any modules. We recommend you connect PCs (or any other non-RIO device) to these:

Connection	Port
DRS	DIO Cloud or DIO Sub Ring port
CPU	SERVICE port (configured as an access port)
BMENOS0300	DIO or SERVICE port
BM-CRA312-0 X80 EIO adapter module	SERVICE port (configured as an access port)

Function Blocks

Why aren't the PRINT_CHAR_QX and INPUT_CHAR_QX function blocks working with my Unity Pro 7.0 application, after I updated (or replaced) the BMX CRA 312 -0 X80 EIO adapter module?

The firmware in the BMX CRA 312 -0 module has evolved to increase its robustness. This evolution is not compatible with the PRINT_CHAR_QX and INPUT_CHAR_QX function blocks in Unity Pro 7.0.

Perform one of the following to make these function blocks operate:

- Migrate the application to Unity Pro 8.x.
 - or –
- Downgrade the BMX CRA 312 -0 module to version 1.30.

IP Addressing / FDR

Can I use the stored and clear IP rotary switch positions on the BM-CRA 312 -0 X80 EIO adapter modules?

We recommend that you do not use these switch positions (*see Modicon M580 Standalone, System Planning Guide for, Frequently Used Architectures*) on the rotary switches because they do not support I/O module management. The only way to manage I/O modules is to use the ones and tens positions.

IPsec

For questions regarding IP secure communications (IPsec), refer to BMENOC0301/11 guide (*see Modicon M580, BMENOC0301/0311 Ethernet Communications Module, Installation and Configuration Guide*).

Remote I/O

What happens if I measure an application response time (ART) that is higher than I expected?

If the MAST task is cyclic, the default RPI is set to 60 ms. If the actual execution time of the MAST task is lower than 120 ms, the ART is affected by the RPI.

Adjust the RPI value to your needs, or set your MAST task in periodic mode.

Time

How can I display the local time when %MW49...53 seem to be in UTC?

The words %MW49...53 are in universal coordinated time (UTC), not in local time. If you require local time, use the RRTC_DT function block. (**NOTE:** RRTC_DT_MS is also in UTC time.)

Topologies

Do we have to follow the topology rules given in the user guide?

Yes, the system has been tested with the topology rules provided (*see Modicon M580 Standalone, System Planning Guide for, Frequently Used Architectures*). The level of determinism and the operating characteristics of the network described in this document are based on a system designed according to these rules.

Can I connect DIO scanner devices (M340, Premium) to DIO ports or clouds or in a DIO network?

We recommend that you do not add these devices to DIO ports. Each DIO port on DRSs / BM•CRA312•0 X80 EIO adapter modules has a bandwidth that determines how much traffic is allowed on the M580 main ring. This bandwidth limitation can cause DIO scanner performance to decrease, which may be unacceptable in your network.

What type of distributed equipment can I connect to DIO ports or clouds?

You can connect devices that do not support 802.1D/Q tagging.

Example: Advantys, TeSys-T, Momentum, and non-Schneider devices

Can I access devices (via ping, PC tools) in an M580 network via the SERVICE port (ETH1) when it is configured in port mirror mode?

No. When the SERVICE port is configured in port mirror mode, you cannot access devices, that is, you cannot ping other devices by connecting a PC to ETH1 in port mirror mode. When the SERVICE port is configured in access mode, then you can access devices in an M580 network via any tool.

Unity Loader

What is the correct procedure to update the BME NOC 03•0 Ethernet communication module?

Update the BME NOC 03•0 module by connecting Unity Loader to the Ethernet port of the BME NOC 03•0 module. The connection can be direct or via a dual-ring switch (DRS).

You cannot use the USB port of the CPU to access the BME NOC 03•0 module. The following message appears: "Upgrade error: Com = CallBack (on channel 10 index 0 and channel 10 index 5)."

Can I update the CPU's firmware via the BME NOC 03•0 module?

Yes, you can connect the BME NOC 03•0 module's embedded Ethernet switch to the CPU. Check that the BME NOC 03•0 module is running properly before starting the update procedure.

You cannot, however, update the CPU if Unity Loader is connected on the BME NOC 03•0 module's IP address.

Control Expert

The IP address field in Control Expert is grayed out. How can I modify this field?

Remove your application from the virtual connected mode to edit the IP address field.

USB

Why am I unable to connect to the CPU via the USB port?

Possible cause:

You may have connected the PC to the CPU before installing the USB driver. On a PC running Windows®, install the driver before connecting your PC to the CPU. Otherwise, Windows® installs a default driver that does not match the CPU requirements.

Possible solution:

- In Windows® configuration panel, uninstall the driver attached to the CPU.
- Install the driver (from the driver DVD, the Control Expert DVD, or the Unity Loader DVD).
- Reconnect the USB cable between the CPU and the PC.

Web

Why are the CPU webpages not displaying properly?

Possible cause:

The CPU webpages are designed to work with Internet Explorer 8 configured in standard mode. The pages do not display properly when configured in Internet Explorer 7 compatibility mode.

Possible solution:

Configure your Internet Explorer to work in Internet Explorer 8 standard mode

1. In Internet Explorer, click **Tools** → **Developer Tools** → **Browser Mode: IE8** → **Internet Explorer 8 Compatibility View**
2. In Internet Explorer, click **Tools** → **Developer Tools** → **Document Mode: IE8 Standards** → **Internet Explorer 8 Standards**



A

adapter

An adapter is the target of real-time I/O data connection requests from scanners. It cannot send or receive real-time I/O data unless it is configured to do so by a scanner, and it does not store or originate the data communications parameters necessary to establish the connection. An adapter accepts explicit message requests (connected and unconnected) from other devices.

ART

(application response time) The time a CPU application takes to react to a given input. ART is measured from the time a physical signal in the CPU turns on and triggers a write command until the remote output turns on to signify that the data has been received.

C

CPU

(central processing unit) The CPU, also known as the processor or controller, is the brain of an industrial manufacturing process. It automates a process as opposed to relay control systems. CPUs are computers suited to survive the harsh conditions of an industrial environment.

D

determinism

For a defined application and architecture, you can predict that the delay between an event (change of value of an input) and the corresponding change of a controller output is a finite time t , smaller than the deadline required by your process.

DRS

(dual-ring switch) A ConneXium extended managed switch that has been configured to operate on an Ethernet network. Predefined configuration files are provided by Schneider Electric to downloaded to a DRS to support the special features of the main ring / sub-ring architecture.

F

FDR

(fast device replacement) A service that uses configuration software to replace an inoperable product.

FTP

(file transfer protocol) A protocol that copies a file from one host to another over a TCP/IP-based network, such as the internet. FTP uses a client-server architecture as well as separate control and data connections between the client and server.

I

IP address

The 32-bit identifier, consisting of both a network address and a host address assigned to a device connected to a TCP/IP network.

IPsec

(internet protocol security) An open set of protocol standards that make IP communication sessions private and secure for traffic between modules using IPsec, developed by the internet engineering task force (IETF). The IPsec authentication and encryption algorithms require user-defined cryptographic keys that process each communications packet in an IPsec session.

M

MAST

A master (MAST) task is a deterministic processor task that is run through its programming software. The MAST task schedules the RIO module logic to be solved in every I/O scan. The MAST task has two sections:

- IN: Inputs are copied to the IN section before execution of the MAST task.
- OUT: Outputs are copied to the OUT section after execution of the MAST task.

Modbus

Modbus is an application layer messaging protocol. Modbus provides client and server communications between devices connected on different types of buses or networks. Modbus offers many services specified by function codes.

R

RPI

(requested packet interval) The time period between cyclic data transmissions requested by the scanner. EtherNet/IP devices publish data at the rate specified by the RPI assigned to them by the scanner, and they receive message requests from the scanner at each RPI.

T**TFTP**

(trivial file transfer protocol) A simplified version of *file transfer protocol* (FTP), TFTP uses a client-server architecture to make connections between two devices. From a TFTP client, individual files can be uploaded to or downloaded from the server, using the user datagram protocol (UDP) for transporting data.

U**UTC**

(coordinated universal time) Primary time standard used to regulate clocks and time worldwide (close to former GMT time standard).



B

- BMECRA312x0
 - update, *27, 33*
- BMECXM0100
 - update, *19*
- BMEH58xxxx
 - update, *33*
- BMENOC03x1
 - update, *17, 33*
- BMEP58xxxx
 - update, *13*
- BMEXBPxxxx
 - update, *37*
- BMXCRA312x0
 - update, *27, 33*

C

- CPU
 - update, *13, 19*

E

- Ethernet communications module
 - update, *17*

F

- FAQ
 - update, *39*
- firmware
 - update, *14, 17, 33, 37*
 - upgrade, *14, 17, 33*
- firmware update, *20*
- frequently asked questions, *39*

H

- Hot Standby
 - update, *33*

R

- rack
 - update, *37*

S

- switch
 - update, *33*

U

- Unity Loader
 - firmware update, *20*
- update
 - BMECRA312x0, *27, 33*
 - BMECXM0100, *19*
 - BMEH58xxxx, *33*
 - BMENOC03x1, *17, 33*
 - BMEP58xxxx, *13*
 - BMEXBPxxxx, *37*
 - BMXCRA312x0, *27, 33*
 - CPU, *13, 19*
 - Ethernet communications module, *17*
 - FAQ, *39*
 - firmware, *14, 17, 33, 37*
 - Hot Standby, *33*
 - rack, *37*
 - switch, *33*
- update firmware, *20*
- upgrade
 - firmware, *14, 17, 33*

