Modicon M580 Controller Firmware

Installation Guide

Original instructions

Schneider Electric

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As part of a group of responsible, inclusive companies, we are updating our communications that contain non-inclusive terminology. Until we complete this process, however, our content may still contain standardized industry terms that may be deemed inappropriate by our customers.

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About the Book

Document Scope

This manual describes the procedures for updating a Modicon M580 controller firmware from version 3.20 or earlier to 4.10 or later.

NOTE: These instructions do not apply to:

- Modicon M580 controller firmware after it has been upgraded to version 4.10 or later.
- Modicon M580 Safety controllers.

Update Procedure

The update procedure is a maintenance operation that consists in changing a controller firmware. It requires the controller to be in *STOP* mode and disconnected from the systems and applications it effects.

NOTICE
INOPERABLE EQUIPMENT
Stop the controller before any firmware update or firmware check with Unity Loader or EcoStruxure Automation Device Maintenance software.
Failure to follow these instructions can result in equipment damage.

Validity Note

The characteristics that are described in the present document, as well as those described in the documents included in the Related Documents section below, can be found online. To access the information online, go to the Schneider Electric home page www.se.com/ww/en/download/

The characteristics that are described in the present document should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the document and online information, use the online information as your reference.

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 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)
EcoStruxure Automation Device Maintenance, Firmware Upgrade Tool, Online Help	EADM (English, French, German, Italian, Spanish, Chinese).

Product Related Information

> # ⚠ WARNING
>
> **LOSS OF CONTROL**
>
> - Perform a Failure Mode and Effects Analysis (FMEA), or equivalent risk analysis, of your application, and apply preventive and detective controls before implementation.
> - Provide a fallback state for undesired control events or sequences.
> - Provide separate or redundant control paths wherever required.
> - Supply appropriate parameters, particularly for limits.
> - Review the implications of transmission delays and take actions to mitigate them.
> - Review the implications of communication link interruptions and take actions to mitigate them.
> - Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and error conditions) according to your risk assessment, and applicable codes and regulations.
> - Apply local accident prevention and safety regulations and guidelines.[1]
> - Test each implementation of a system for proper operation before placing it into service.
>
> **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

[1] For additional information, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control* and to NEMA ICS 7.1 (latest edition), *Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems* or their equivalent governing your particular location.

Interrupting the update procedure before it has completed will cause the connection to be lost and can cause irreparable damage to the Modicon M580 controller.

> # *NOTICE*
>
> **INOPERABLE EQUIPMENT**
>
> During the transfer of the firmware file:
>
> - Do not remove power from the Modicon M580 controller.
> - Do not remove power from the PC.
> - Do not exit the 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.**

Safety Information

Important Information

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

- 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 are 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:

(In case of divergence or contradiction between any translation and the English original, the original text in the English language will prevail.)

- 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 required by the operator should be accessible to the operator. Access to other controls should be restricted to prevent unauthorized changes in operating characteristics.

Updating the Firmware

This section contains the step-by-step instructions for upgrading the Modicon M580 controller firmware from a previous version to 4.10 or later.

New firmware version 4.10 (and later) for the Modicon M580 has an enhanced integrity check mechanism compared to previous versions. This evolution is performed in a two-step process.

To update Modicon M580 controller firmware from version 3.20 or earlier to 4.10 or later, follow the procedure set forth in this document.

NOTICE

INOPERABLE EQUIPMENT

- Do not upgrade with firmware version equal to or later than 4.01 any of the following Modicon M580 commercial references: BMEP581020(H), BMEP582020(H), BMEP582040(H), BMEP583020, BMEP583040, BMEP584020, BMEP584040, that have a Product Version (PV) inferior or equal to 3.

- If you intend to upgrade the M580 controller with a firmware version equal to or later than 4.01, and there is a Modicon M580 remote terminal unit (RTU) module in your configuration, first upgrade the RTU module to firmware version 03.02.02 or later and test your application.

- If you intend to upgrade the M580 controller with a firmware version equal to or later than 4.01, and there is a Modicon BMENOC0301/BMENOC0311 module in your configuration, first upgrade the BMENOC0301/ BMENOC0311 module to firmware version 02.20 or later and test your application.

- If you intend to upgrade the M580 controller with a firmware version equal to or later than 4.01, and there is a Modicon BMENOC0321 module in your configuration, first upgrade the BMENOC0321 module to firmware version 1.09 or later and test your application.

Failure to follow these instructions can result in equipment damage.

NOTE:

- Verify that your engineering station can communicate with the Modicon M580 controller using FTP and HTTPS protocols. (Cybersecurity policies applied to some networks may block this update procedure.)

- The Product Version (PV) information can be found on the product label.

- After upgrading the controller firmware, you will be unable to downgrade to any previous firmware version earlier than version 4.10. Any attempt to downgrade or override the updated firmware will generate a detected error.

- Ensure the compatibility of your modules in your system (Refer to the firmware history).

Overview

The Modicon M580 controller undergoes two firmware changes during the update, as follows:

Initial state	V3.20 (or earlier)
	NOTE: V3.20 uses FTP protocol for firmware updates.
Step 1: Upgrade Controller to Modicon M580 Migration Firmware, page 12	
Intermediate state	V3.99 - Migration Firmware
	• Used only to update firmware to V4.10.
	• Accepts only secure firmware (SEDP files over HTTPS).
	• Does not accept applications.
	IP Address = 10.10.MAC5.MAC6
	NOTE:
	• After the update, the firmware password is reset to *fwdownload*
	• If power cycles to the controller, firmware reverts to V3.20.
Step 2: Upgrade Migration Firmware to Modicon M580 Secure Firmware, page 17	
Final state	V4.10 (or higher)
	• Firmware is more secure
	◦ Enhanced integrity check of the firmware
	◦ List of fixed vulnerability can be found at:
	https://www.se.com/ww/en/work/support/cybersecurity/security-notifications-archive.jsp
	• List of specific impact is found in firmware history.
	NOTE: After the upgrade, it is not possible to downgrade firmware to V3.20 or earlier.

NOTE: After the upgrade, the application configured in the controller remains the same as before the upgrade.

Downloading EcoStruxure Automation Device Maintenance

EcoStruxure Automation Device Maintenance and instructions for using it are available on the Schneider Electric website at the following URL:

https://www.se.com/sg/en/download/document/EADM_V3.1/

The version for this procedure is: EcoStruxure Automation Device Maintenance V3.1.147 and subsequent supporting version(s).

Step 1: Upgrade Controller to Modicon M580 Migration Firmware

Preliminary Tasks

Before beginning Step 1:

- Configure your firewall to allow PC to controller communications.
- Download the latest Modicon M580 migration firmware file from:

  https://www.se.com/ww/en/product-range/62098-modicon-m580/#software-and-firmware

- Confirm that the real time clock of your controller is correct.
- Confirm that you know the credentials of the controller application, including firmware password (default = *fwdownload*) and application password.

  NOTE: When you upgrade your Modicon M580 controller, it is important that you are in front of the equipment to monitor the progress of the upgrade. Further, you must maintain a point-to-point connection between your PC and the controller without intervening equipment such as switches. Do not attempt the upgrade remotely.

Using EcoStruxure Automation Device Maintenance

Using EcoStruxure Automation Device Maintenance indicated version, page 11, perform these tasks:

1. Perform this update using either one of the following ports of the Modicon M580 controller:

   - USB port
   - Ethernet service port (Port 1, connecting the PC directly to the service port).

2. Open EcoStruxure Automation Device Maintenance.

3. Navigate to **Settings > Global > Package Settings**, click the ellipsis (**…**), select the folder where you saved your .LDX firmware upgrade file and click **Apply**.
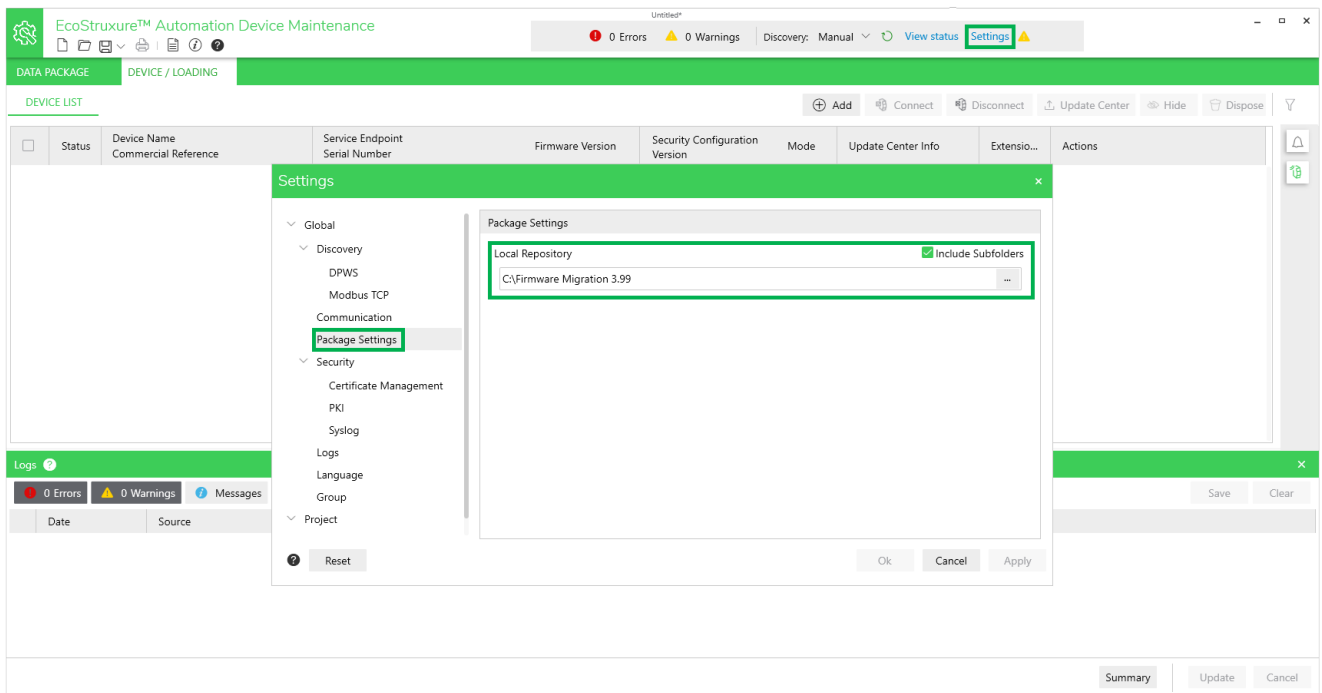
NOTE: Optionally, you can view the firmware available for update in the **DATA PACKAGE** screen.

4. In **DEVICE/LOADING**, click the **+Add** icon (⊕ Add) , then:
    - Type "bme" in the search bar and select **BME*****
    - Under **Connection**, select **FTP**.
    - Enter the **IP Address** of the controller:
        ◦ 192.168.10.1 for Service Port (set in controller program)
        ◦ 90.0.0.1 for the USB port
          NOTE: Port 21 is selected by default.

- Click **Add Device**.

  The new device appears in the **DEVICE Default Group**.

Device status is YELLOW: device is reachable on the network.

NOTE: If the status is not YELLOW, consult the EcoStruxure Automation Device Maintenance, Firmware Upgrade Tool, Online Help.

5. Click the **Set Credentials** icon ( ) and do one of the following:

   • If the application has no password: enter the firmware password (default or configured).

   • If the application has a password: enter both the application password and the firmware password (default or configured).

   • If there is no application in the controller, enter the firmware password (default or configured).

6. Click **Save and Connect**.

   Device status is GREEN: EcoStruxure Automation Device Maintenance has connected to the device successfully.
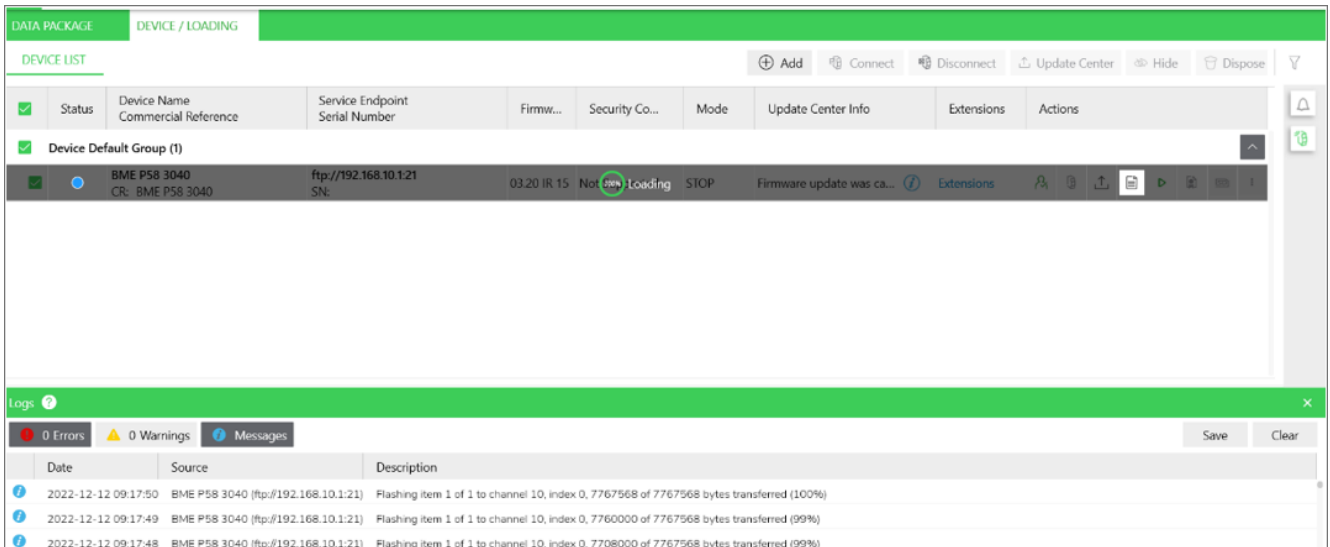
7. Click the **Update Center** icon ( ); then click **Firmware**; select the corresponding Modicon M580 migration firmware V3.99; and click **Save**.

   NOTE: The firmware version 3.99 is an intermediate version intended to enable the download of the final firmware version 4.10 in the Step 2 procedure, page 17. Version 3.99 is not an operational version.

8. Select the device you want to update, then click **Update**.

9. In the **Update Confirmation** dialog box, follow the instructions then click **Confirm**. A notification appears to the right of the dialog box.

10. Click on the **Notification** icon ( ), follow the instructions and click **Confirm**.

    Result: The firmware download begins:

11. Wait approximately one minute, until the controller LEDs enter the following states:

    • **RUN** is green and flashing

    • **ERR** is red and flashing

    • **IO** is red and flashing

    • **ETHMS** is green
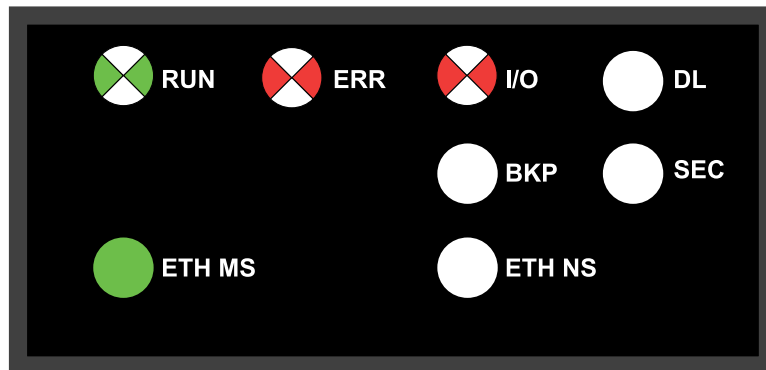
The controller firmware is now upgraded to V3.99. Proceed to the .

NOTE: If power is interrupted to the controller, it will restart with firmware V3.20.

NOTE: If you see a different combination of LEDs at the end of this procedure, an error has been detected during initial phase of the upgrade. The upgrade procedure cannot be completed and you will need to power cycle the controller to return it to V3.20. In this event, contact your local Schneider Electric service representative and provide following information:

• The sequence of LEDs flashing.

• The DiagFile, which you can download in Control Expert by clicking the **Help > About EcoStruxure Control Expert > Technical support**.

Step 2: Upgrade Migration Firmware to Modicon M580 Secure Firmware

Preliminary Task

Before beginning Step 2:

- Configure your firewall to permit PC to controller communications.
- Download latest Modicon M580 firmware file from:

  https://www.se.com/ww/en/product-range/62098-modicon-m580/#software-and-firmware

- Confirm you can ping the Modicon M580 controller:
  - Through the service port at IP address 10.10.MAC5.MAC6.
  - Through the USB port at IP address: 90.0.0.1.

  The Modicon M580 controller acknowledges the ping if it is correctly configured on the same network.

  NOTE: When you upgrade your Modicon M580, it is important that you are in front of the equipment to monitor the progress of the upgrade. Further, you must maintain a point-to-point connection between your PC and the controller without intervening equipment such as switches. Do not attempt the upgrade remotely.

Using EcoStruxure Automation Device Maintenance

Use EcoStruxure Automation Device Maintenance with BMEx58x0x0_v04.10.XX on SEDP format to perform the following tasks:

1. Perform this update using either one of the following ports of the Modicon M580 controller:
   - USB port
   - Ethernet service port (Port 1, connecting the PC directly to the service port)
2. Open EcoStruxure Automation Device Maintenance.

3. Navigate to **Settings > Global > Package Settings**, click the ellipsis (**…**), select the folder where you saved your .SEDP firmware upgrade file and click **Apply**.

> **NOTE:** Optionally, you can view the firmware available for update in the **DATA PACKAGE** screen.

4. In **DEVICE/LOADING**, click the **+Add** icon (⊕ Add) , then:

- Type "bme" in the search bar and select **BME*** (modernized)**
- Under **Connection**, select **HTTP/HTTPS** and select the **Secure** checkbox.
- Enter the **IP Address** of the controller with firmware V3.99:
  - 10.10.MAC5.MAC6 for the service port
  - 90.0.0.1 for the USB port

    NOTE: Port 443 is selected by default.

Add Device ✕

Search Commercial Reference

| bme | ✕ |

Commercial Reference:*

BME***	
BME*** (modernized)	
BMEH582040	SV >= 04.02.02
BME H58 2040	SV <= 03.99 IR 4
BMEH584040	SV >= 04.02.02
BME H58 4040	SV <= 03.99 IR 4
BMEH586040	SV >= 04.02.02
BME H58 6040	SV <= 03.99 IR 4

Connection:*

HTTP/HTTPS ⌄

☑ Secure

IP Address:*

| 90.0.0.1 | ✕ | : | 443 |

❓ Note: Modernized = commercialized after 2019.
For more information, refer to the Schneider Electric Product Catalog

Add Device   Cancel

- Click **Add Device**.

The new device appears in the **DEVICE Default Group**:
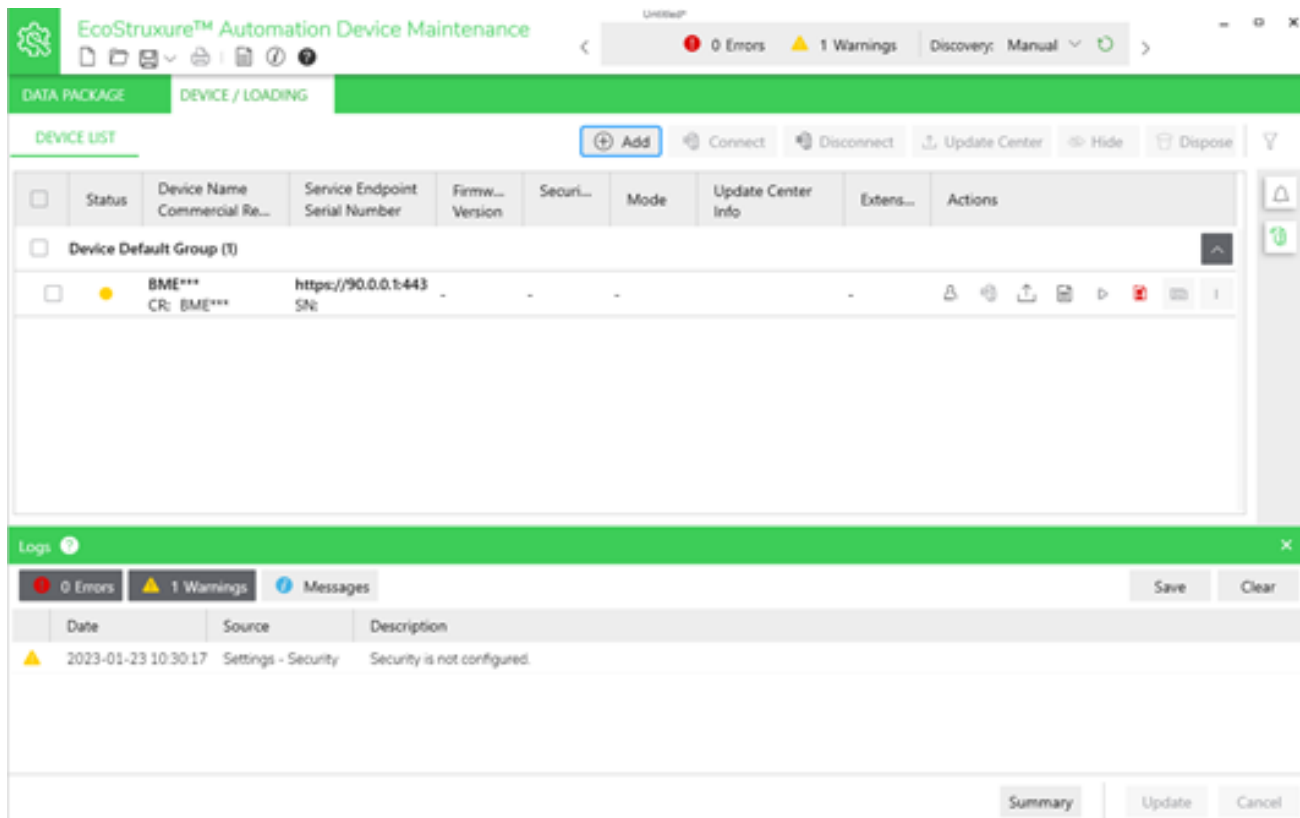
Device status is YELLOW, indicating the device is reachable on the network.

> **NOTE:** If the status is not YELLOW, consult the EcoStruxure Automation Device Maintenance, Firmware Upgrade Tool, Online Help.

Device certificate is RED ( ), indicating the device is untrusted on the PC.

5. In the **DEVICE/LOADING > DEVICE LIST > DEVICE DEFAULT GROUP**, click the red certificate icon, then in the **Certificate Information** dialog box, click **Trust**.

   • Click the RED certificate icon ( ).
   • Check the **Certificate Information** and, if you agree, click **Trust**.

6. Click the **Set Credentials** icon ( ) and enter:
   • **Device User Name**: loader
   • **Device password**: fwdownload

7. Click **Save and Connect**.

   > **NOTE:** These default credentials are used only for this Modicon M580 migration firmware V3.99.
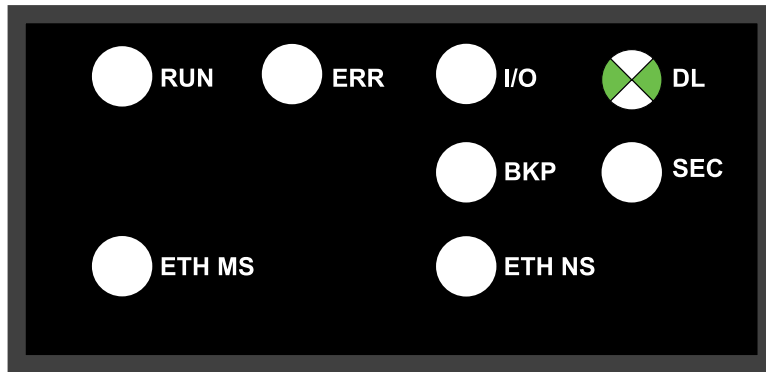
Device status is GREEN, indicating EcoStruxure Device Maintenance has successfully connected to the device:

8. Click the **Update Center** icon ( ); then click **Firmware**; select the corresponding Modicon M580 firmware 4.10 and then click **Save**.

9. **Select** the device you want to update, then click **Update**.

10. During the firmware upgrade process, the **DL** LED flashes green:

A message is displayed, indicating the percentage of firmware upgrade progress. When the upgrade is completed, the controller is restarted and the connection with EcoStruxure Automation Device Maintenance is lost.

NOTE: This process can take several minutes.

When the controller is completely restarted, a new connection with EcoStruxure Automation Device Maintenance is possible using the controller IP address and user credentials.

NOTE: After the package has been downloaded, the M580 controller will reboot.

After the reboot, the IP address of the controller is defined by the client application inside the controller. Thereafter, the EcoStruxure Automation Device Maintenance is unable to connect using the default IP address; instead the application IP address must be used.

EIO0000004992.00