

Harmony Edge Box HMI

Demo Setup Guide – EcoStruxure Machine Advisor



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Preface

(1) About this quick start guide

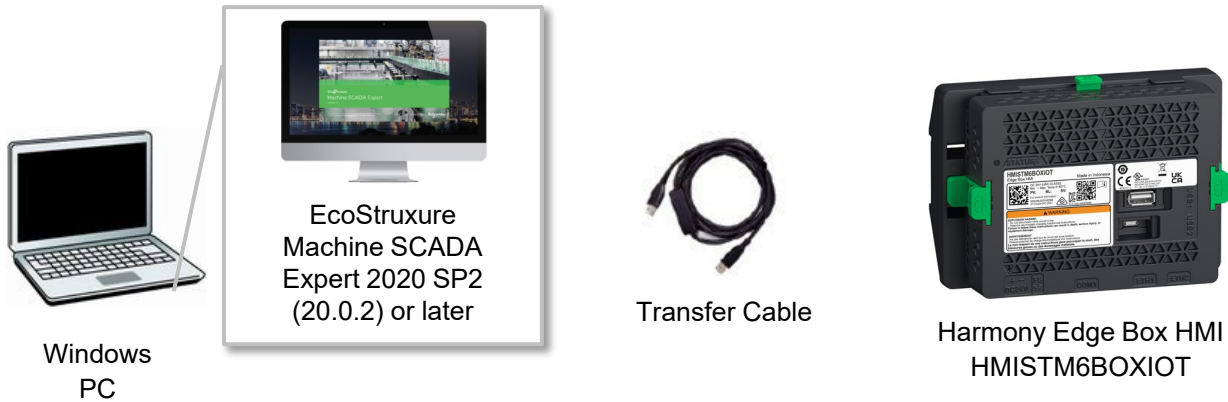
This Edge Box HMI Demo Setup Guide is intended for individuals using the Edge Box HMI and its software for demonstration purposes and not for a production environment. This publication will help you quickly configure hardware, software and cloud services.



Preface

(2) Building a development environment

Prepare the following environment.



(A) EcoStruxure Machine SCADA Expert

EcoStruxure Machine SCADA Expert is a development and runtime software that incorporates all the tools users need to create SCADA HMI applications, dashboards and OEE interfaces.

(B) Transfer Cable

Two ways of transferring project files



USB Cable
(Type A – Micro-B)

Use an optional USB transfer cable or commercial USB cable (Type A to Micro-B) for transfer.



LAN Cable

Use LAN cable (Ethernet cable) for transfer.

(C) Harmony HMISTM6BOXIOT

Please visit <https://www.se.com> for more information on the Harmony Edge Box HMI.



Harmony Edge Box HMI
HMISTM6BOXIOT

Preface

(3) How to get EcoStruxure Machine SCADA Expert

To create HMI Screen for the Edge Box HMI, the version of EcoStruxure Machine SCADA Expert needs to be V2020 SP2 or later.



You can download EcoStruxure Machine SCADA Expert Installer from the following link.

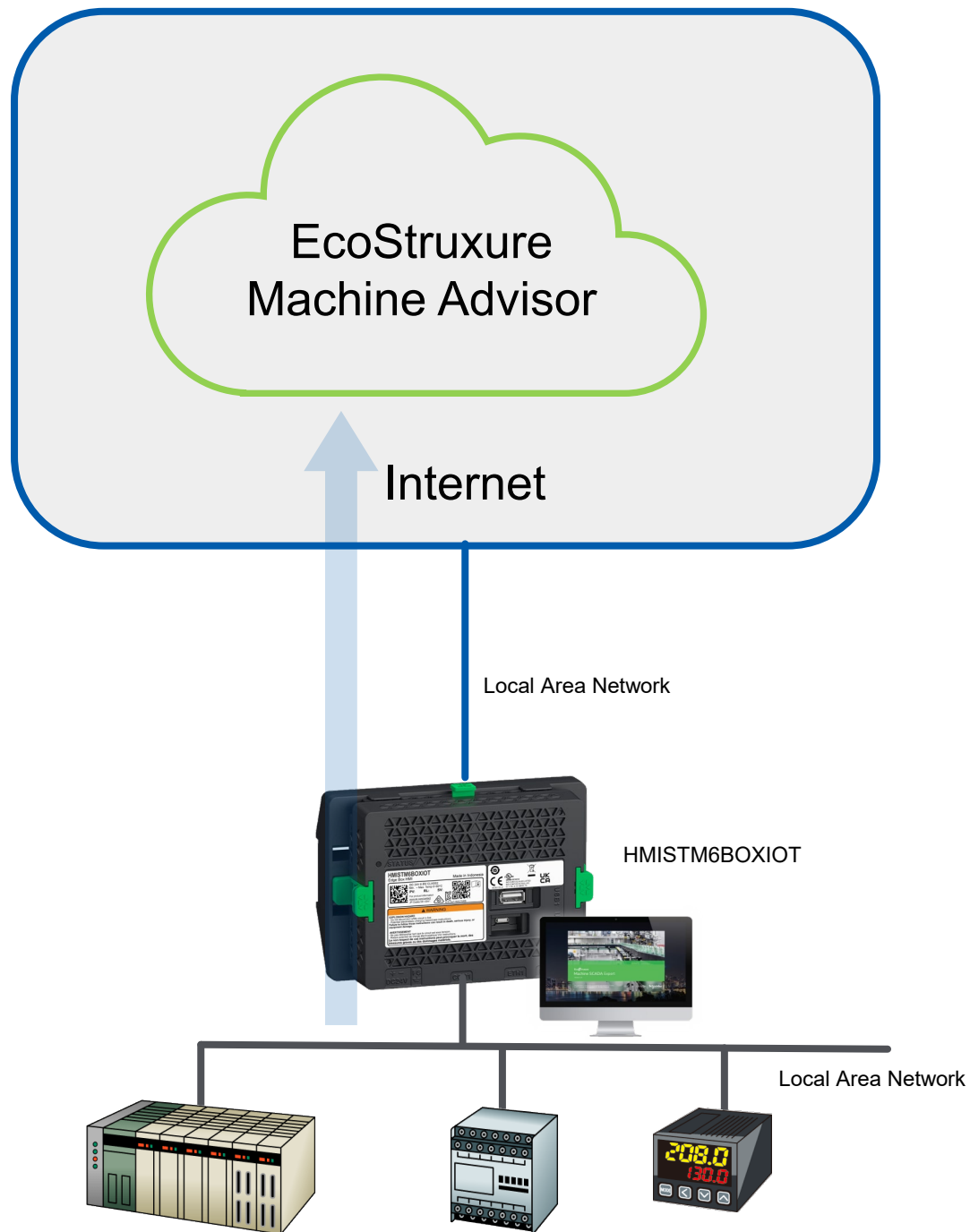
<https://www.se.com/ww/en/product-range/63734-ecostruxure-machine-scada-expert/?preferredCountry=yes#software-and-firmware>

You can use the software without a license in Evaluation Mode for 40 hours. After the evaluation period ends, the program automatically converts into Demo Mode until you apply a valid license. You cannot reactivate the Evaluation Mode even if you reinstall the software on your computer.

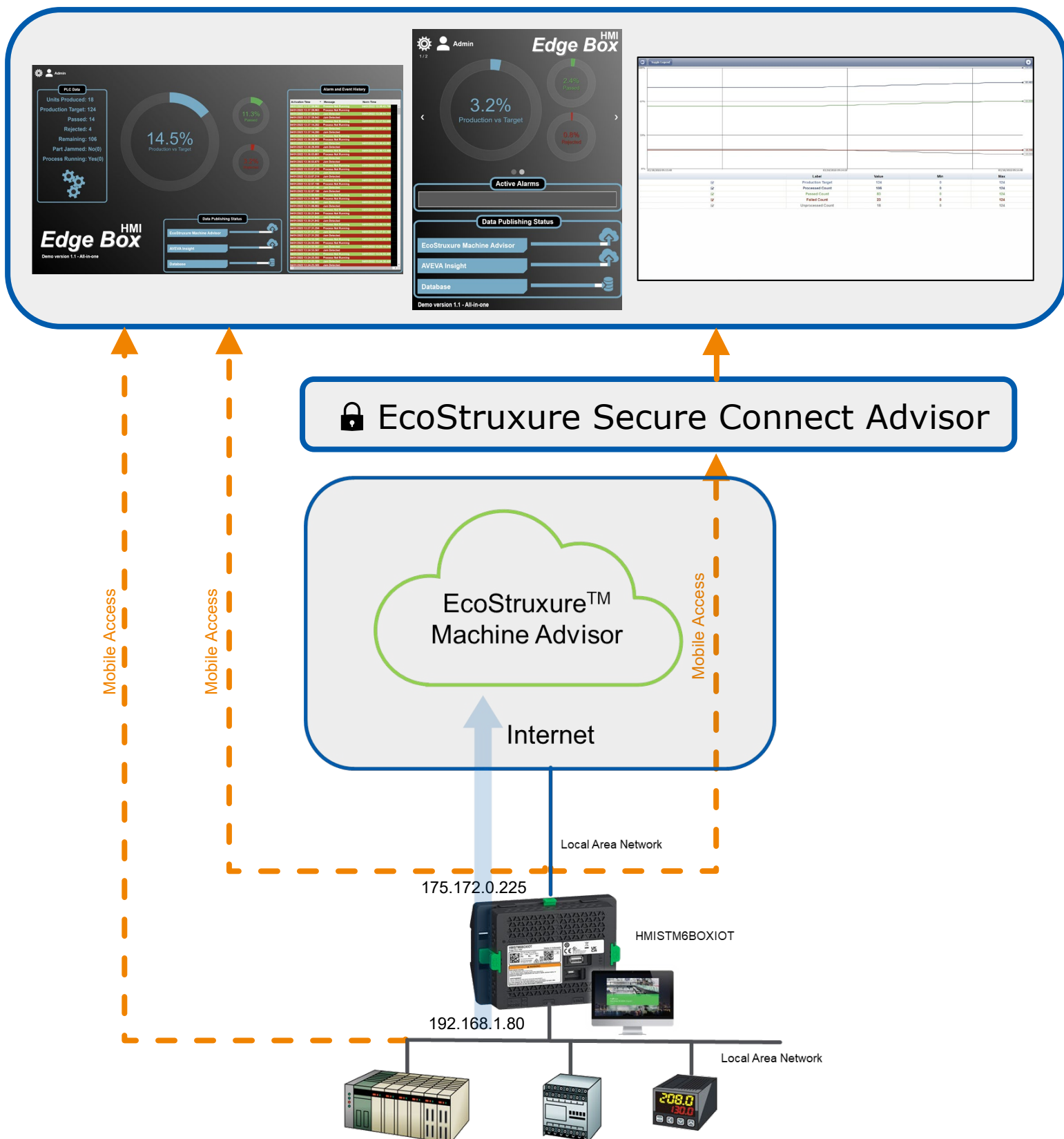
Please access the [FAQ page](#) to check how to activate EcoStruxure Machine SCADA Expert.

2. Harmony Edge Box HMI Demo Overview

The Harmony Edge Box HMI Demo – EcoStruxure Machine Advisor demonstrates pushing data from internal tags or external devices to the cloud: EcoStruxure Machine Advisor. Although a PLC or other device can supply data, for demonstration purposes data is internally generated.



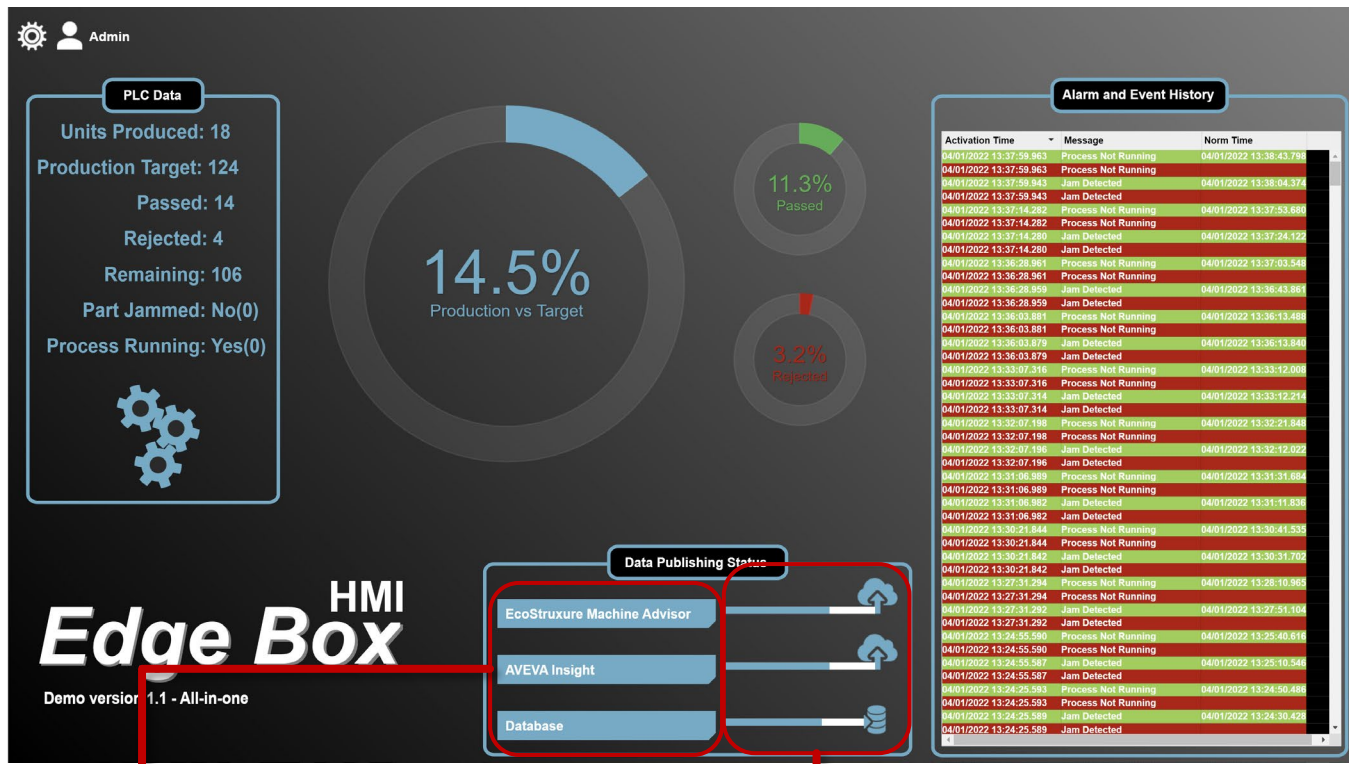
The Harmony Edge Box HMI cannot be used with an integrated display. However, you can view screens and more within a web browser using Mobile Access. Mobile Access can be used via one of the two possible IP addresses of the Edge Box HMI. For secure remote viewing utilise EcoStruxure Secure Connect Advisor + the local IP.



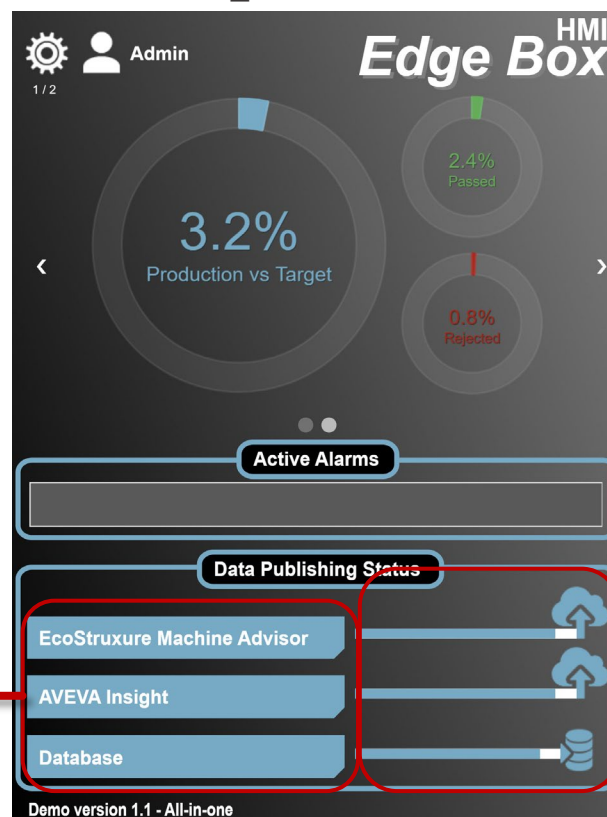
The demonstration project has two user accounts:

- Guest, password = (blank)
- Admin, password = Admin

main_desktop screen



main_mobile screen



Enable / Disable
Communication

Communication Status
and Links to Cloud Websites

3. Hardware Configuration



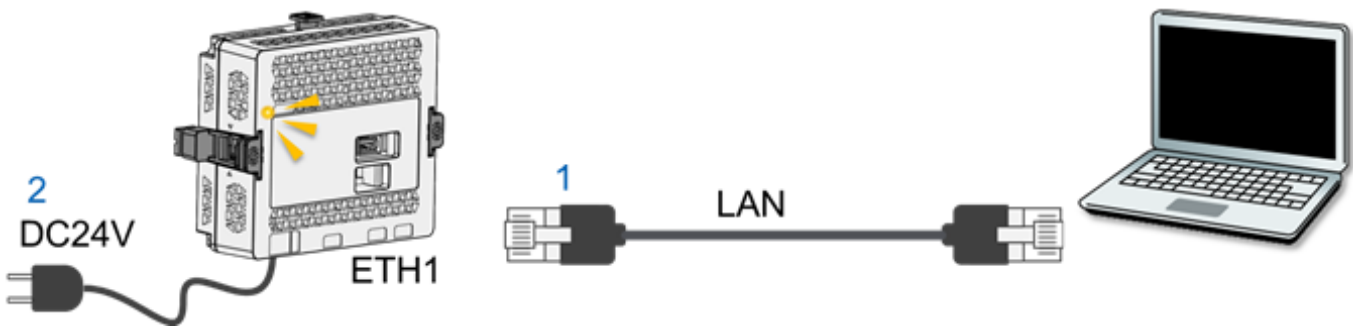
ETH1 – OT Layer
Manual IP
192.168.1.80

ETH2 – IT Layer
Automatic/DHCP
(e.g. 175.172.0.225)
or
Manual IP, Subnet, Gateway settings that
allows access to the Internet
(e.g. IP = 175.172.0.225
Subnet = 255.255.255.0
Gateway = 175.172.0.1)

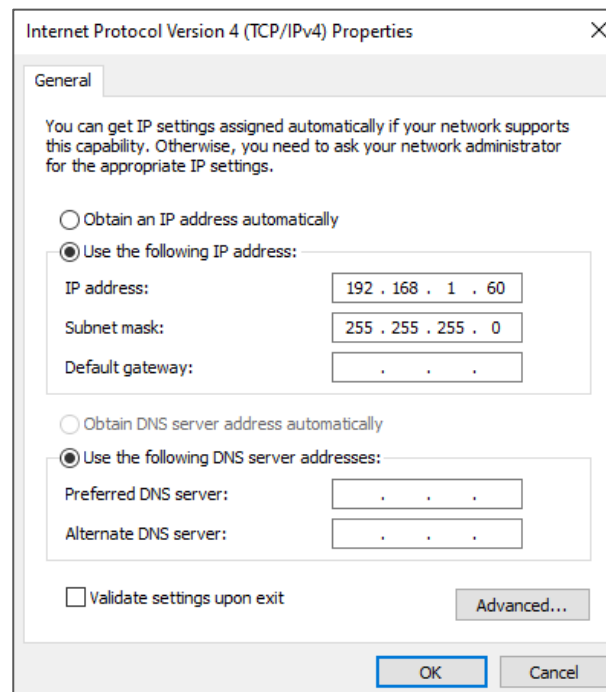
The Harmony Edge Box HMI will have two connections for demonstration purposes:

- ETH1 is primarily for the Operational Technology layer (OT) and is potentially connected to OT devices. For an easy demonstration experience a database service can also be connected to this layer. No internet connectivity on this port.
- ETH2 is primarily for the Internet Technology layer (IT) and is potentially connected to the internet via a router, Local Area Network (LAN) or other edge/IT devices. Connections to cloud services, databases and other services can be done from this port.

1. Connect a USB transfer cable (micro-B) to Edge Box HMI.
or Connect to the same network as PC (development environment) using ETH1 port of Edge Box HMI.
2. Turn on Harmony Edge Box HMI. The status LED flashes orange.



3. Set IP address of your computer as follows:
IP address: 192.168.1.60,
Subnet Mask: 255.255.255.0



4. Open a web browser on your PC, and in the address bar enter the IP address of Edge Box HMI.
 (Ethernet) <https://192.168.1.80>
 (USB) <https://169.254.100.100>

The message “Your connection is not private” is displayed. To continue, click Advanced and then click Proceed to *** (***) is the IP address).

5. Hardware Configuration screen is displayed.
 Set a login password and click [Submit]. e.g. !Se12345, and click [Submit]
 Note: The user name is “Admins” and cannot be changed.

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Hardware Configuration
Version 1.0

Password is not set

User Name
Admins

Create Password

Enter Password

Confirm Password

Submit

5

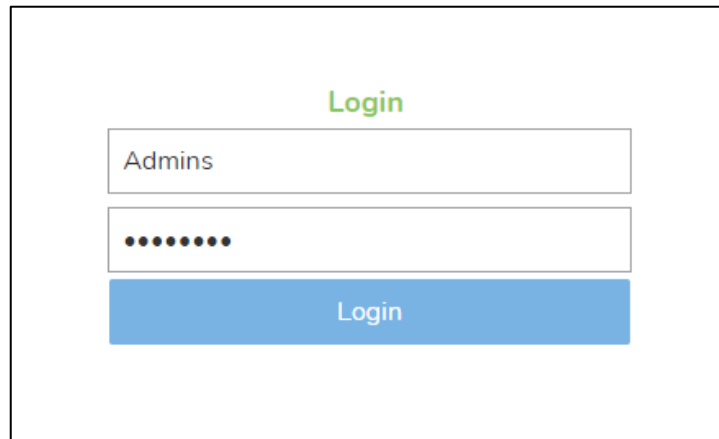
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The password must meet the following requirements:

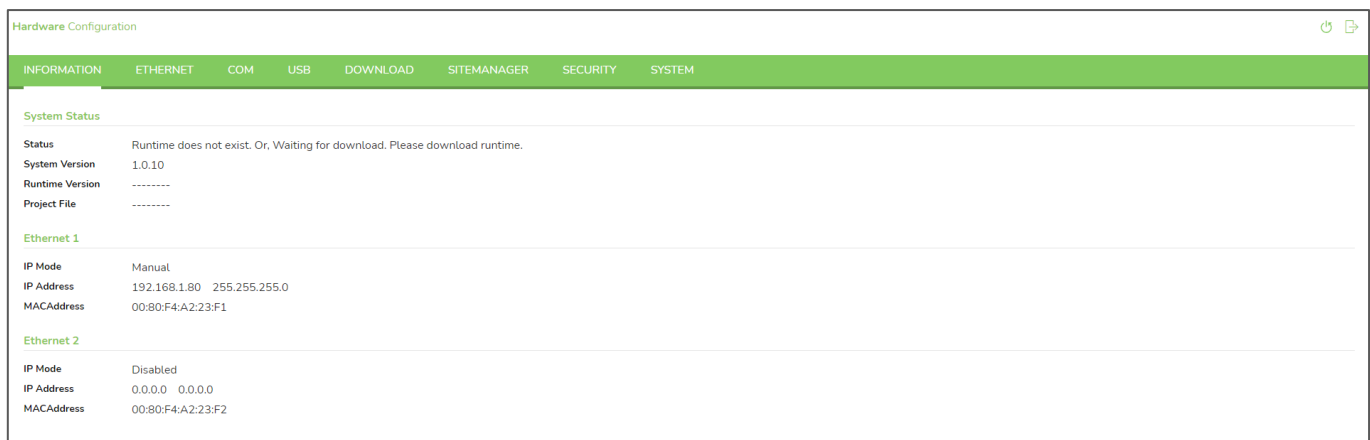
Number of characters	At least 8 single-byte characters, up to 64 characters
Types of characters	Use at least one of each of the following types of characters: <ul style="list-style-type: none"> • Uppercase letter (A-Z) • Lowercase letter (a-z) • Number (0-9) • Symbol (special character): ! # - = _ .

Note: If you forget the password, note that you will not be able to reset it. To restore the product to its original state (at time of purchase), contact customer support. All user data in the product will be lost.

6. Enter the User Name, Admins and the newly created password, e.g. !Se12345. Click [Login]



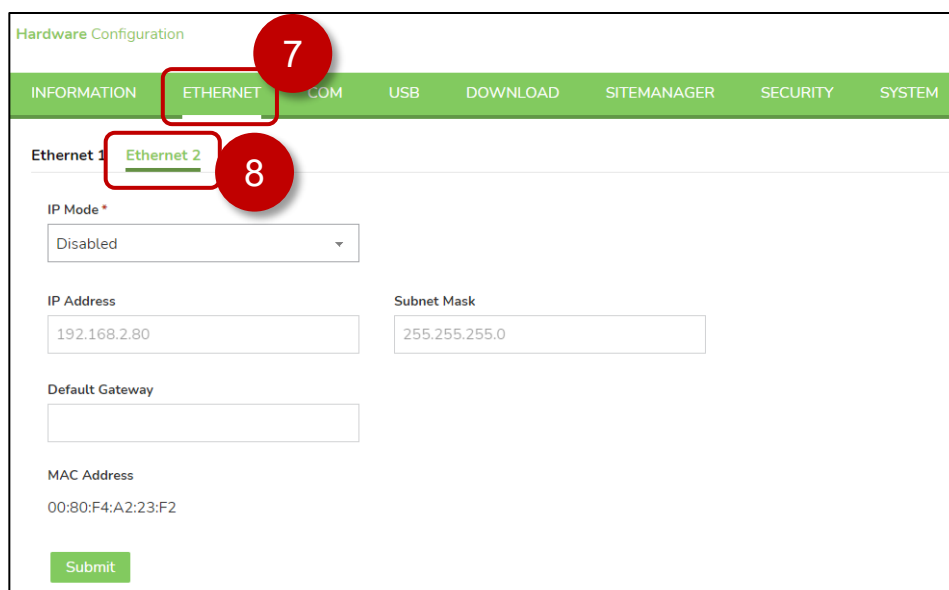
A login form titled "Login" in green text. It contains two input fields: the first is labeled "Admins" and the second is a password field with ten dots. Below the password field is a blue button labeled "Login".



A screenshot of the "Hardware Configuration" page. The page has a green header with tabs: INFORMATION, ETHERNET, COM, USB, DOWNLOAD, SITEMANAGER, SECURITY, and SYSTEM. The "ETHERNET" tab is selected. Under "System Status", it shows: Status (Runtime does not exist. Or, Waiting for download. Please download runtime.), System Version (1.0.10), Runtime Version (-----), and Project File (-----). Under "Ethernet 1", it shows: IP Mode (Manual), IP Address (192.168.1.80), and MACAddress (00:80:F4:A2:23:F1). Under "Ethernet 2", it shows: IP Mode (Disabled), IP Address (0.0.0.0), and MACAddress (00:80:F4:A2:23:F2).

7. Click [ETHERNET] to display the Ethernet Settings.

8. Click [Ethernet 2] to display ethernet port 2 settings.



A screenshot of the "Ethernet 2" settings page. The page has a green header with tabs: INFORMATION, ETHERNET, COM, USB, DOWNLOAD, SITEMANAGER, SECURITY, and SYSTEM. The "ETHERNET" tab is selected. Under "Ethernet 1", it shows: IP Mode (Disabled), IP Address (192.168.2.80), and Subnet Mask (255.255.255.0). Under "Ethernet 2", it shows: IP Mode (Disabled), IP Address (192.168.2.80), Subnet Mask (255.255.255.0), Default Gateway (empty field), and MAC Address (00:80:F4:A2:23:F2). A green "Submit" button is at the bottom. Red circles with numbers 7 and 8 highlight the "ETHERNET" tab and the "Ethernet 2" sub-tab respectively.

9. Set the [IP Mode] to [Automatic] or [Manual] . [Automatic] for DHCP or [Manual] to enter in the necessary settings to allow internet access.

Hardware Configuration

INFORMATION ETHERNET COM USB DOWNLOAD SITEMANAGER SECURITY SYSTEM

Ethernet 1 **Ethernet 2**

IP Mode * 9

Automatic

IP Address Subnet Mask

192.168.2.80 255.255.255.0

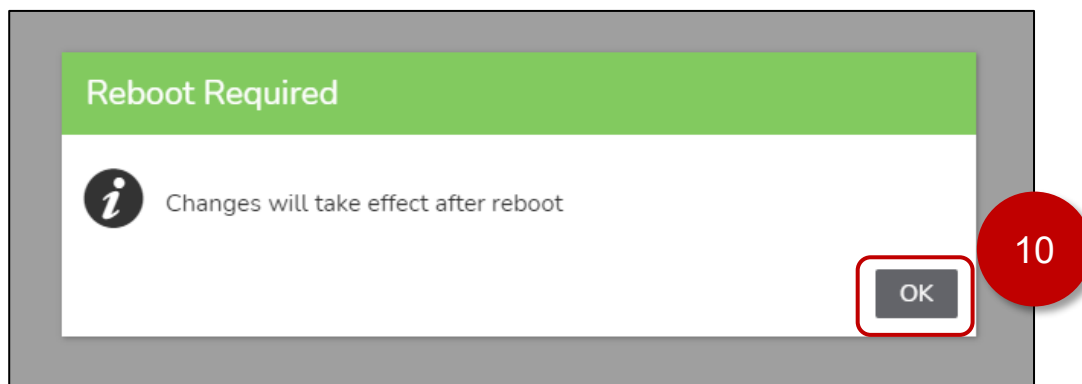
Default Gateway

MAC Address

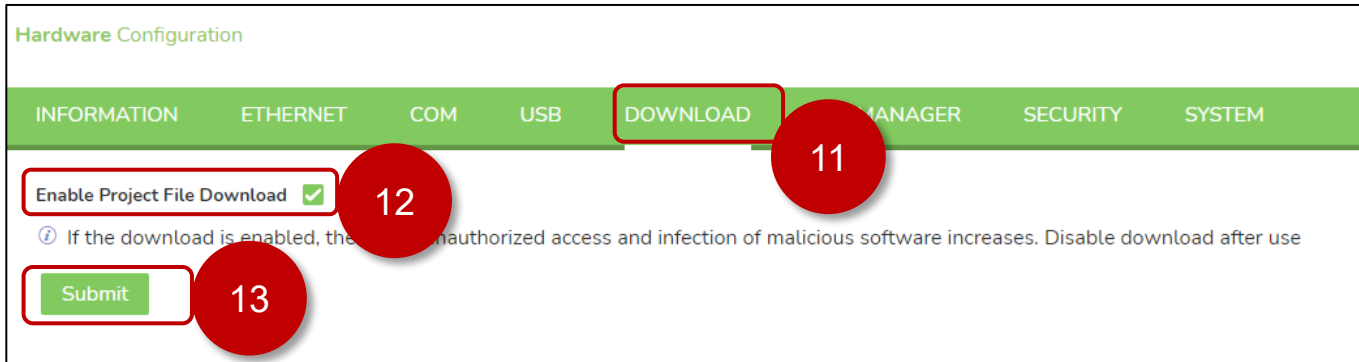
00:80:F4:A2:23:F2

Submit 10

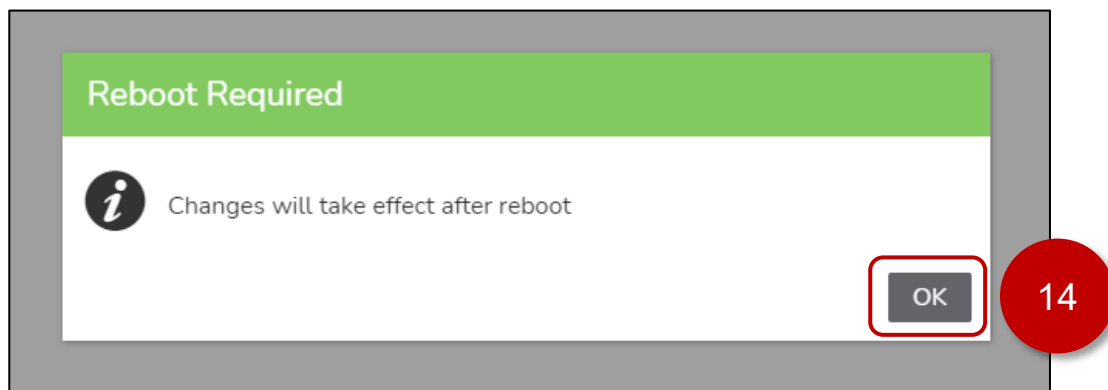
10. Click [Submit] to apply the ethernet setting. Note that the settings will only take effect after a reboot. [OK] to dismiss the Reboot Required dialog.



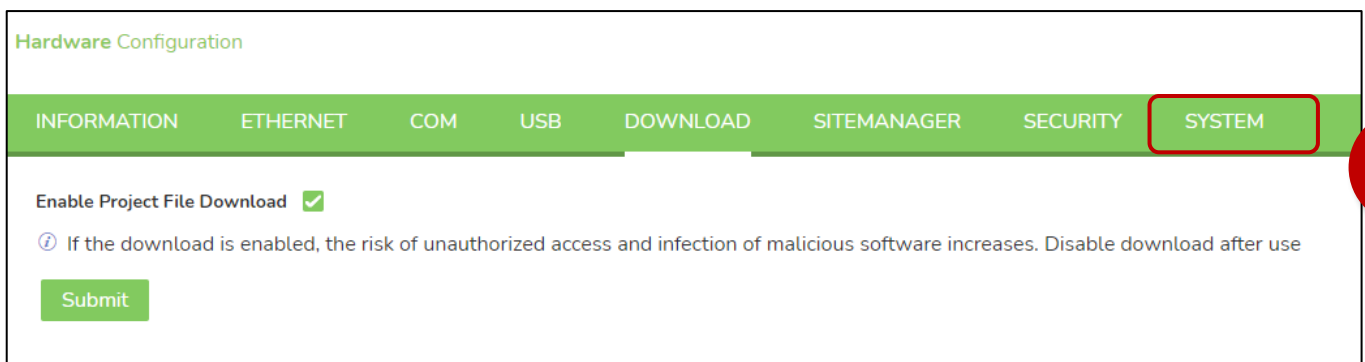
11. Click [DOWNLOAD].



12. Check [Enable Project File Download]
13. Click [Submit]. Changes will take effect after a reboot.
14. Click [OK] to accept the Reboot required message.



15. Click [SYSTEM]



16. Set the [Date], [Time], [Time-zone] for your region.

Hardware Configuration

INFORMATION ETHERNET COM USB DOWNLOAD SITEMANAGER SECURITY SYSTEM

Date and Time Firmware Update Factory Reset Backup and Restore Configuration

Date
2022-04-12

Time
05:56:00 PM

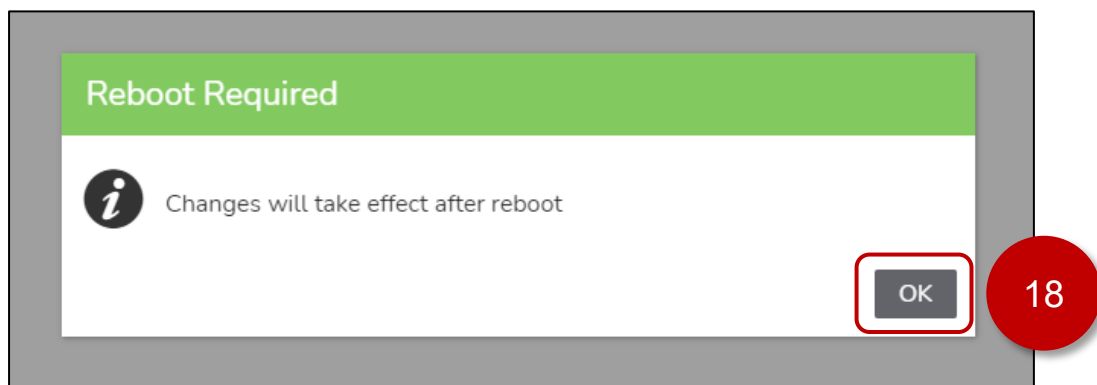
Time-zone
(UTC-04:00) Canada/Eastern

Synchronized with NTP Server ☐

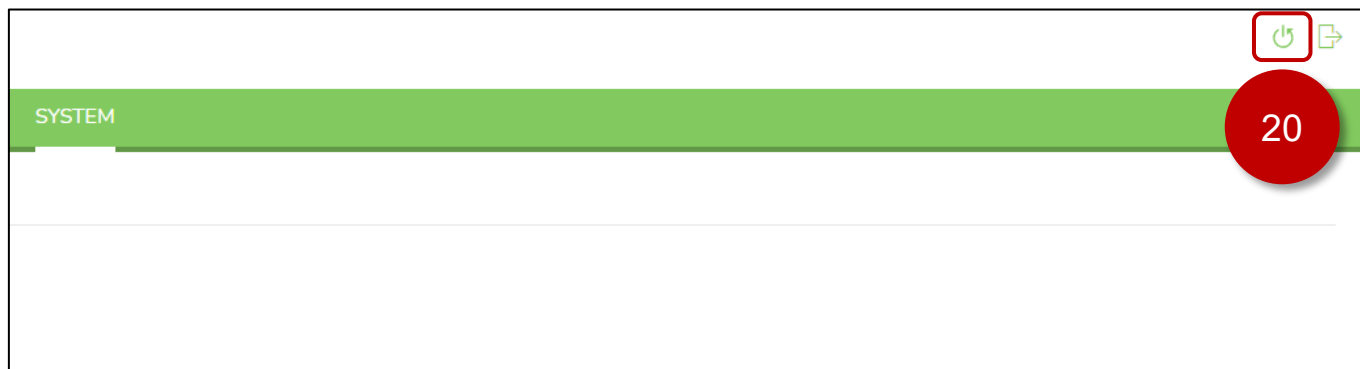
NTP Server

Submit

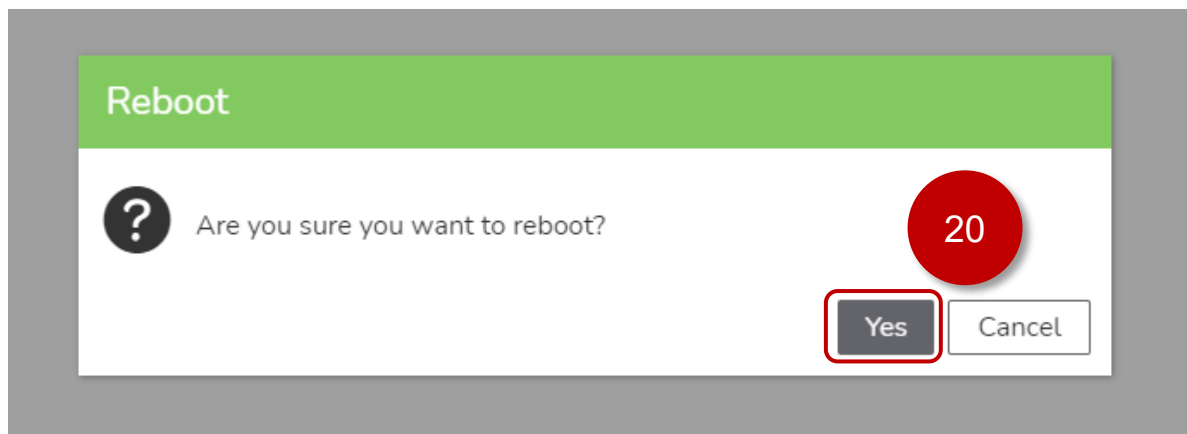
17. Click [Submit], changes will take effect after reboot.
18. Click [OK] to dismiss the Reboot Required dialog.



19. Click the [Reboot] icon  at the top right of the web page.



20. Click [Yes] in the Reboot dialog.



21. After the Edge Box HMI has rebooted. Confirm the [Ethernet 2] Settings, [Enable Project File Download] check box, [Date], [Time], [Time-zone] are as previously selected.

Hardware Configuration

INFORMATION ETHERNET COM USB DOWNLOAD SITEMANAGER SECURITY SYSTEM

System Status

Status Runtime does not exist. Or, Waiting for download. Please download runtime.

System Version 1.0.10

Runtime Version -----

Project File -----

Ethernet 1

IP Mode Manual

IP Address 192.168.1.80 255.255.255.0

MACAddress 00:80:F4:A2:23:F1

Ethernet 2

IP Mode Automatic

IP Address 175.172.0.205 255.255.255.0


MACAddress 00:80:F4:A2:23:F2

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Hardware Configuration

INFORMATION ETHERNET COM USB DOWNLOAD SITEMANAGER SECURITY SYSTEM

Enable Project File Download ☒

 If the download is enabled, the risk of unauthorized access and infection of malicious software increases. Disable download after use

Submit


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Hardware Configuration


INFORMATION ETHERNET COM USB DOWNLOAD SITEMANAGER SECURITY SYSTEM

Date and Time Firmware Update Factory Reset Backup and Restore Configuration


Date

2022-04-12 

Time

05:56:00 PM 

Time-zone

(UTC-04:00) Canada/Eastern 

Synchronized with NTP Server ☐

NTP Server

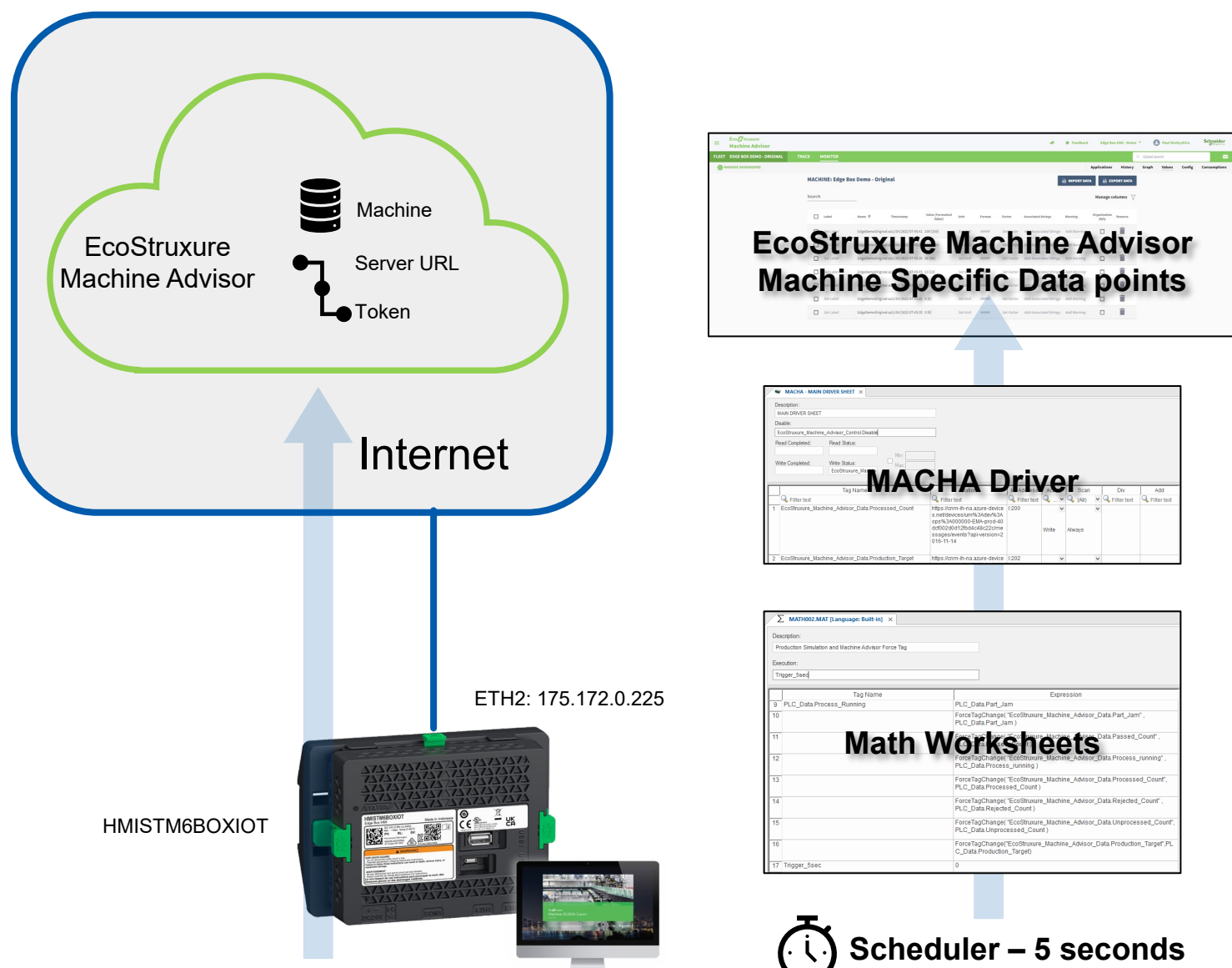
Submit

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4. EcoStruxure Machine Advisor Configuration

Overview

The Harmony Edge Box HMI Demo – EcoStruxure Machine Advisor uses the MACHA driver to communicate to an EcoStruxure Machine Advisor account. A machine definition created within EcoStruxure Machine Advisor is required. Data will be sent to the machine definition every 5 seconds securely using HTTPS. Normally the driver will only send data when a tag changes value. For tags to be written periodically the ForceTagChange() built-in function is used to update the tag's timestamp and value every 5 seconds based on the scheduler. Changing the timestamp triggers the MACHA worksheet to send the value even if the value has not actually changed. All data in the demo is internally generated using one or more math worksheets.

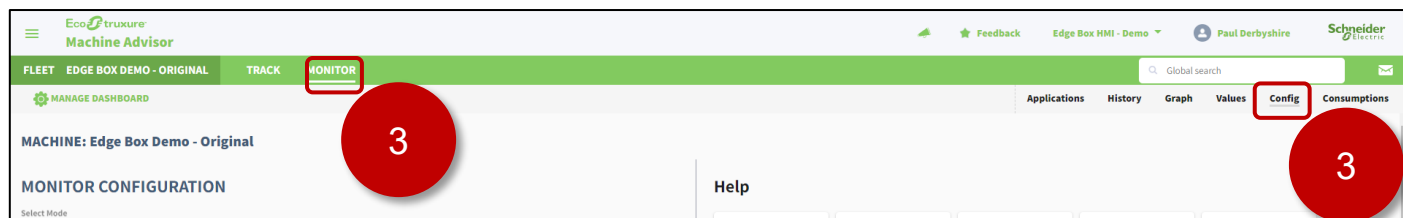
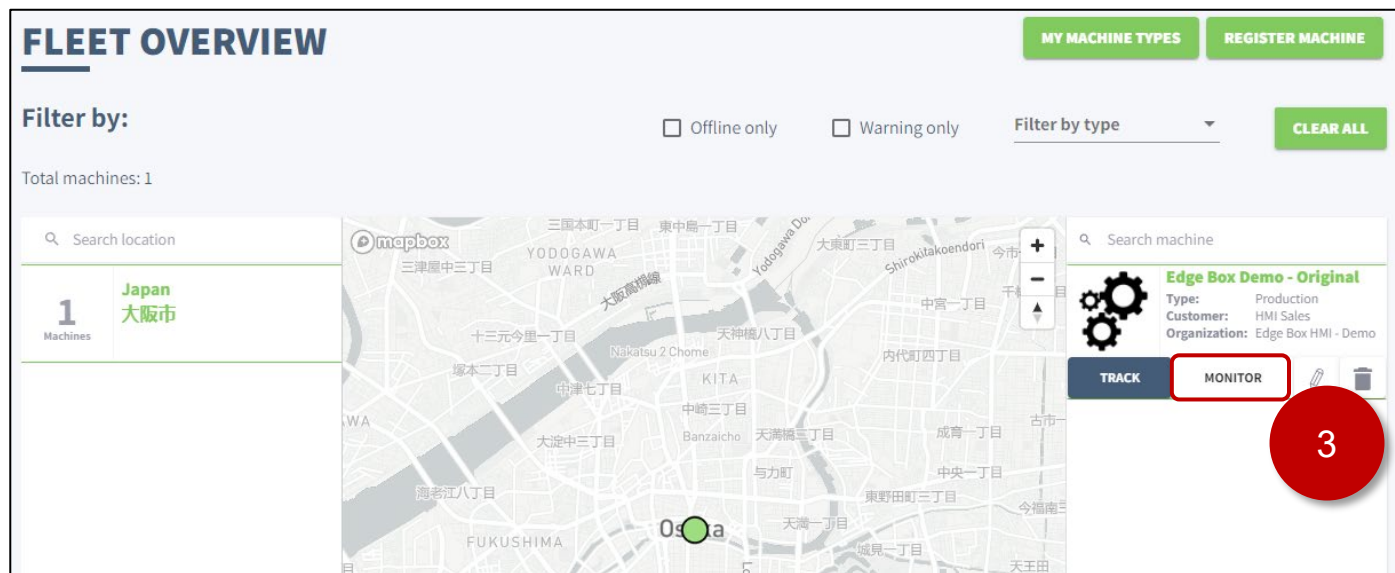


EcoStruxure Machine Advisor Machine Connection

To establish a connection to EcoStruxure Machine Advisor you will need the following:

- EcoStruxure Machine Advisor Account
- Purchaser Configured in Organization settings.
- Registered Machine
- Server Address
- Token

1. Sign in to EcoStruxure Machine Advisor <https://ecostruxure-machine-advisor.se.app/welcome>
2. Follow the steps shown in the tutorial video to create a new Registered Machine <https://youtu.be/g4hNI0K62H0>
3. Select the machine and go to the configuration page [Monitor] -> [Config].



4. Select Mode: [Connect your machine]
5. Select Plan: Select your appropriate plan. For example, [Pay As You Go]
6. Select Gateway: [Custom]
7. Select Format: [Tango]
8. Select Transport: [HTTPs]

9. Click [+New Token], leave the duration as default (10 years) and [Create] to create a new token.

10. Generate new token, check the “I confirm...” check box to generate a new token and click [Yes].

11. Copy the string in Server box and paste it on Notepad.
12. Copy the string in Token box and paste it on Notepad.

Generated Configuration

Protocol:


Custom header 1:

Server:

Connection string:


[+ New Token](#)

The last generated token is valid for 9 Years 11 Months 30 Days.

Success! 

You have successfully added a new access token. Copy the token Now!

Token:

 Warning! Make sure you copy the above token now.
We do not store it and you will not be able to see it again.

Notepad

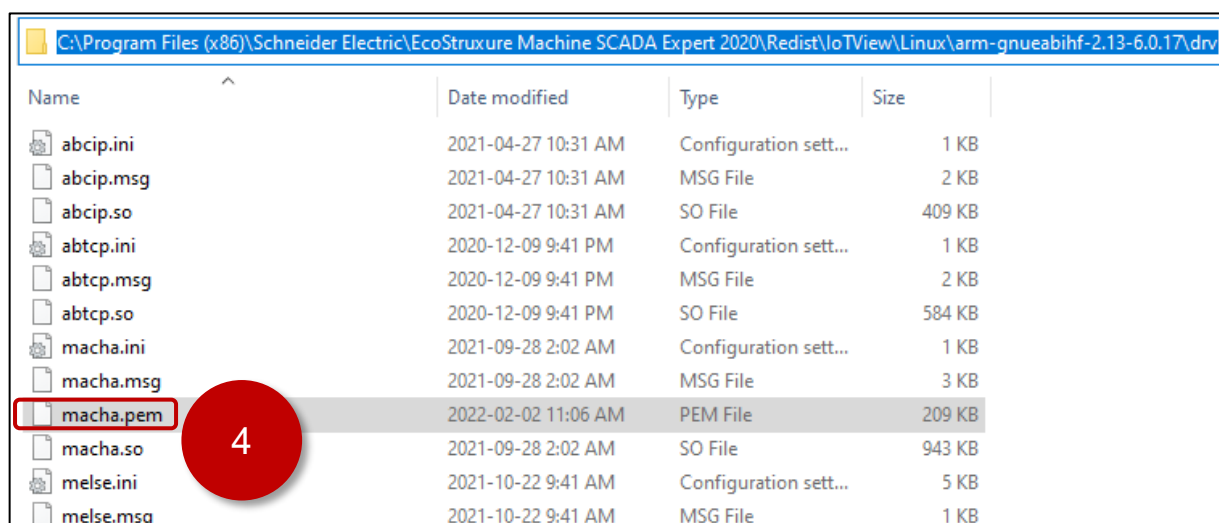
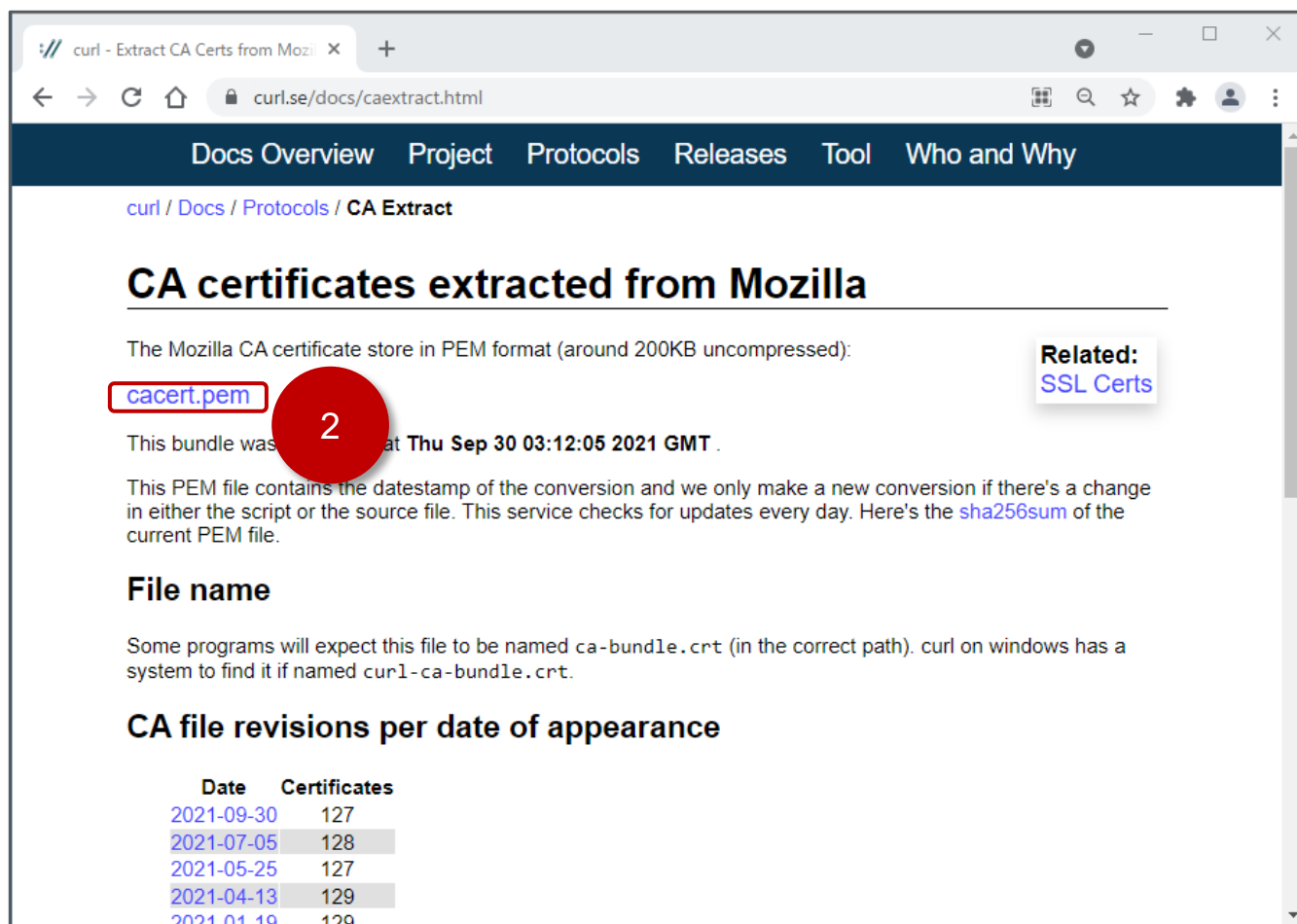
File Edit View Help

https://cnm-ih-na.azure-devices.net/devices/urn%3Adev%3Aops%3A000000-EMA-prod-XXXXXXXXXXXXXXXXXXXX
XXXX/messages/events?api-version=2016-11-14

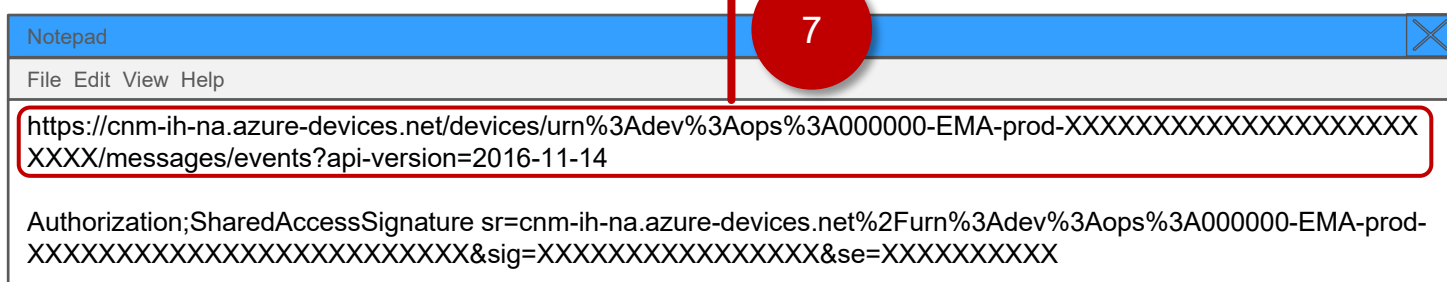
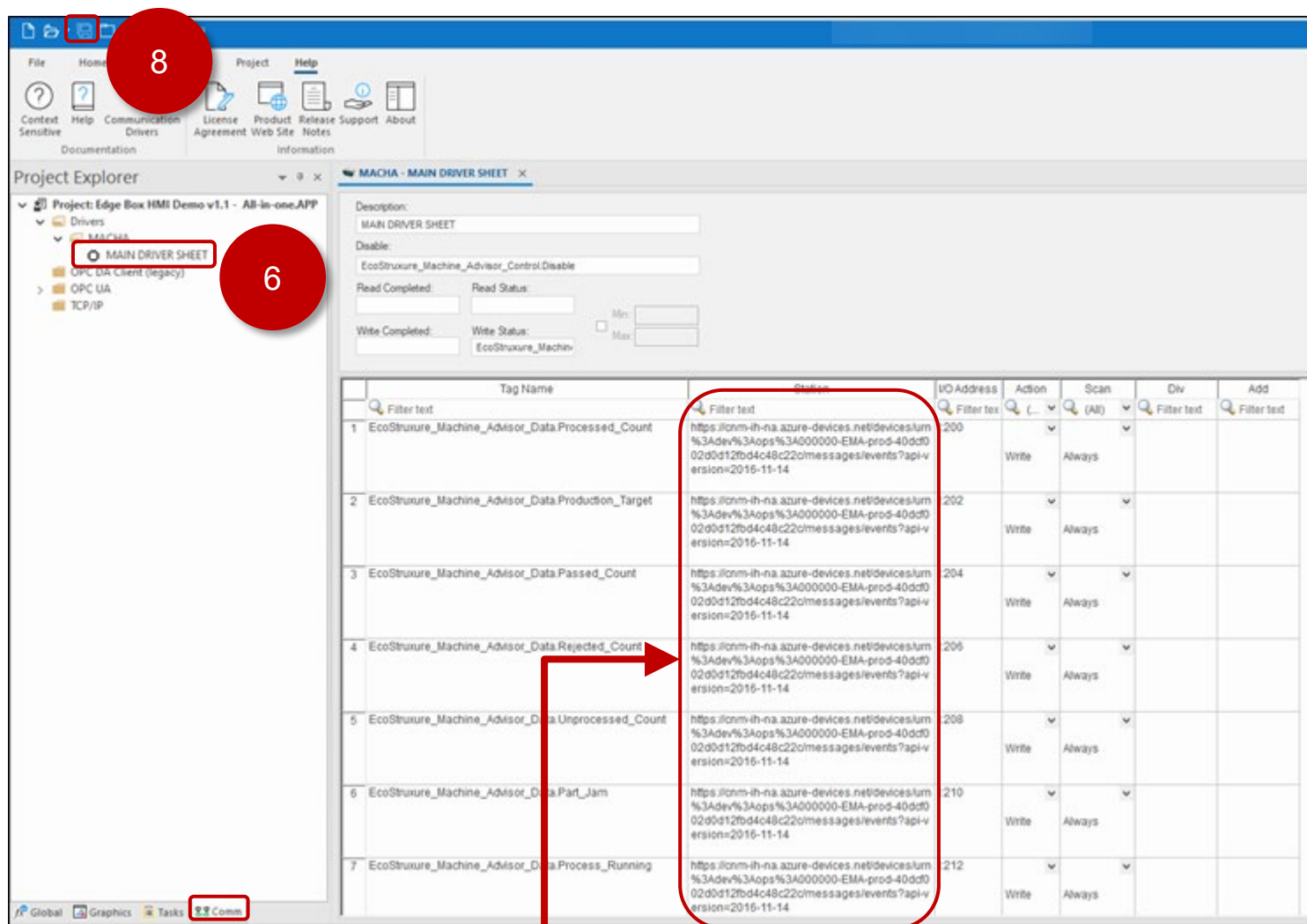
Authorization;SharedAccessSignature sr=cnm-ih-na.azure-devices.net%2Furn%3Adev%3Aops%3A000000-EMA-prod-
XXXXXXXXXXXXXXXXXXXX&sig=XXXXXXXXXXXXXXXXXXXX&se=XXXXXXXXXXXX

EcoStruxure Machine SCADA Expert Project Settings

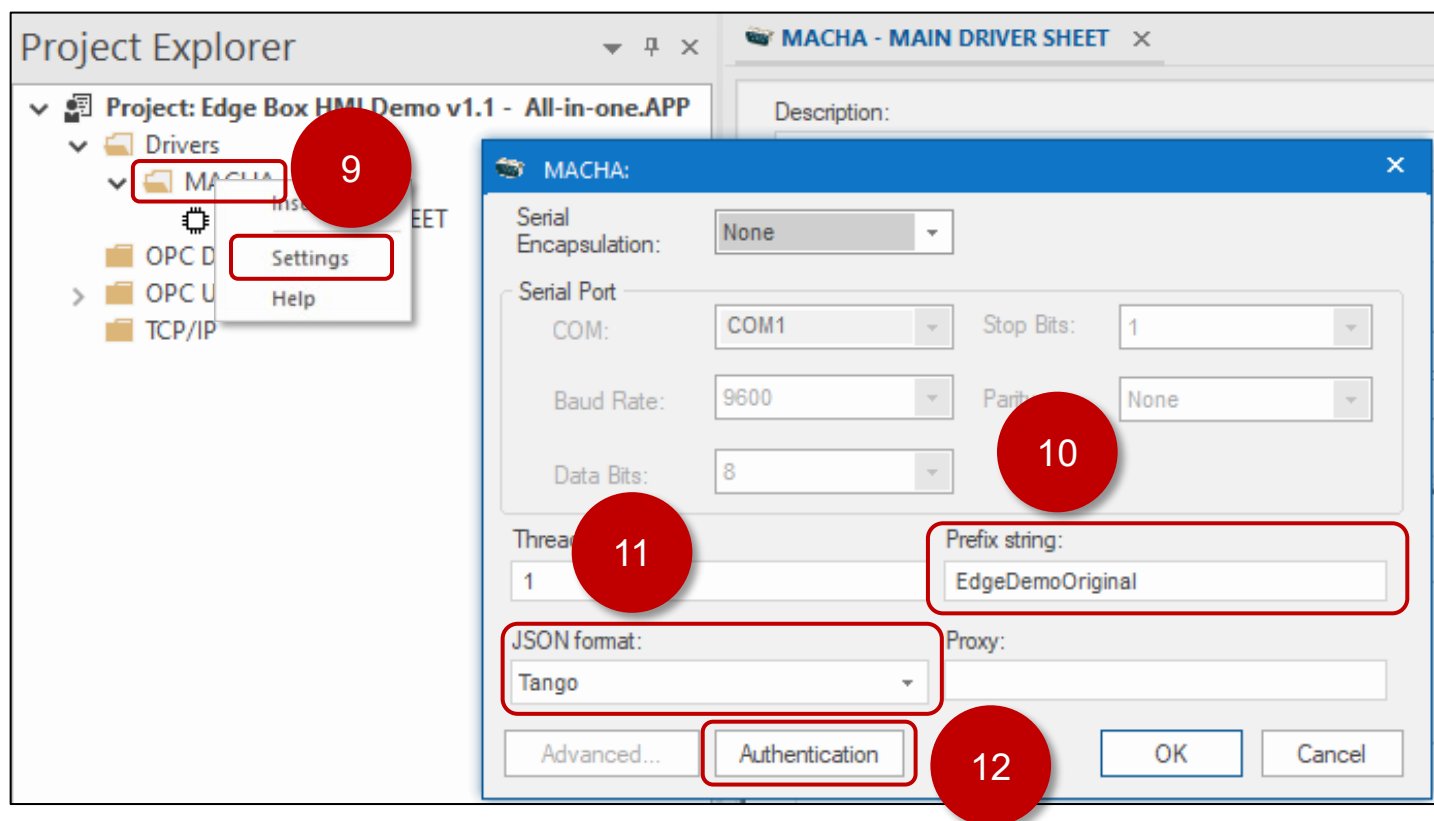
1. Launch a Web Browser on your PC and go to <https://curl.se/docs/caextract.html>
2. Download the “cacert.pem” file.
3. Rename the file as “macha.pem”.
4. Copy “macha.pem” to the driver directory. For example for a default installation C:\Program Files (x86)\Schneider Electric\EcoStruxure Machine SCADA Expert 2020\Redist\IoTView\Linux\arm-gnueabi-hf-2.13-6.0.17\drv



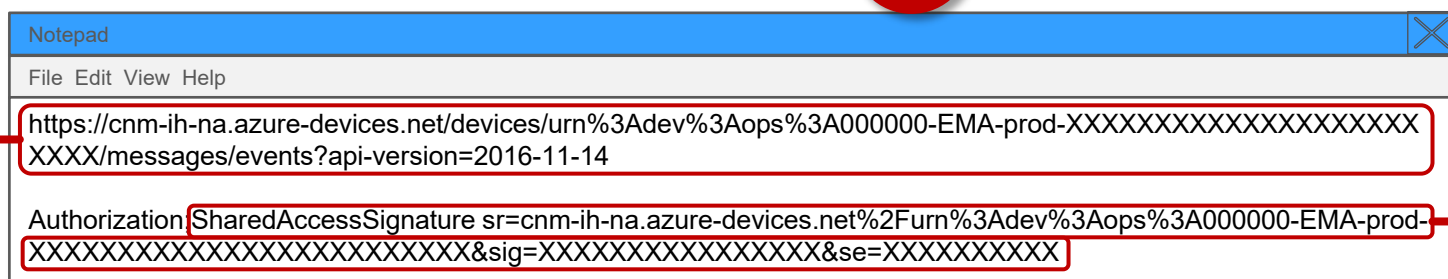
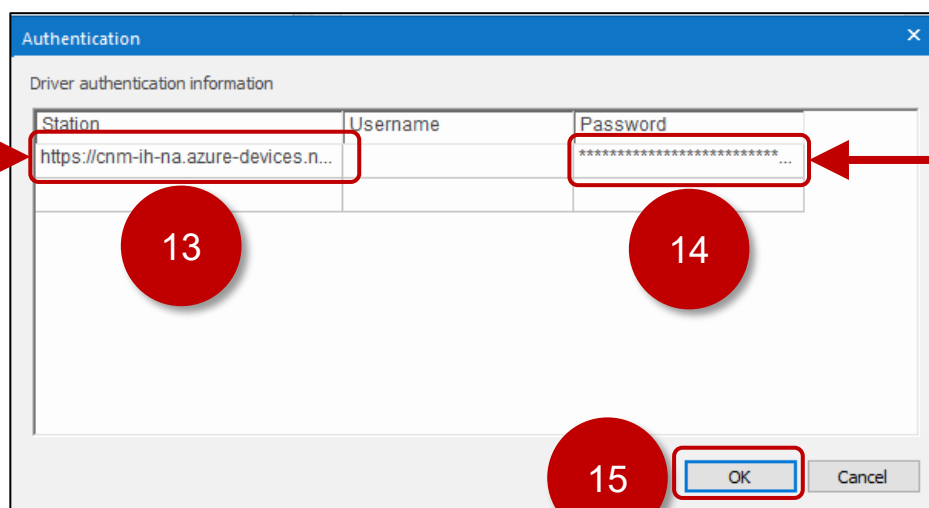
- Open the Edge Box HMI Demo v1.1 – EcoStruxure Machine Advisor.app project in EcoStruxure Machine SCADA Expert
- [Project Explorer] -> [Comm] tab -> [Drivers] -> [MACHA] -> [MAIN DRIVER SHEET]
- Copy the station address from notepad and overwrite the station address for rows 1 through 7 with the new Machine Station ID.
- Save the [MAIN DRIVER SHEET].



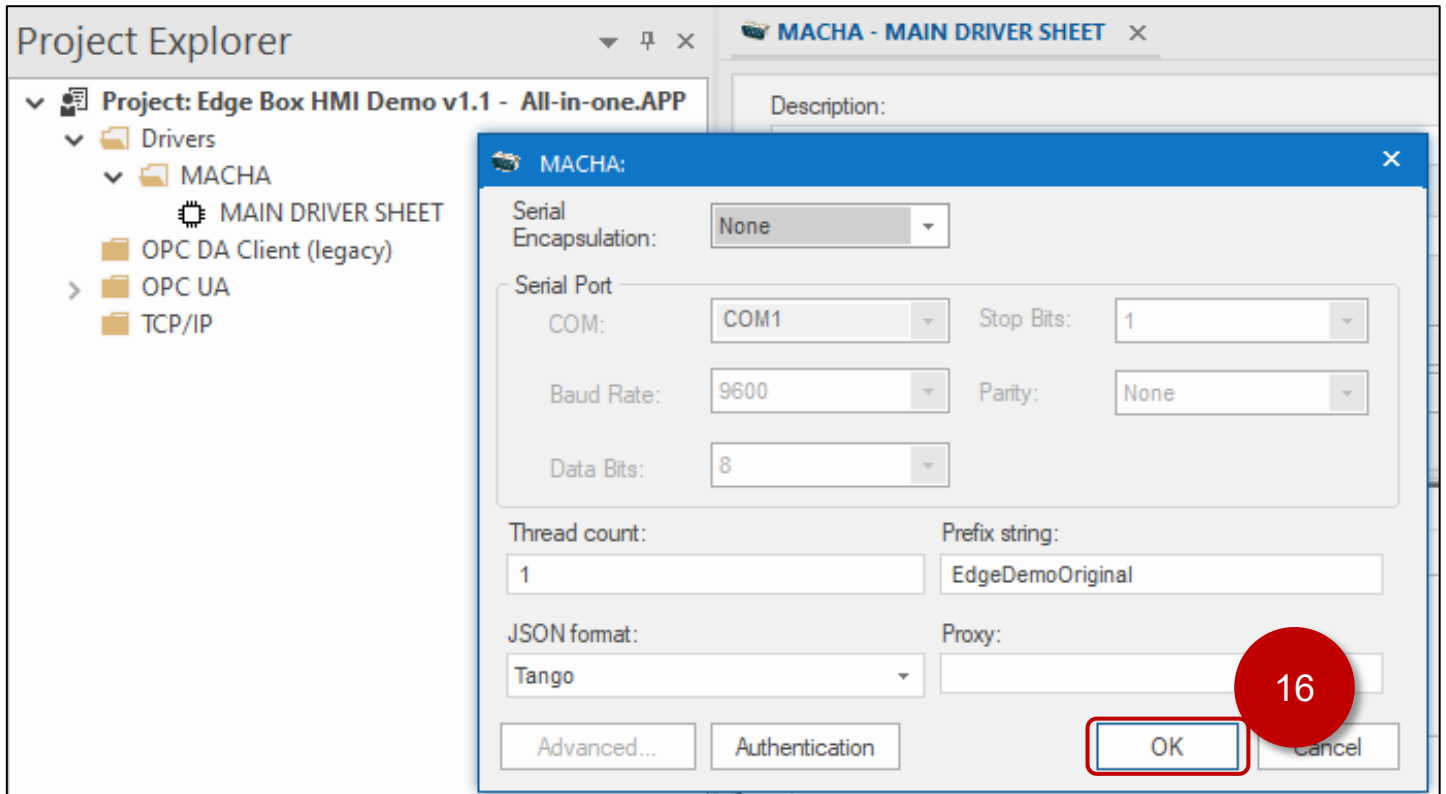
9. Right Click on [MACHA] and Select [Settings].
10. Set Prefix String: ANY, e.g. EdgeDemoOriginal
11. Select JSON Format: [Tango]
12. Click [Authentication]



13. Copy URL and overwrite Station field.
14. Copy Token (after "Authorization;") and overwrite the Password field.
15. Click [OK]

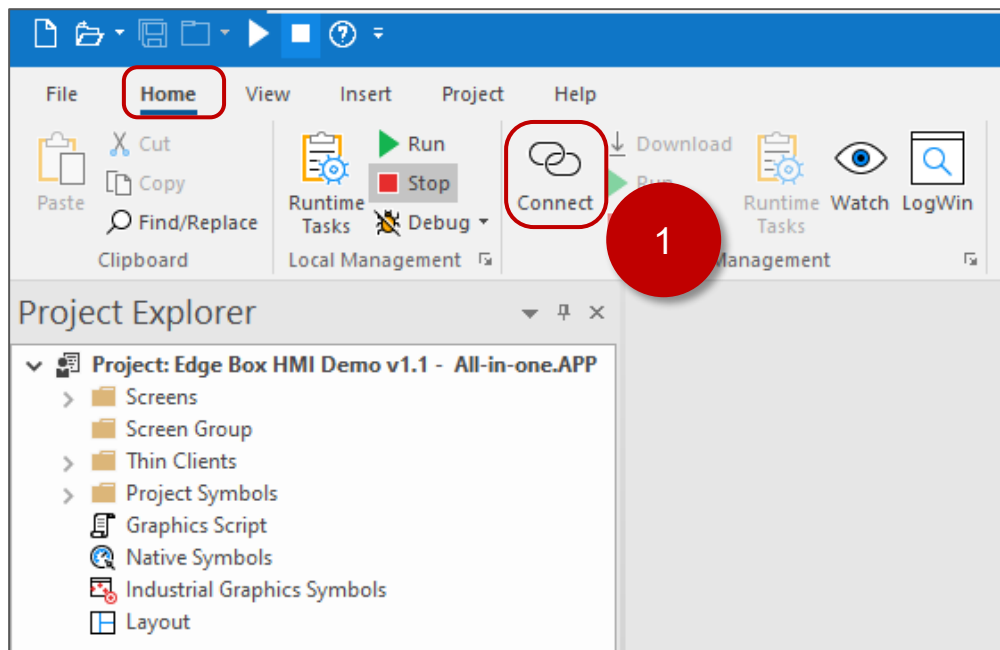


16. Click [OK] to close the MACHA driver settings.

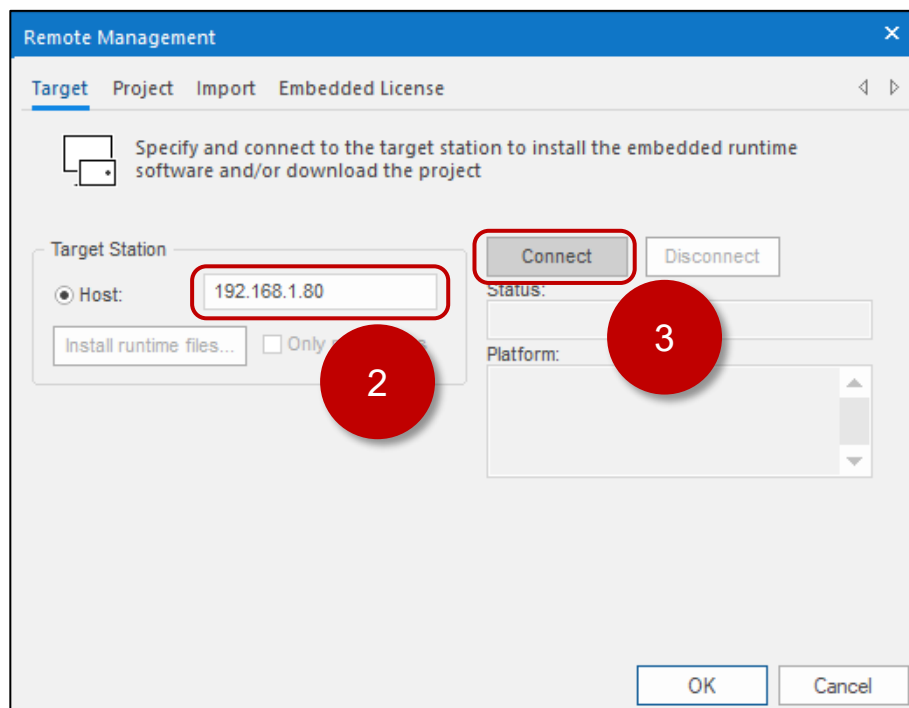


5. Transfer Runtime and Project Files

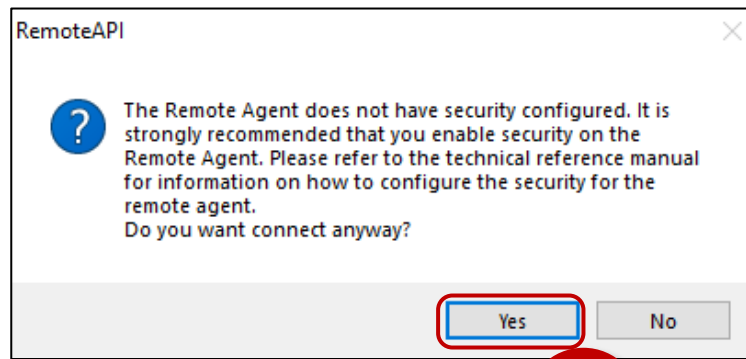
1. [Home] tab and Click [Connect] in Remote Management.



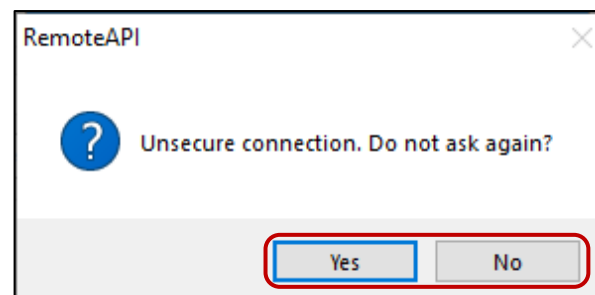
2. Set the IP Address of your Edge Box HMI e.g. 192.168.1.80
3. Click [Connect]



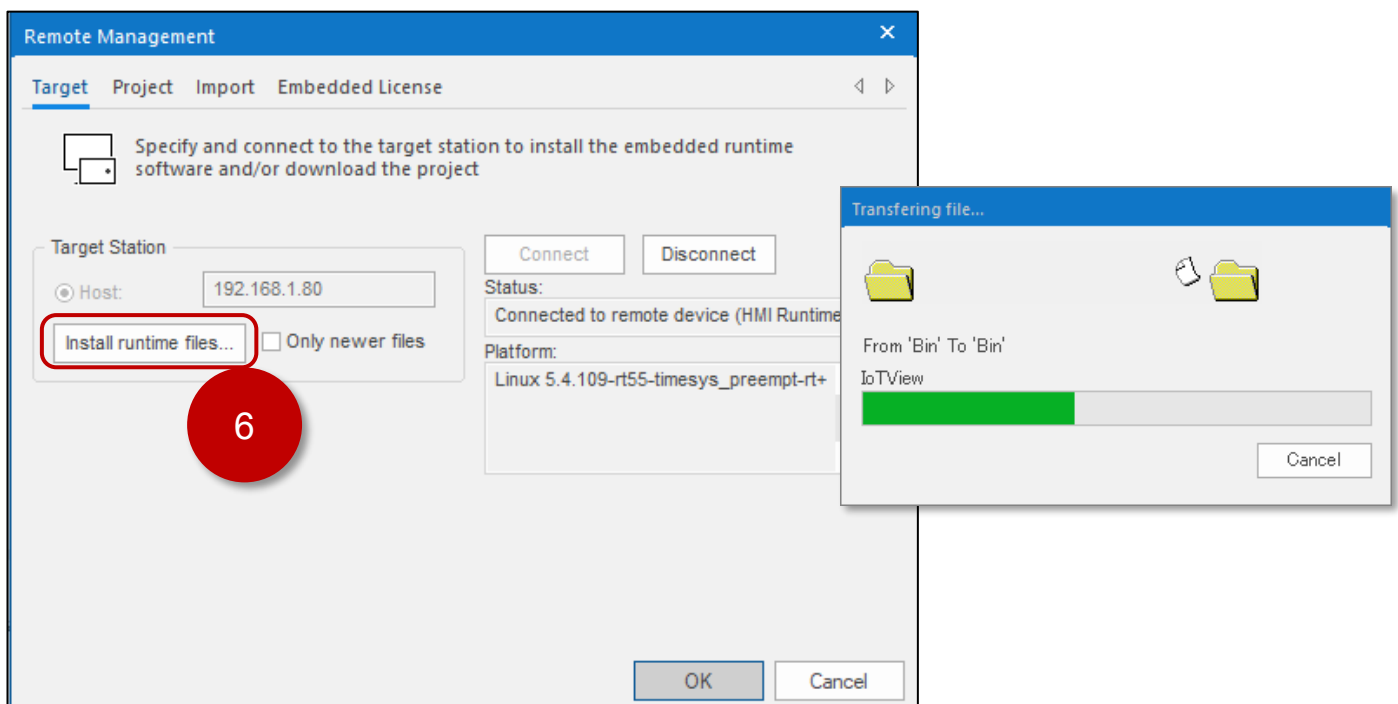
4. If prompted about Remote Agent, click [Yes]



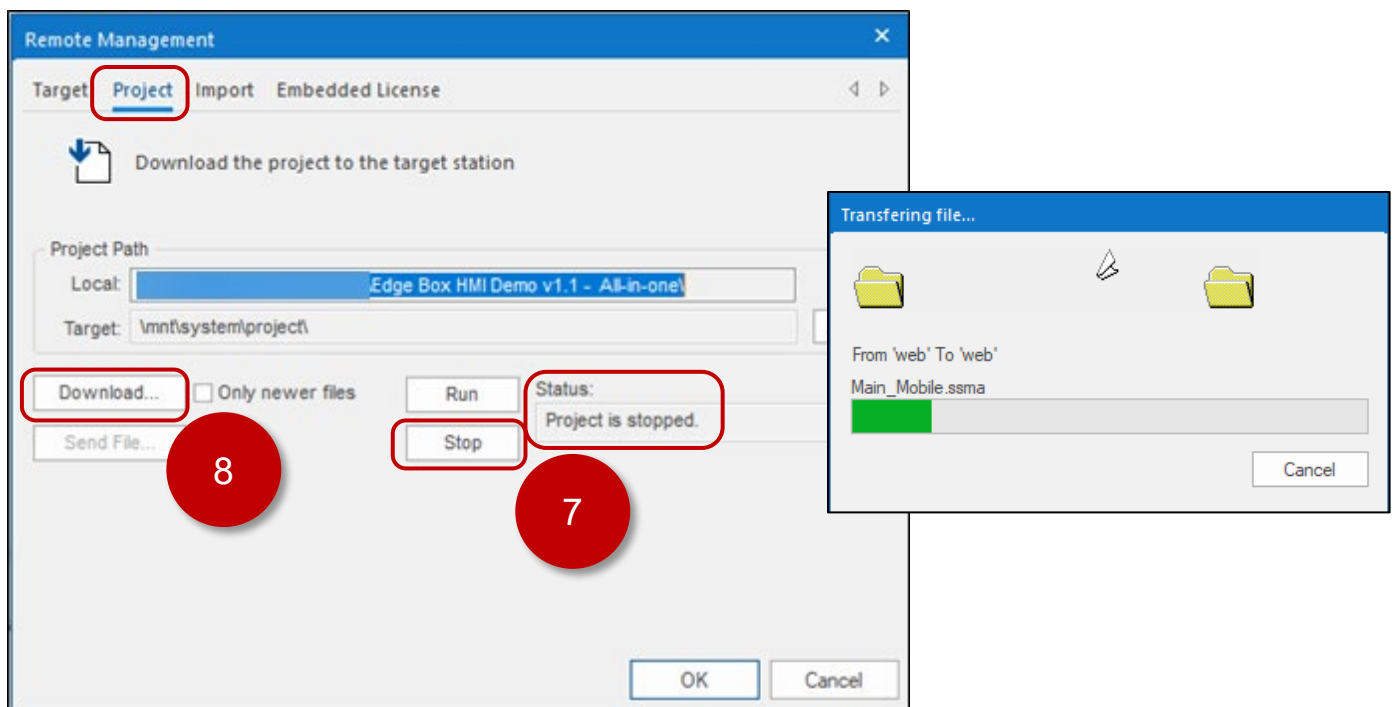
5. Answer the question by clicking [Yes] or [No] as appropriate.



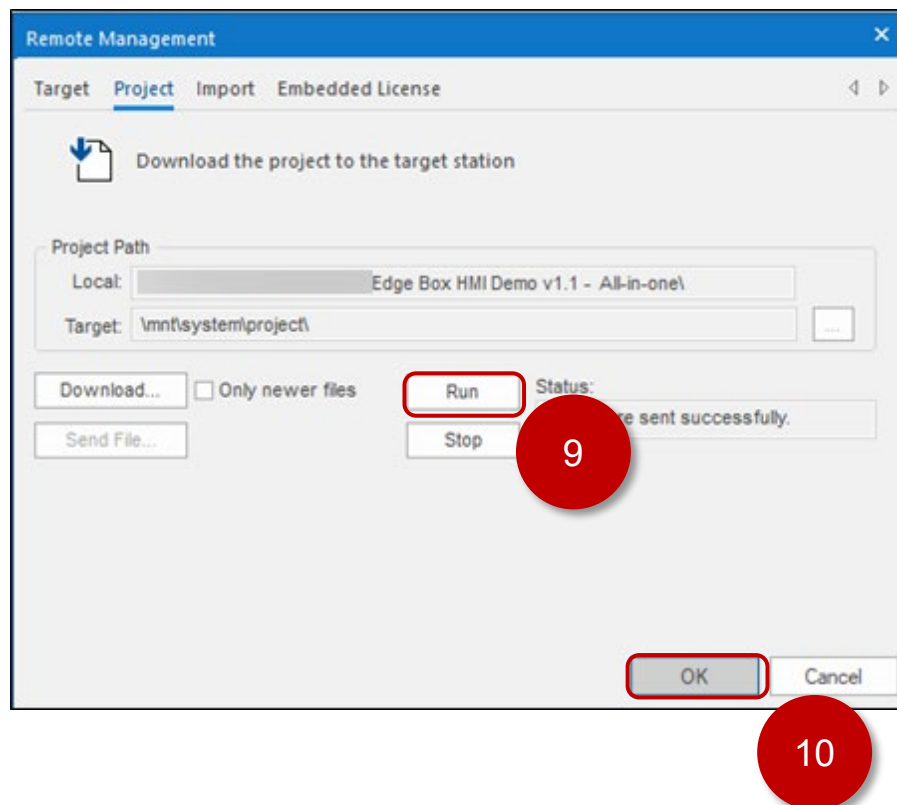
6. Click [Install Runtime Files]



7. [Project] tab, confirm that the Status is stopped. If running, click [Stop]
8. Click [Download]



9. Click [Run]
10. Click [OK]



6. Mobile Access

Mobile access is used for both local and remote viewing of Edge Box HMI. You can use either ETHERNET 1 or ETHERNET 2 as the IP address for mobile access.

There are a several mobile access URL options to view the Edge Box HMI.

- Mobile Access Generic Interface
- Mobile Access Direct to screen access
- Mobile Access Watch screen Access

Web Browser URL Examples for the Edge Box HMI Demo:

Link	Description
https://192.168.1.80/MA	Generic Interface login prompt
https://192.168.1.80/MA/#guestuser=1	Generic Interface auto login as Guest
https://192.168.1.80/MA/#user=Admin&password=Admin	Generic Interface auto login as Admin
https://192.168.1.80/MA/#screen=main_desktop	Direct to main_desktop screen login prompt
https://192.168.1.80/MA/#screen=main_desktop&guestuser=1	Direct to main_desktop screen auto login as Guest
https://192.168.1.80/MA/#screen=main_desktop&user=Admin&password=Admin	Direct to main_desktop screen auto login as Admin
https://192.168.1.80/MA/#screen=main_mobile	Direct to main_mobile screen login prompt
https://192.168.1.80/MA/#screen=main_mobile&guestuser=1	Direct to main_mobile screen auto login as Guest
https://192.168.1.80/MA/#screen=main_mobile&user=Admin&password=Admin	Direct to main_mobile screen auto login as Admin
https://192.168.1.80/MA/#watch=1	Watch screen login prompt Guest access denied
https://192.168.1.80/MA/#watch=1&guestuser=1	Watch screen auto login as Guest Guest access denied
https://192.168.1.80/MA/#watch=1&user=Admin&password=Admin	Watch screen auto login as Admin