RXi HMI

USER MANUAL

EMERSON

Contents

Warnings and Caution Notes as Used in this Publication

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Warning notices are used in this publication to emphasize that hazardous voltages, currents, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use.

In situations where inattention could cause either personal injury or damage to equipment, a Warning notice is used.

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Section 1: Introduction

The RXi HMI is an operator interface ready for local and machine visualization needs. Powered by Movicon.NExT WebHMI software, the RXi HMI offers intuitive 2D and 3D graphics, multi-touch gesture support, and historical trending. It supports a wide variety of OT protocols, OPC UA and MQTT for remote connectivity, and supports HTML5 for remote visualization. The RXi HMI is industrial environment ready with ATEX, UL Hazloc, Marine, and IP66 certifications. Web HMI project files can be configured and deployed to the RXi HMI using the Movicon.NExT configuration tool which can be installed on a separate computer or laptop."

1.1 Movicon Development Help

This documents centers on configuration of the RXi HMI hardware. For help with the Movicon WebHMI development environment, please consult the Movicon User Manual listed in the following section.

1.2 Related Documentation

Related Documentation	Document Number
RXi HMI User Manual	GFK-3231
RXi HMI Secure Deployment Guide	GFK-3232
RXi HMI Quick Start Guide	GFK-3233
Movicon.NExT User Manual	-
Industrial Security in SCADA Systems: IEC 62443-3-3 Certification	-

1.3 Revision History

Rev	Date	Description
A	Nov 2021	Initial Release

Section 2: Hardware Specification

2.1 RXi HMI

	Display Size	12"	15"	19"		24"
Display	Resolution	1280 x 800 WXGA	1920 x 1080 Full HD			
	Format	Widescreen (16:10)		Widescreen (16:9)		
	Orientation	Landscape				
	Reading Angle (°)	176 (H) / 176 (V)		170 (H) / 170 (V)	178 (H) / 178 (V)	
	Display Off-Color	Black				
	Contrast	1000:1		800:1	1000:1	5000:1
	Brightness (cd/m2)	400 (1000 with Outdoor SLR Screen)		450 (1000 with Outdoor SLR Screen)	350	300
	Colors	16.2 Million				
	MTBF Backlighting	50,000 h (at 25°C)				
	Backlight	LED, Dimmable via Software				
Processor	Chipset	AMD Embedded G-Series SOC				
	Chipset Drivers	AMD 2.16.12.341RL				
	Processor	GX-412GC				
	# of cores/TDP	4/15W				
	CPU frequency/L2 Cache	GX-412GC: 1.2GHz/2MB				
	GPU frequency	GX-412GC: 300MHz				
	AMD Graphics Driver	20.50.23.01L				
Memory	Capacity	4GB DDR3L (Soldered with ECC, -40°C ~ 85°C)				
Storage	Internal	64 MLC SSD (SATA Slim, -40°C ~ 85°C)				
	External Slot	1 x External Micro SD/ SDHC Card Slot (up to 32GB)				
Watchdog Timer	Timer Levels	255 timer levels, set up by software				
Operating Control	Method	Touch				
Touchscreen	Technology	Projected Capacitive Touch (PCT/PCAP)				
	Touch Sensor	Multi-touch (Ten-Point) Note: Unit's touchscreen only makes sound when connected to an external speaker. No cursor displays when touched.				

	Display Size	12"	15"	19"	24"
Interfaces	Port 1	4 x 10/100/1000 Base T Ethernet RJ45			
	Port 2	1 x RS-232 COM Port (5-Pin Connector, Isolated, use 24-16AWG (0.2-1.3mm²), strip-length 10mm) 1 x RS-485 COM Port (5-Pin Connector, Isolated, use 24-16AWG (0.2-1.3mm²), strip-length 10mm)			
	Port 3	2 x USB 3.0 (Type-A) 2 x USB 2.0 (Type-A)			
	Port 4	1 x DisplayPort			
	Port 5	1 x Mic In (Mono) (3.5mm Jack)			
	Port 6	1 x Line Out (Stereo) (3.5mm Jack)			
Status Indicators	Front Bezel Tri-color LED	Amber / Green / Red			
	On-board Buzzer	Yes (85dB sound level with 80mA mean current)			
Power-Supply	Voltage [V]	+24VDC ±10% (3-Pin Connector, Isolated, use 28-14AWG (0.2-1.5mm²) wire rated 90C, 1.7 in-lbs (0.19Nm) torque)			
Power Consumption	Maximum Wattage [W]	19 W		19 W	19 W	43 W
Protection-Class/Installation	Front-Side	IP66 & Type 4/4X (When Installed to a suitable Wall/Panel)			
	Back-Side	IP20/Open Type product for mounting in an ultimate enclosure Pollution Degree 2 environment			
Operating System	Installed Standard	Windows 10 IOT Enterprise LTSC			
Software Tools	Tool 1	Secure & Trusted Boot Capability			
	Tool 2	DHCP-Client, Web Browser (IE or Google Chrome), Java JRE Capability			
Secure & Trusted Boot	Item 1	On-Board TPM2.0			
Design	Housing	Aluminum Die Casting (Front)			
	Construction Type	Modular (Detachable Modules; Computer, Monitor, Touch Display, DIO)			
	Cooling	Natural Convection (Fanless Passive Cooling)			
Environmental	Operating Temperature	-20°C to +65°C			
	Storage Temperature	-30°C to +70°C			
	Operating Humidity	85% RH (non- condensing) @ 30°C			
	Operating Altitude	10000 ft. (3.000 m)			
	Vibration	1Grms / 5 ~ 500Hz (Random) / Operation IEC 60068-2-64 10G peak acceleration (11 msec. duration)/operation IEC 60068-2-27			
Mounting	Panel Cutout Dimensions (mm)	317 (W) 214.5 (H)		398 (W) 245.5 (H)	482 (W) 297 (H)	581 (W) 360 (H)
	VESA Mounting	75 x 75		100 x 100		
	Hardware Included	Mounting Clamps			
Physical Specification	Net Weight (kg)	3.8		5.1	6.9	9.0
	Dimensions (mm)	329.1(W) 226.8(H) 66(D)		410.2(W) 257.6(H) 65(D)	500(W) 315(H) 70(D)	600(W) 382(H) 71(D)

	Display Size	12"	15"	19"	24"
Certifications	Certifications	UL and cUL Information Technology Equipment (UL/CSA 62368-1) UL and cUL Class 1 Division 2: Programmable Controllers for Use in Hazardous Locations (UL/CSA 61010-2-201, UL 121201, CSA C22.2 No. 213) IECEx & ATEX Zone 2/22 Hazardous Locations(IEC/EN 60079-0, IEC/EN 60079-7, IEC/EN 60079-31) IECEE CB Scheme (IEC 61010-2-201) UL TYPE 4 & 4X, IP66 (ANSI/IEC 60529) Marine: DNV, ABS, BV, LR			

2.2 RXi HMI Motherboard Specifications

Item	Description
Board Size	170mm x 113mm
CPU Support	AMD® Embedded G-Series AMD® GX-412GC, Quad-Core, 2M Cache, 1.2GHz, 15W
Memory Support	4GB DDR3L (Soldered with ECC, -40°C ~ 85°C) Supports Single Channel DDR3 1066/1333MHz
Graphics	AMD Radeon™ R3E GPU DirectX® 11.2, OpenGL 4.3, OpenCL™ 1.2 graphics support 1 x DP++ 1 x LVDS DP++: resolution up to 4096x2160 @ 30Hz LVDS: dual channel 24-bit, resolution up to 1920x1200 @ 60Hz
BIOS	AMI SPI 64Mbit
Storage	1 x Micro SD 1 x SATA 3.0 (7+15pin)
Ethernet	2 x Intel® I210IT, -40 to 105°C PCIe (10/100/1000Mbps)
Outside I/O	2 x USB 3.0 1 x RS-232 1 x RS-485 1 x Line-out 1 x Mic-in 2 x GbE (RJ-45) 1 x DP++ 1 x Power Button
Internal I/O	1 x LVDS LCD Panel Connector 1 x AIO/DIO 1x30pin Connector (JAE TX24-30R-10ST-H1E)
Battery	CR2032 Coin Cell
Audio	Codec:92HD73C
Expansion	1 x Mini PCIe (PCIe/USB 2.0) 1 x M.2 E key 2230 (PCIe/USB 2.0)
Security	TPM2.0
Watchdog Timer	System Reset Programmable via Software from 1 to 255 Seconds/Minutes
Temperature	Operating: -30 to 85 °C Storage: -30 to 85 °C
Humidity	Operating: 10 to 90% RH Storage: 10 to 90% RH
OS Support	Windows 10 IoT Enterprise 2019 LTSC (x64)

Section 3: RXi HMI Windows Activation

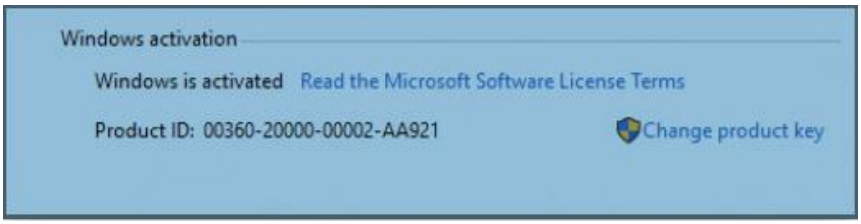
The preloaded Windows 10 IOT Enterprise image on RXi HMI is activated by Default. The product key is embedded with the Windows.

By default, the user must enable each device for activation.

Each device is subject to one of three potential states :

Activated State: If the device is connected to the Internet, the device will automatically activate over the Internet (Figure 1).

Figure 1: Activated State



Deferred Activation State: If the device is not connected to the Internet, it will remain in a **deferred activation state** (Figure 2).

Figure 2: Deferred Activation state

Note: The Windows Activation dialog box will display **Connect to the Internet to Activate Windows,** but it may not display the **Activate Windows** icon nor reduce functionality.

Not Activated State: If the device connects to the Internet and the activation attempt fails due to an invalid licensing key or one that has exceeded its activation allotment, it will enter a Not Activated state.

Figure 3: Not Activated State

After a device has been activated, it will remain activated unless a significant change triggers a need to reactivate the device, such as a motherboard replacement or completely reimaging the device.

Section 4: Movicon WebHMI Configuration

4.1 Movicon WebHMI Configuration

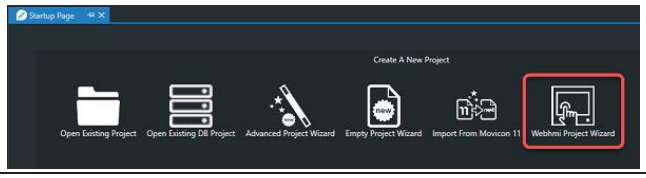
4.1.1 Deploying Movicon WebHMI projects in RXi HMI

This topic shows you how to transfer the project to an RXi HMI.

The steps to deploy the project correctly are:

1. Launch the Movicon.NExT 4.1 editors from the desktop shortcut or the Start Menu.
2. Create a new Movicon project by choosing the **WebHMI Project Wizard** model from the Startup Page. The user can open the already created project by clicking **Open Existing Project**.

Figure 4: WebHMI Project Wizard

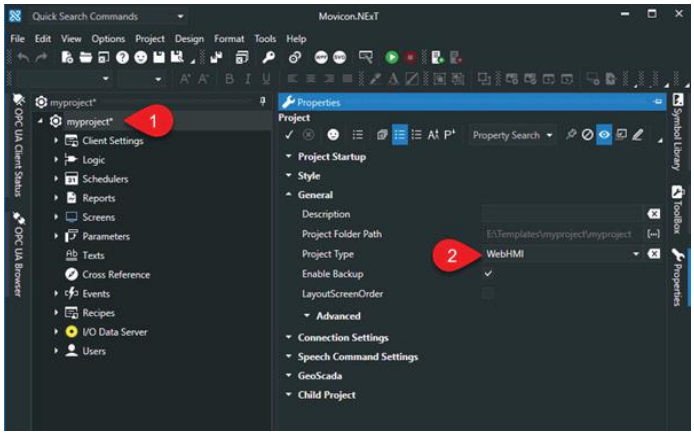


3. Add required screens, graphical objects, tags, and configure drivers.

   Note: Check the Movicon NExT 4.1 User Manual or online/local help for more details about the configuration of Movicon WebHMI Project.

4. The **Project Type** property is one of the project properties that is used to set the project as a **WebHMI** type. When setting the project as a WebHMI, the Project Explorer, Toolbox and Animation Explorer, and Command windows will only show the resources, animation objects, and commands that are supported while visualizing and using Web Client WebHMI.

Figure 5: Properties



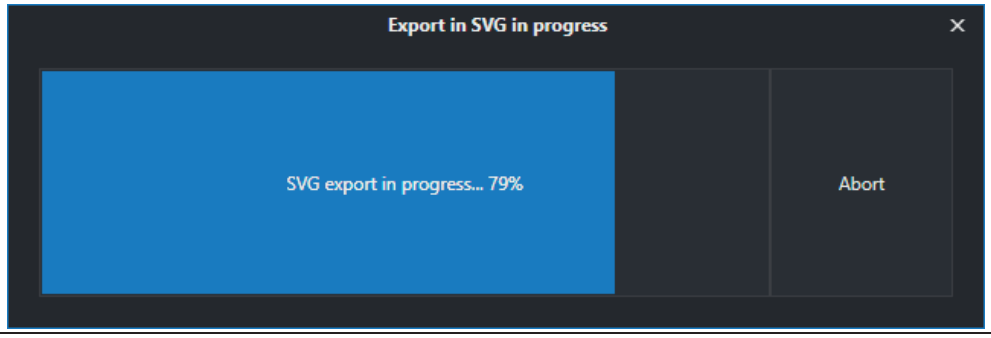
This property setting is particularly useful when:

- planning to develop a project that includes only those functions supported by WebHMI,
- needing to verify the compatibility of a previously developed project with WebHMI visualization. Any objects and symbols used in the project and not supported by WebHMI will be highlighted as shown in Figure 6.

Figure 6: Datalogger

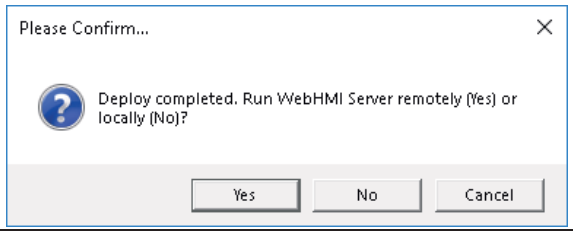
5. Select the command from the **Options -> Create WebHMI (SVG/HTML5)** menu from the project's toolbar that starts the project's export to SVG as shown below:

Figure 7: SVG



6. Once the export process has terminated, the user will be prompted to confirm whether or not to deploy and run the Web Server and Project on remote HMI as shown in Figure 8. Select **Yes** and the Deploy Project window will display.

Figure 8: Run Server Remotely

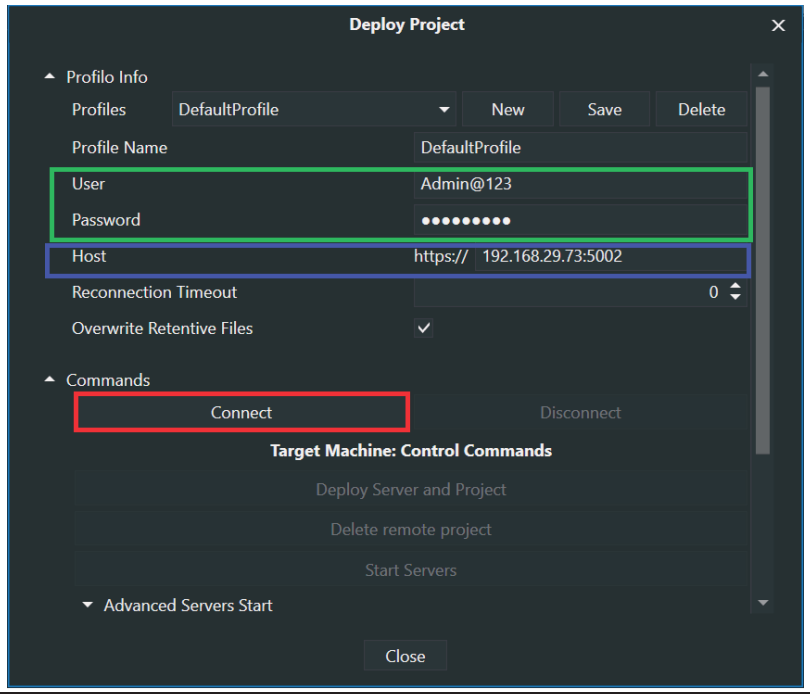


7. The Deploy Project window allows you to deploy the project on the RXi HMI along with the I/O Data Server and Web Server which are needed to run the WebHMI locally on the HMI. Enter **User** and **Password** as shown in green color. Provide the **IP Address of the RXi HMI** and port as **5002 <IP Address of RXi HMI:5002>** as shown in the blue color box. Finally, click on **Connect Commands** as shown in the red color box of Figure 9.

Check the Deploy Project Window section for a detailed view of the different Parameters.

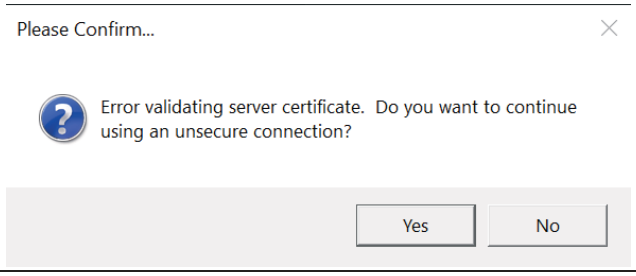
Note: The default user and password are **Admin@123**

Figure 9: Deploy Project



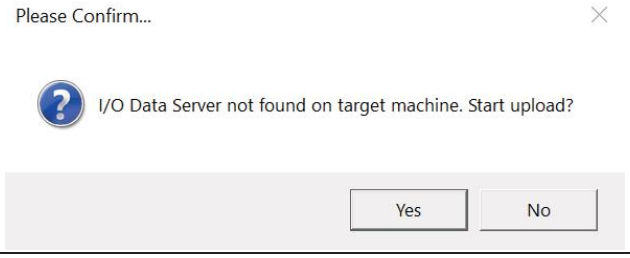
8. After clicking on **Connect**, the application will prompt for server certificate information. Click on **Yes** to continue with an unsecured connection. The user needs to create a self-signed certificate. The steps to create a self-signed certificate are in Section 4.1.4, *Self-Signed Certificate Generation* Steps.

Figure 10: Error Validation



9. The user will be prompted to deploy the I/O Data Server if not found on the RXi HMI as shown below. Click **Yes** to start uploading the I/O Data Server to RXi HMI.

Figure 11: IO Data Server Upload



10. The user will be prompted to deploy the WebHMI Server if not found on the RXi HMI as shown below. Click **Yes** to start uploading the WebHMI Server to RXi HMI.

Figure 12: WebHMI Server Upload

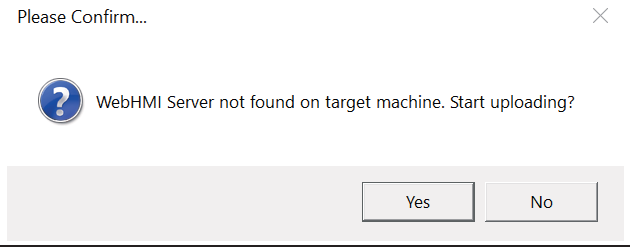
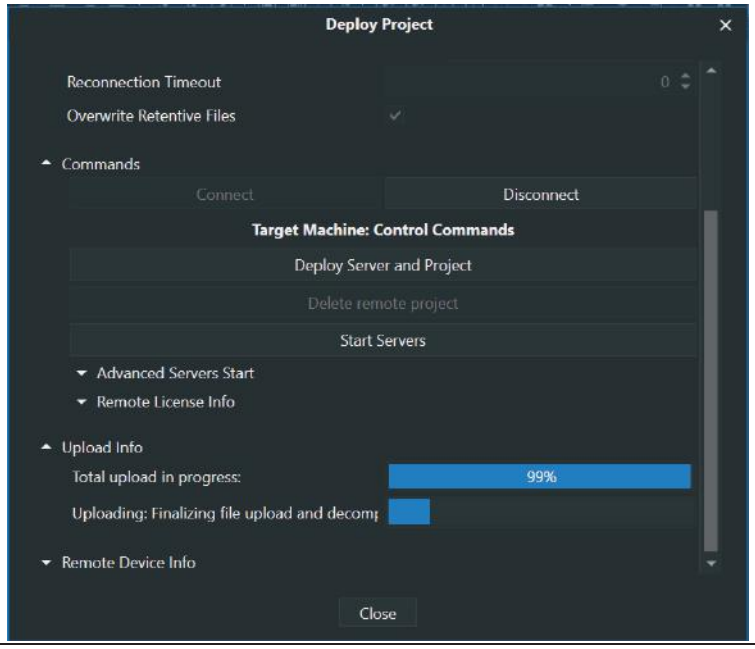
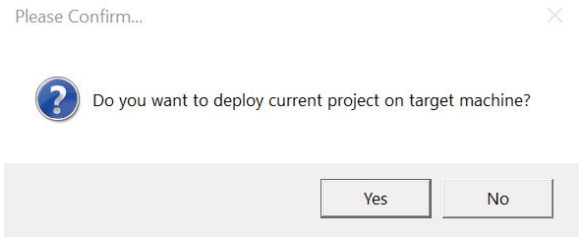


Figure 13: Deploy Project



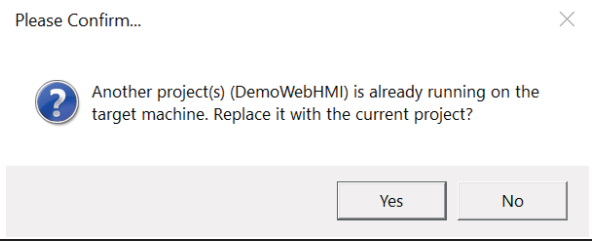
11. The user will be prompted to deploy the current project as shown below. Click **Yes** to start deploying the current project to RXi HMI.

Figure 14: Deploy Current Project on Target Machine



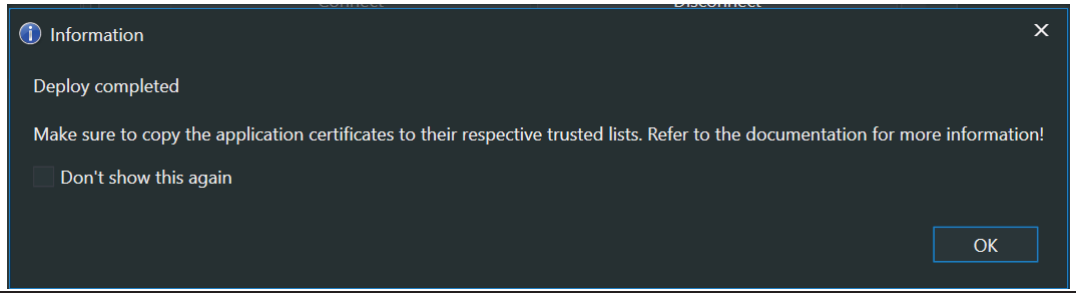
Note : If the project is already deployed and the user is trying to download a different project, then the user will be prompted to replace the current project as shown in Figure 15. It is always recommended to select **Yes.**

Figure 15: Replace Current Project



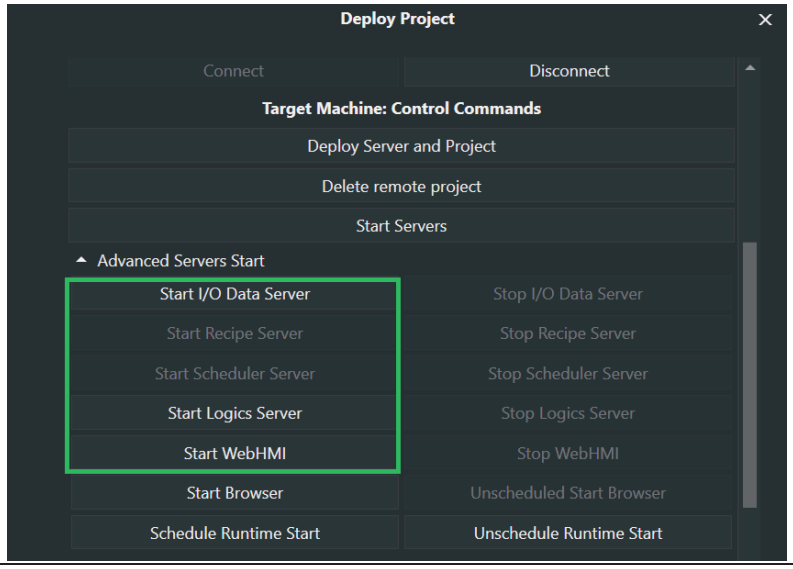
12. Once the project deployed is completed the user will be prompted with the below dialog. Click **OK** to close the pop-up dialog.

Figure 16: Deployment Completed



13. Start all the enabled servers (Figure 17).

Figure 17: Start Servers

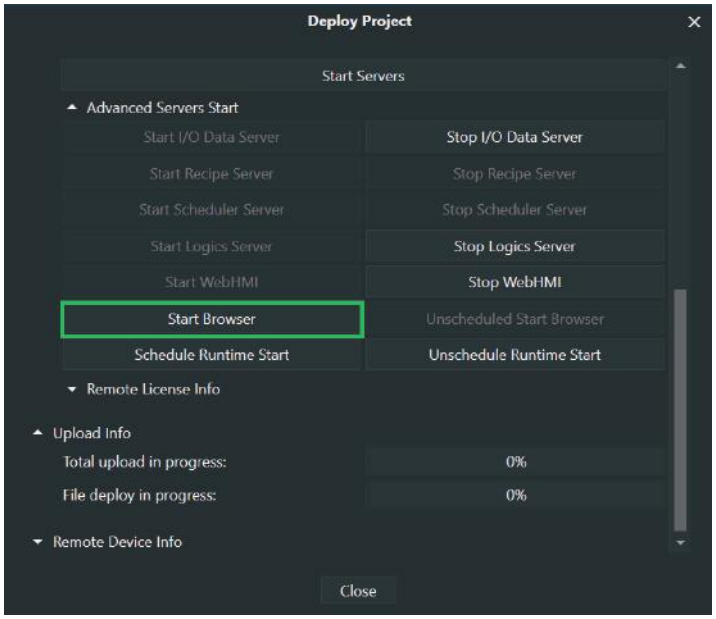


14. The Movicon WebHMI project can be opened as below on the RXi HMI. The project is deployed by the integrated Web Server on ports 5000 (HTTP) and 5001 (HTTPS). The default configuration requires that the request received on port 5000 be automatically redirected to port 5001.

Start Browser

To open a Google Chrome browser with a deployed project, the user needs to click on the **Start Browser** command. This will become the default operation on launch.

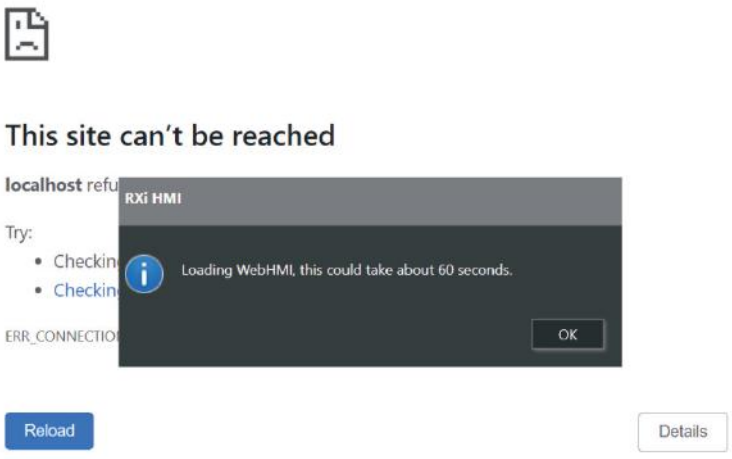
Figure 18: Start Browser



Note: The **Start Browser** command will schedule the Google chrome browser to start automatically on every reboot with a deployed project.

When the user restarts the RXi HMI after deploying the WebHMI, a dialog will appear with the message **Loading WebHMI, this could take about 60 seconds**, as shown in Figure 19. The user can click on the **OK** button to close this dialog, or it will be closed automatically after 60 seconds.

Figure 19: Loading WebHMI

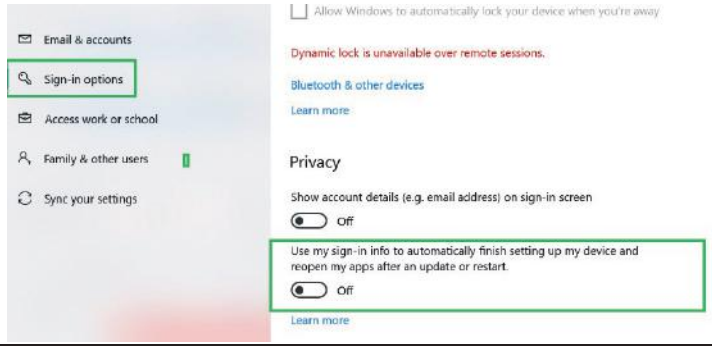


Disable Automatic Sign-In

If the automatic sign-in feature is not disabled, the scheduled browser will open two instances of Chrome on every reboot. To disable the feature, use the following steps:

Go to *Settings* > *Accounts* > *Sign-in options* > *Privacy* > *Use my sign-in info to automatically finish setting up my device and reopen my apps after an update or restart*. Set this option to **off** as shown in Figure 20.

Figure 20: Sign-In Options



Opening Browser Manually on RXi HMI

If the user elects to open the Movicon WebHMI screen manually by using the Google chrome browser with the addresses below, then Google chrome browser will not automatically start on every reboot with deployed project.

The following addresses can also be used by the web browser:

Example: https://192.168.29.73:5001

https://localhost:5001

It is also possible to open a different page from the Main page defined in the project by using the following syntax:

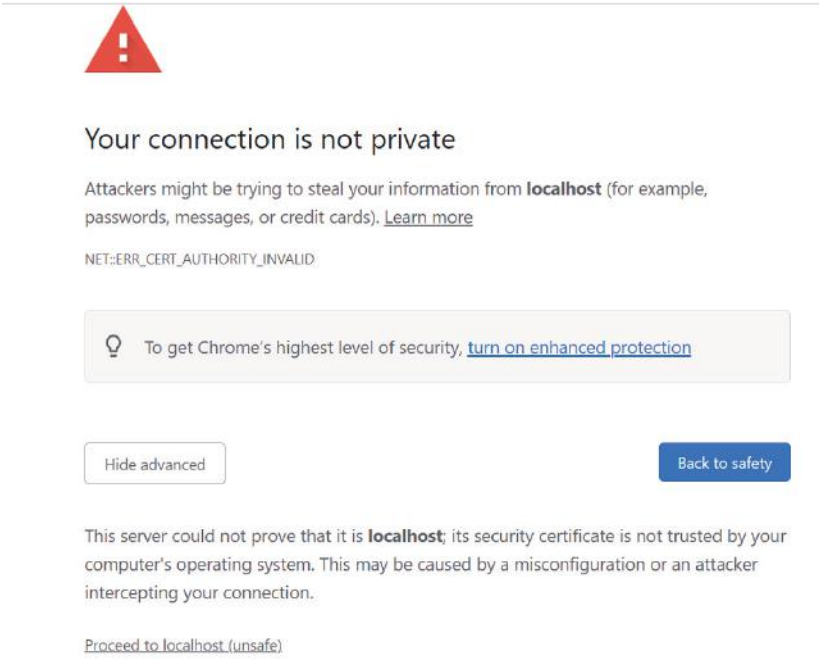
HTTP://<WebServer_IP_Address>:5000/?page=<ScreenName>

where **<ScreenName>** is the name of the Screen without extension.

Example: https://192.168.10.10:5001/?page=Screen1

Note: While opening the Movicon WebHMI Project using chrome browser the user will be prompted with a certificate that is not trusted as shown below. This is shown when the valid certificate is not installed. The user needs to click on Proceed to **<IP address of RXi HMI or localhost> (unsafe)** to start loading the Movicon WebHMI.

Figure 21: Untrusted Certificate



The user needs to create a self-signed certificate. The steps are available in Section 4.1.4, *Self-Signed Certificate Generation Steps*.

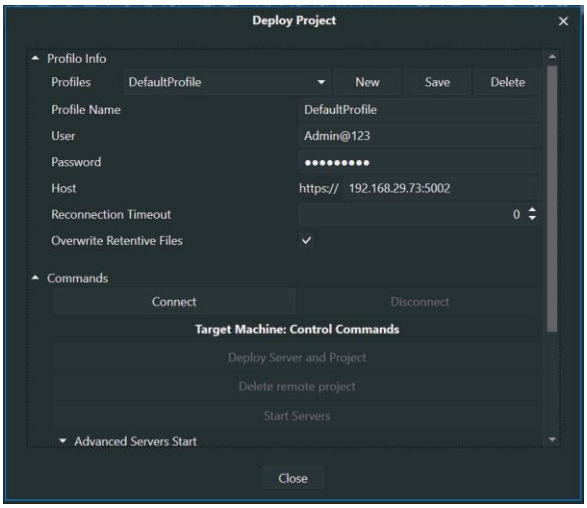
15. The Movicon WebHMI project can also be launched directly by Clicking on the **MoviconWeb HMI** icon on the desktop to open the webHMI Project. In this scenario chrome browser opens the Movicon WebHMI project in full-screen mode.

Figure 22: MoviconWeb HMI Icon

4.1.2 Deploy Project Window

The Deploy Project window allows the user to deploy the project on the HMI along with the I/O Data Server and Web Server which are needed to run the WebHMI locally on the HMI.

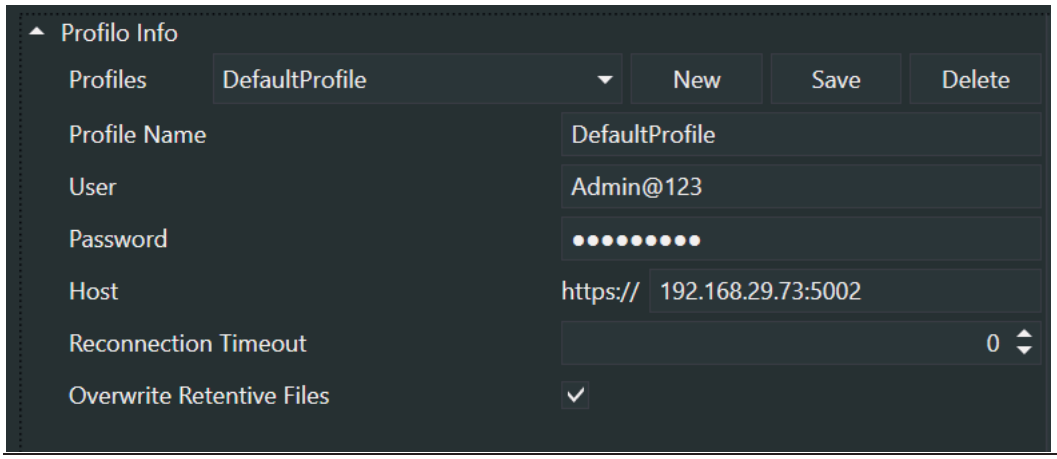
Figure 23: Deploy Project Window



4.1.3 Profilo Info

This section demonstrates how to define different connection profiles, such as for Deploy Servers of different devices.

Figure 24: Profilo Info



Profile name: The profile name is a unique identifier used by the developer to distinguish the various profiles.

User: The username is used to connect to the RXi HMI's Deploy Server.

Password: The password is used to connect to the RXi HMI's Deploy Server.

Host: The RXi HMI's IP address or hostname, including the Deploy Server port (E.g:192.168.0.74:5002)

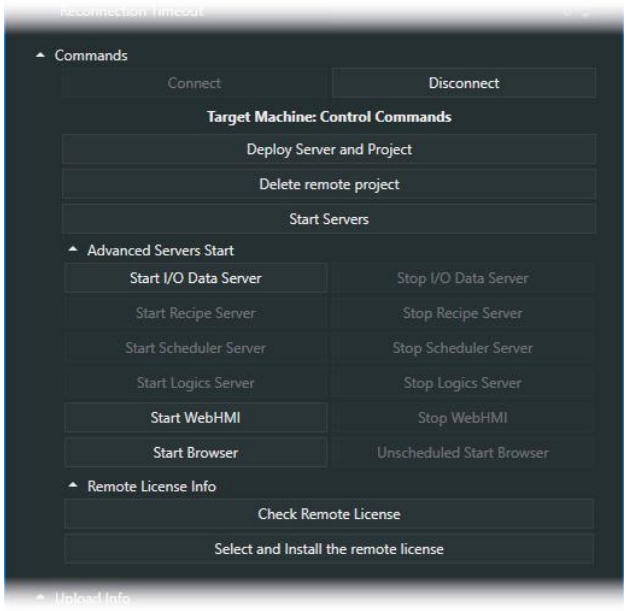
Overwrite Retentive Files: The retentive data in the device will be overwritten with those in the project during the project deployment phase. The retentive files are located in the project folders:

1. ...\UFUAServer\Alarms
2. ...\UFUAServer\Tags
3. ...\UFUAServer\EventLog
4. ...\UFUAServer\Historian
5. ...\UFUAServer\DataLogger

Commands

From this section, it is possible to manage the connection to the Deploy Server, control the Runtime components, and manage the license on the remote device.

Figure 25: Commands



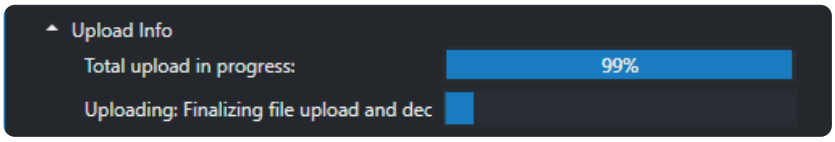
- **Connect/Disconnect:** this allows you to connect to or disconnect from the RXi HMI's Deploy Server.
- **Deploy Project and Server:** deploys the Project, I/O Data Server, and WebHMI's Web Server on the RXi HMI.
- **Cancel Remote Project:** this cancels the project on the RXi HMI.
- **Server Startup:** Starts all the services on the RXi HMI.
- **Advanced Server Startup**: allows the execution of each Runtime component to be started up or stopped.
- Remote License Info > **Check Remote License:** displays the RXi HMI's active license options and Site Code
- Remote License Info > **Install Remote License:** this allows the software license to be installed on the remote HMI.

Note: When first connecting to the Target HMI and after the self-signed certificate has been accepted, you will be asked to download the I/O Data Server, the WebHMI's Web Server, and the project. If they are already present on the HMI, you will be asked if you wish to update them.

Upload Info

This section reports the progress of the transfer in progress.

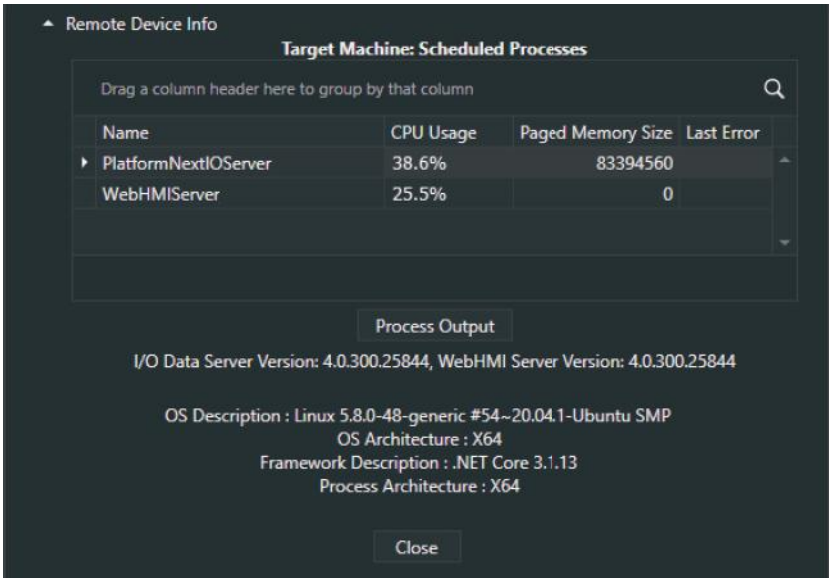
Figure 26: Upload Info



Remote Device Info

This section shows the information on the remote device's processes and operating system.

Figure 27: Remote Device Info



- **Scheduled Processes:** shows the process running on the remote HMI and CPU and RAM usage.
- **Process Output**: reports the actual Syslog file contents on the remote device.
- **OS Description:** shows the versions of the installed Runtime components and information on the HMI's operating system.

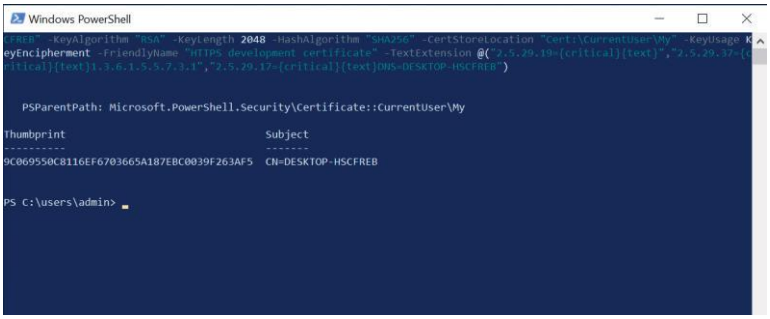
4.1.4 Self-Signed Certificate Generation Steps

1. Open a PowerShell window in administrator mode on the RXi HMI device and run the following command:

New-SelfSignedCertificate -NotBefore (Get-Date) -NotAfter (Get-Date).AddYears(1) -Subject "DESKTOP-HSCFREB" -KeyAlgorithm "RSA" -KeyLength 2048 -HashAlgorithm "SHA256" -CertStoreLocation "Cert:\CurrentUser\My" -KeyUsage KeyEncipherment -FriendlyName "HTTPS development certificate" -.TextExtension @("2.5.29.19={critical}{text}","2.5.29.37={critical}{text}1.3.6.1.5.5.7.3.1","2.5.29.17={critical}{text}DNS=DESKTOP-HSCFREB")

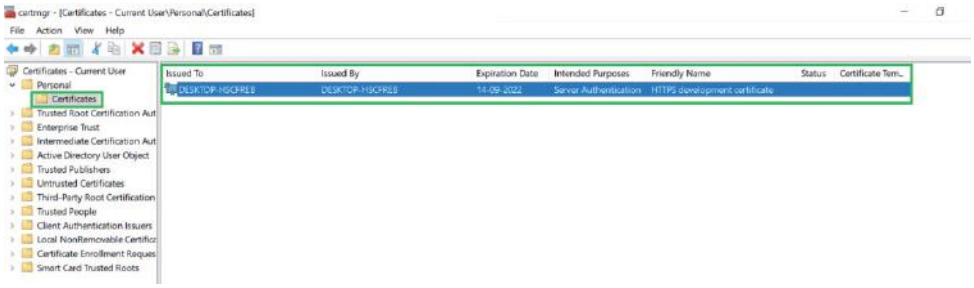
Note: Make sure to change the Subject and DNS from DESKTOP-HSCFREB to your Machine Name as highlighted. Be sure to point the web browser to `https://<Machine-name>:5001` once the machine name has been changed. It is advised to generate the certificate for **localhost.**

Figure 28: Windows Powershell



1. Press the (Windows) Key + R and type **certmgr.msc**
2. Find the certificate under Personal/Certificates. The **Issued To** field should be DESKTOP-HSCFREB and the **Friendly Name** should be HTTPS development certificate.

Figure 29: Issued To Field



3. Right-click on the DESKTOP-HSCFREB certificate and choose **Copy**.
4. Select the Trusted Root Certificate Authorities -> Certificates and right-click paste as shown in Figure 1. You will be prompted with a security warning as shown in Figure 30.

Figure 30: Security Warning

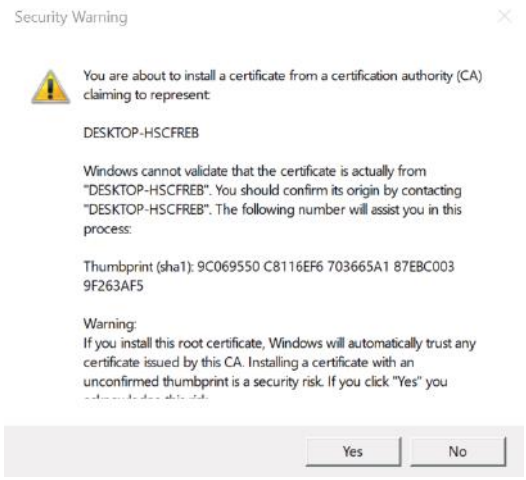
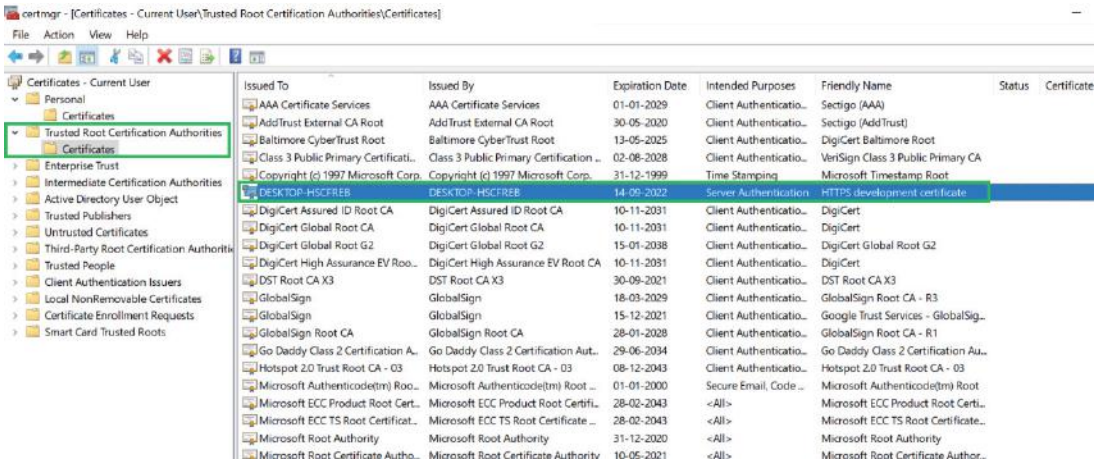
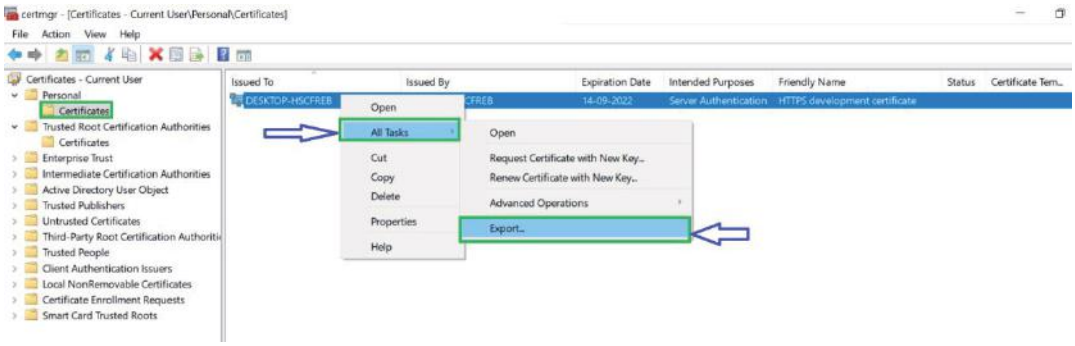


Figure 31: Trusted Root Certificate



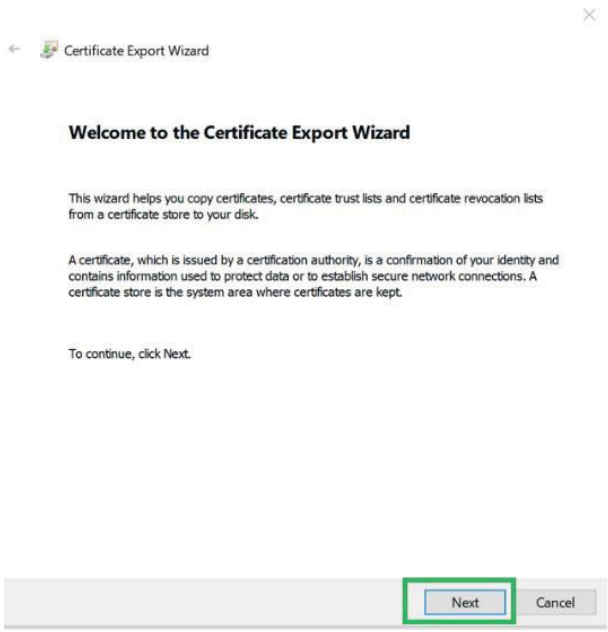
5. Follow the screenshots below to export the certificate into a *.pfx using the export wizard.

Figure 32: Export Wizard



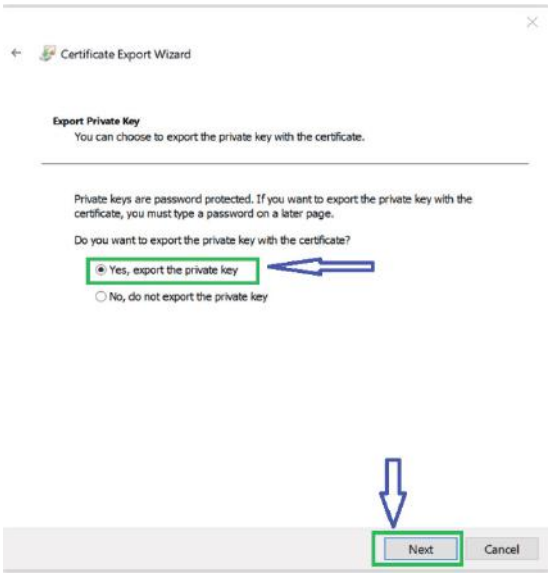
6. Follow the Export Wizard prompts.

Figure 33: Certificate Export Wizard



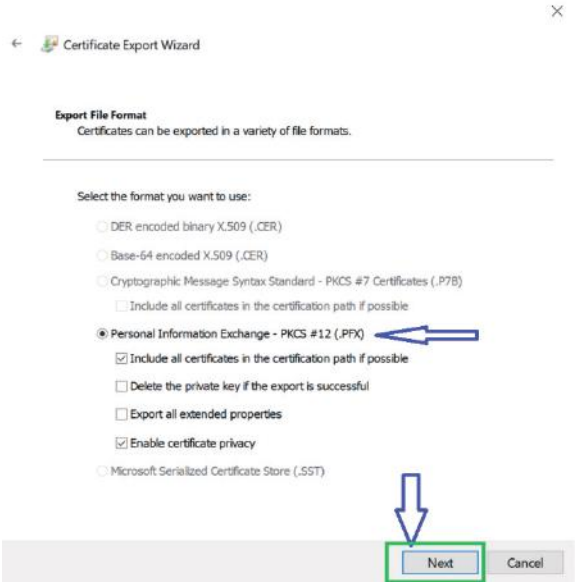
7. Export the Private Key.

Figure 34: Export Key



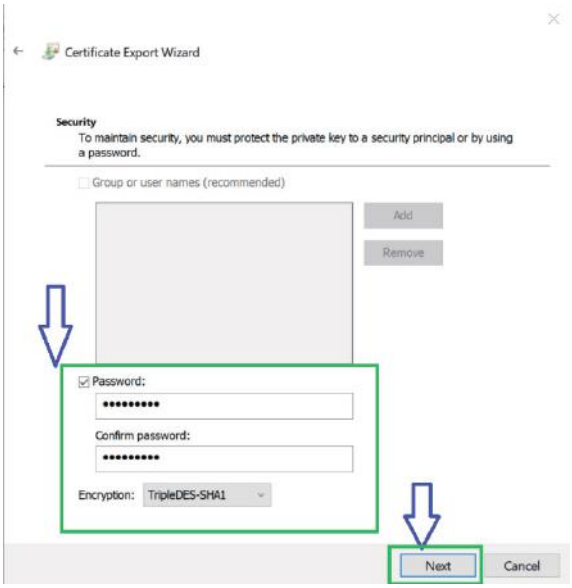
8. Select **Personal Information Exchange.**

Figure 35: Certificate Export Wizard



9. Create and confirm the new password.

Figure 36: Credentials



10. Browse for the Personal Information Exchange File (PFX). The file path is Users*Public**Documentation**Progea*

Figure 37: .PFX File

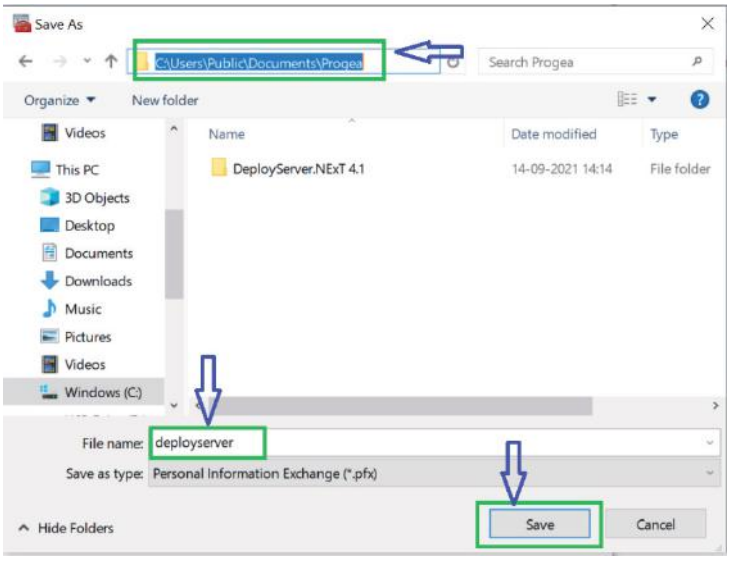
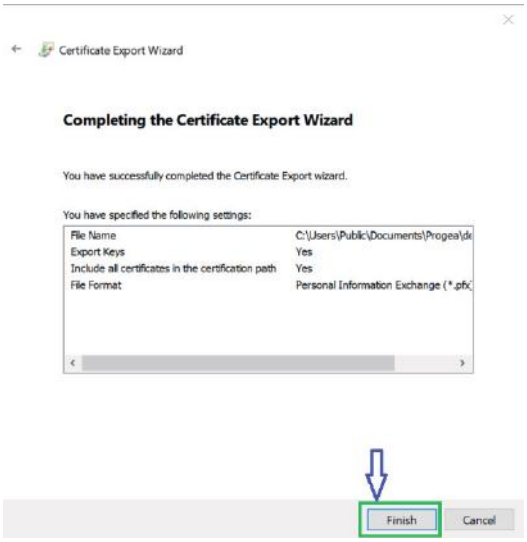


Figure 38: Certificate Export Wizard



16. Browse to the Path "*C:\Program Files\Progea\Movicon 4.1\DeployServer-Files*" and modify the appsettings.json file. Add Kestrel section as seen in Figure 39

Note: Browser to the path C:\Users\Public\Documents\Progea\DeployServer.NExT 4.1\WebHMIServer and also update appsettings.json file with the same information as done in Step 16.

Figure 39: Add the Kestrel Section

```
"Kestrel": {
  "EndpointDefaults": {
   "Protocols": "Http1"
  },
  "Certificates": {
     "Default": {
          "Path": "C:\\Users\\Progea\\Documents\\deployServer.pfx",
          "Password": "Admin@123"
     }
  }
}
```

Note: In these parts, you need to change the path and the password with the data that you have used for export the certificate.

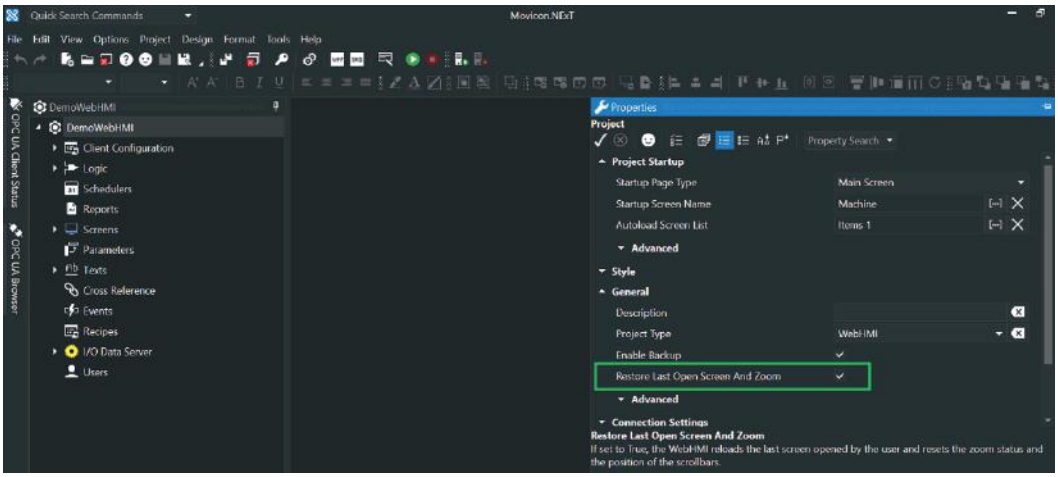
17. Restart the RXi HMI device.

Note: In this case locally you can connect without any warnings about the certificate. If you want to connect also using a remote computer, you MUST trust the certificate also in the remote machine on Local Computer -> Trusted Root Certification Authorities.

4.1.5 Restore Last Open Screen and Zoom

The **Restore Last Open Screen and Zoom** property is a project property that is used to reload the last screen opened by the user and resets the zoom status and the position of the scrollbars. The property is unchecked by default.

Figure 40: Restore Last Open Screen and Zoom



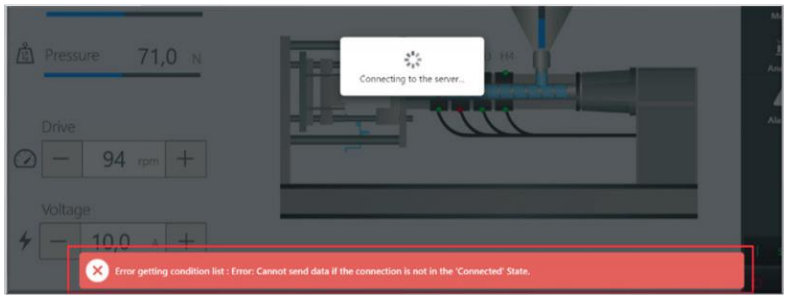
Notes :

1. The Zoom scenario will not work when the zoom functionality is applied with the touch screen on the RXi HMI device.
2. To properly configure the zoom functionality, apply the zoom feature with a mouse (using the Ctrl button and mouse scroll wheel) or use the Chrome settings zoom value.

4.1.6 Communication Error

When the user stops and starts the server while the WebHMI is already running, the values displayed may not update or the WebHMI may display the error message seen in Figure 41.

Figure 41: Communication Error



It takes around 60 seconds to get the updated values or come out of the error state automatically.

4.1.7 Supported Drivers for Movicon WebHMI

Manufacturer	Protocol	Requirements	Package
3S	CODESYS	3S Software CODESYS SoftPLC version 3.	Automation
Beckhoff	Beckhoff TwinCAT ADS	Beckhoff TwinCAT system	Automation
B&R	B&R	B&R devices that implement the communication protocol INA2000	Automation
Fatek	Fatek	All Fatek Plc supporting FATEK Communication Protocol on TCP.	Automation
GE (Emerson)	GE Ethernet	Support GE intelligent platform PLCs series 90, GE intelligent platform micro series	Automation
Hilscher	Hilscher CIFX Fieldbus Multiprotocol	Hilscher cifX card for fieldbus PCI interface	Automation
Mitsubishi	Melsec FX	PLC MELSEC-FX and MELSEC-FX2N PLCs and compatible	Automation
Mitsubishi	Melsec FX3U-TCP	PLC MELSEC-FX3U	Automation
Mitsubishi	Melsec Q TCP	Melsec Q PLC	Automation

Manufacturer	Protocol	Requirements	Package
Omron	EtherNet/IP	Omron NJ, NX PLCs	Automation
Omron	Fins Ethernet	Omron SYSMAC PLCs	Automation
Panasonic	FP MEWTOCOL	PLC NAIS FP Series	Automation
Rockwell Automation	Allen Bradley -EtherNet/IP	PLC-5, SLC-500, MicroLogix, ControlLogix, CompactLogix and FlexLogix	Automation
SAIA-Burgess	Saia S-BUS Serial	All Saia PLCs, PCD Series	Automation
Siemens	S7-Ethernet TCP	Simatic-S7-200-300-400 Vipa System 200v, 300v, 300s	Automation
Siemens	Siemens PC Adapter MPI	Simatic PLCs-S7-300-400, Vipa PLCs and compatible device	Automation
Siemens	S7-TIA PORTAL (Symbolic)	Simatic-S7-1200-1500	Automation
Siemens	Siemens PPI	Simatic-S7-200 and compatible	Automation
Modbus	Modbus Serial RTU	Any standard Serial Plug and Cable supported device	Basic
Modbus	Modbus TCP-IP Master	Any standard Modbus slave device	Basic
Modbus	Modbus TCP-IP Slave	Any standard Modbus Master device	Basic

Manufacturer	Protocol	Requirements	Package
OPC Foundation-Progea	OPC UA Client	All OPC UA Server	Basic
Progea	SQL Driver	SQL Driver is able to connect to a database server that supports the TCP/IP protocol.	Basic
BacNet/IP	BacNet/IP	Any device supporting Bacnet IP	Facilities
Konnex KNX	KNX EIBUS (Falcon) Ethernet	Building automation device supporting or compliant KNX	Facilities
Endress+Hauser	Energy Manager RMS621	Endress+Hauser Energy Manager RMS621.	Facilities
SNMP	SNMP Manager	Device supporting SNMP protocol acting as SNMP Agents	Facilities
IoT PubNub	PubNub IoT Cloud	PubNub Applications	IOT
IoT Progea Databoom	IoT Progea Databoom	IoTProgeaCloud Applications on Databoom Cloud Platform	IOT
MQTT	MQTT Client	Support MQTT brokers	IOT

4.2 Licensing

4.2.1 Movicon Editor Licensing

The customer needs to contact the Progea support team for Movicon Editor license.

Movicon WebHMI Runtime License

This section describes the licensing of Movicon WebHMI running on RXi HMI.

Movicon WebHMI Runtime license will be activated by default on the RXi HMI device. Movicon WebHMI license Locking occurs during image deployment at the Factory. License Daemon checks and identifies HW and gets product SKU from the License file. License Daemon reads HW MAC address and writes a MAC address in the license file. The license file is a JSON template file with the name "license.json".

License is locked to a specific MAC address and uses the OpenSSL toolkit to create a signed digest from the license file. The signed digest is written to the signature file named "license. sig".

Checking Movicon Editor License

Select the command: **Options > License->Check License** menu from the project's toolbar to check the Movicon Editor License as shown below:

Figure 42: Editor License

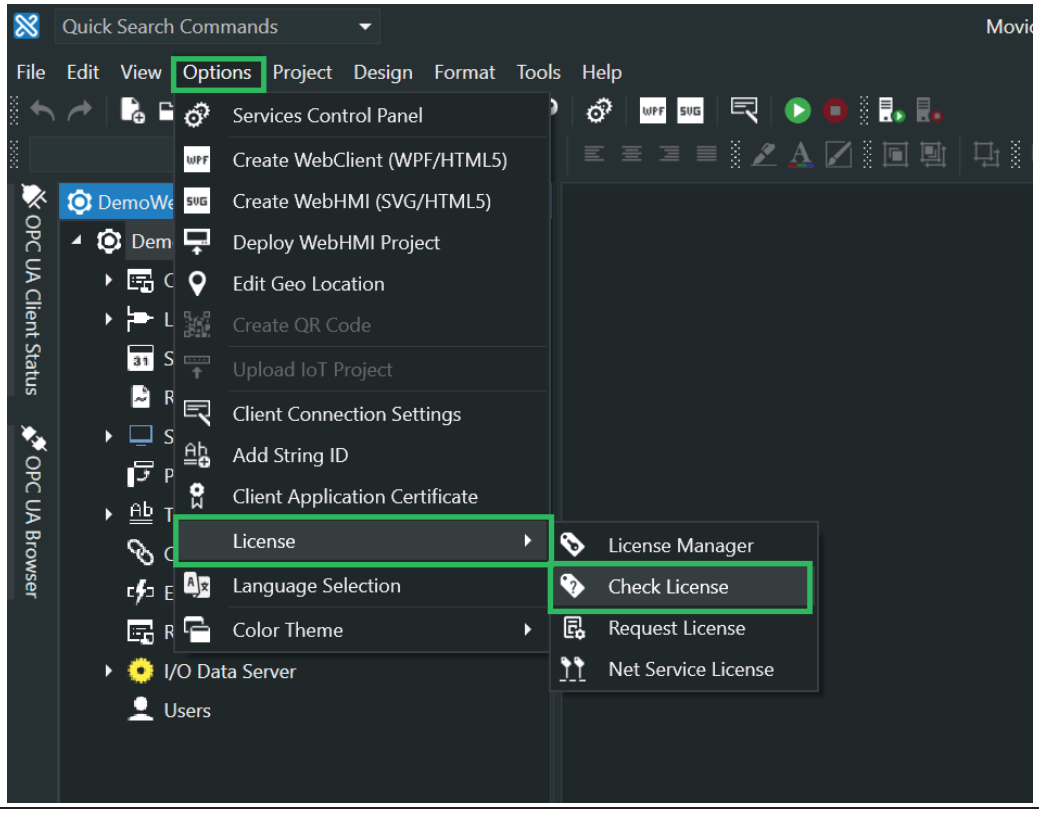
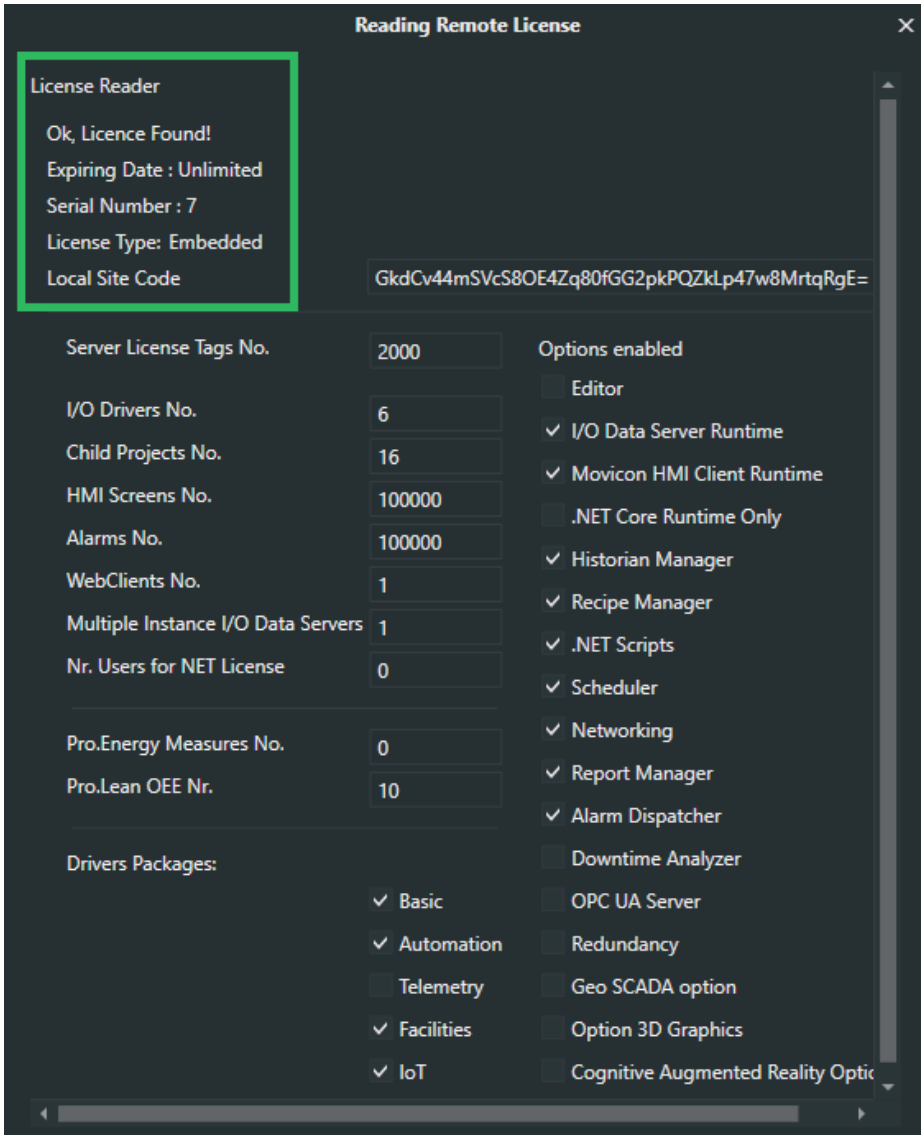


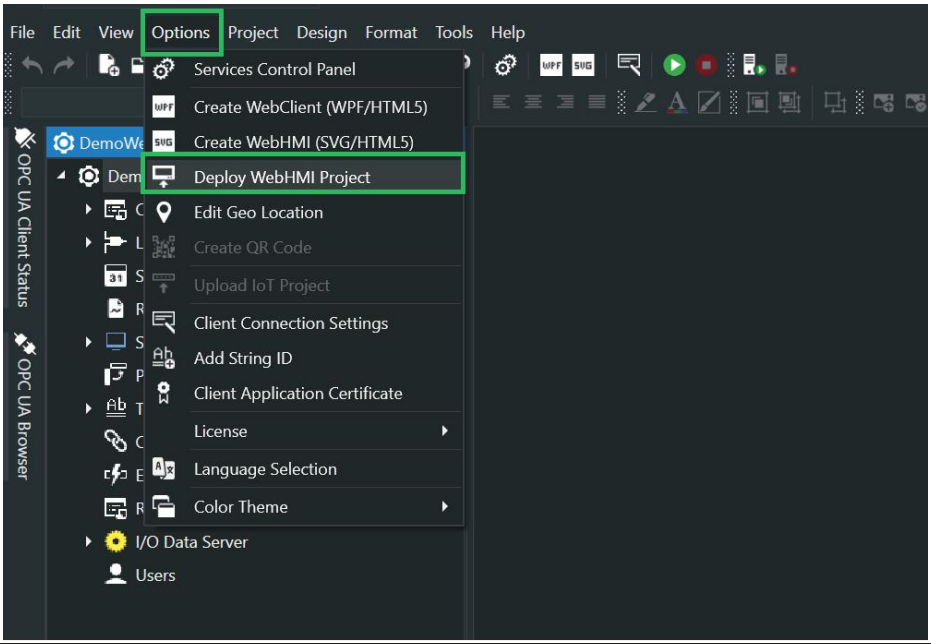
Figure 43: License Validated



4.2.2 Checking Movicon WebHMI Runtime License

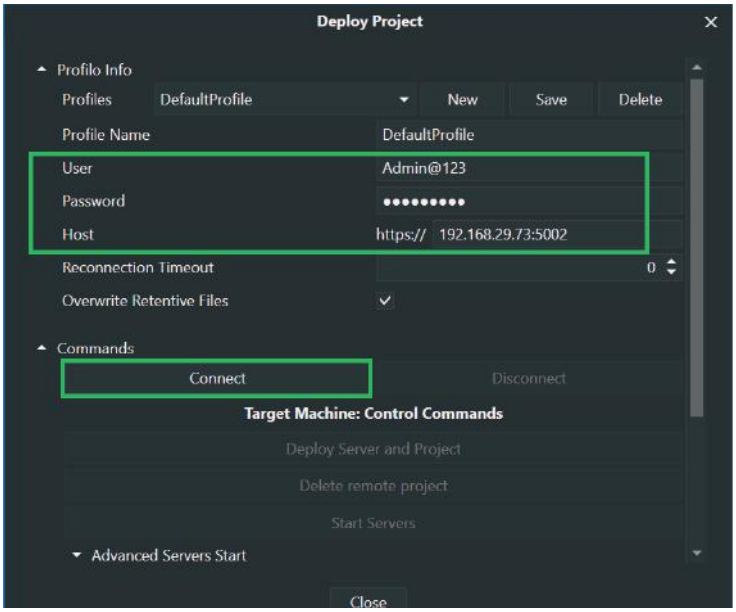
1. Click the **Options** menu from the toolbar and select the **Deploy WebHMI Project** to check the Movicon WebHMI Runtime License.

Figure 44: Deploy WebHMI Project



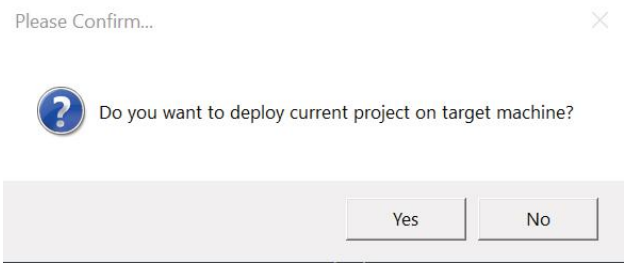
2. Enter the username, password, and IP address as seen in Figure 45. Click the **Connect** command button.

Figure 45: Connect Command



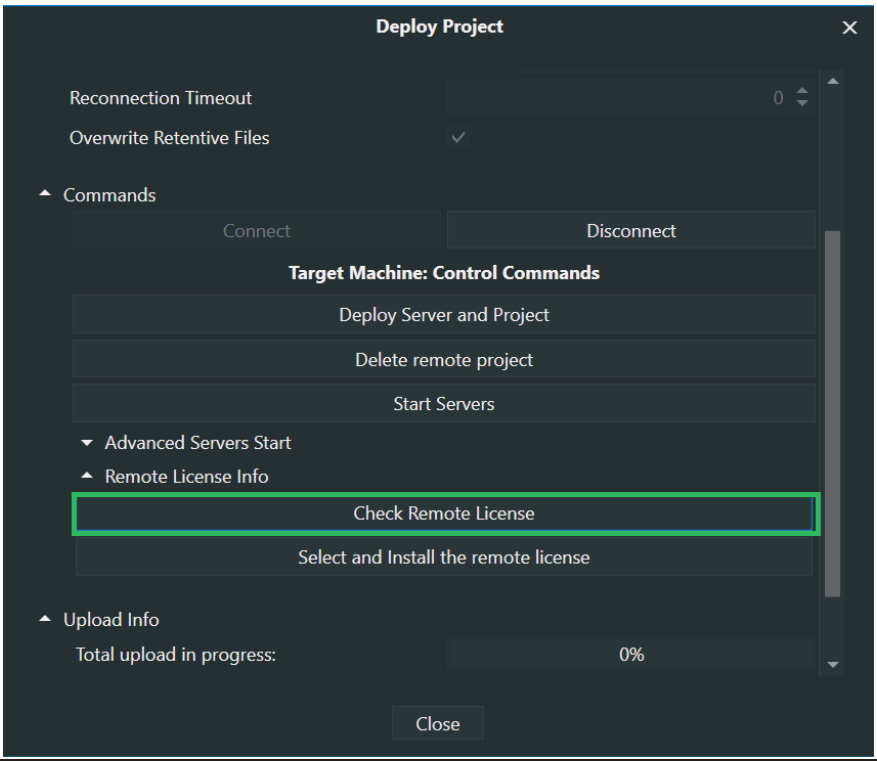
3. The application will ask the user if they want to deploy the current project on the target machine. Select **No**.

Figure 46: Confirm Running on Target Machine



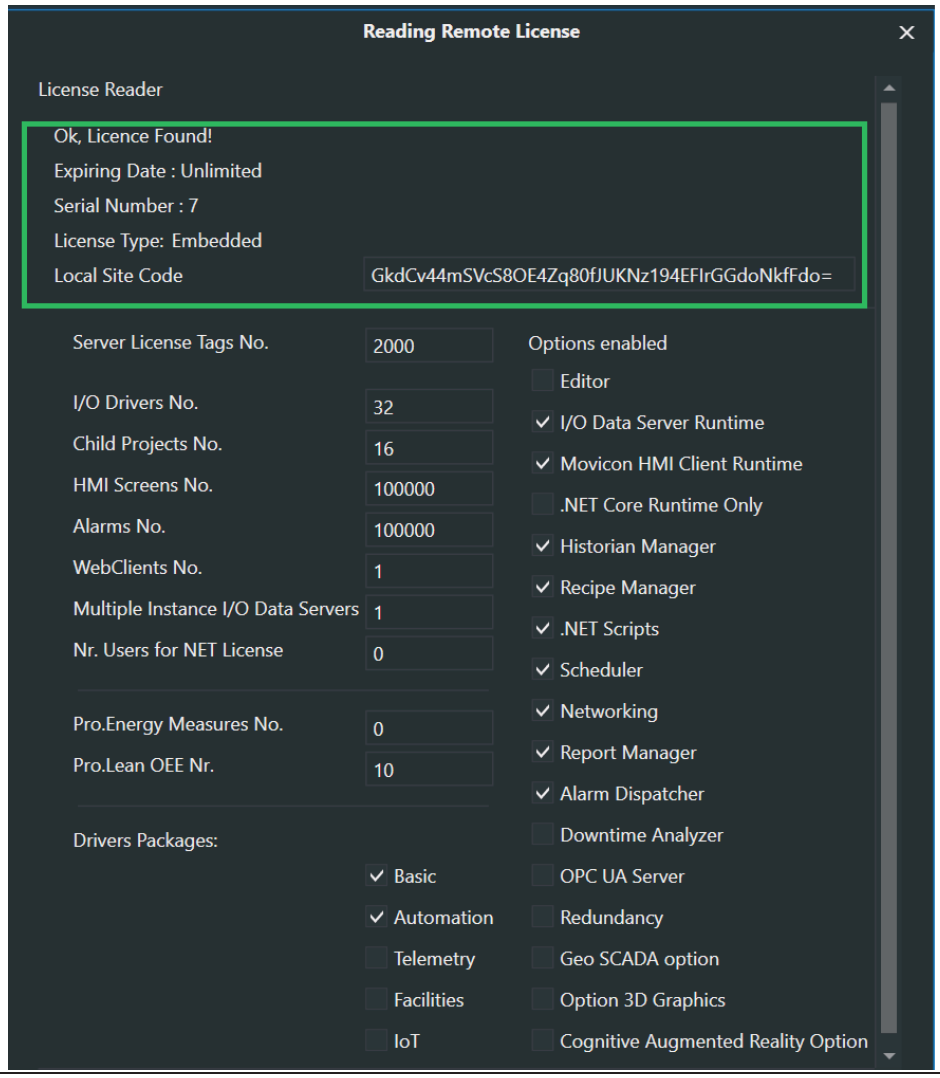
4. Navigate to the **Remote License Info** section in Deploy Project Window and click the **Check Remote License** option to check the Movicon WebHMI Runtime License on RXi HMI.

Figure 47: Check Remote License



5. Fetch the License information from RXi HMI and display window to the user as shown in Figure 48

Figure 48: License Found



Note: Browse to the Path *C:\Users\Public\Documents\Progea\DeployServer.NExT 4.1\Projects\<Project Name>\Log*. Open the System Log and check for the string **You're running in demo mode**. This is another way the user can check the Movicon WebHMI Runtime License on the RXi HMI device.

Section 5: RXi HMI OI Utilities

The RXi HMI OI Utilities can be launched from the desktop using the shortcut icon as shown in Figure 49 or from the Start menu as shown in Figure 50.

Figure 49: Desktop Icon

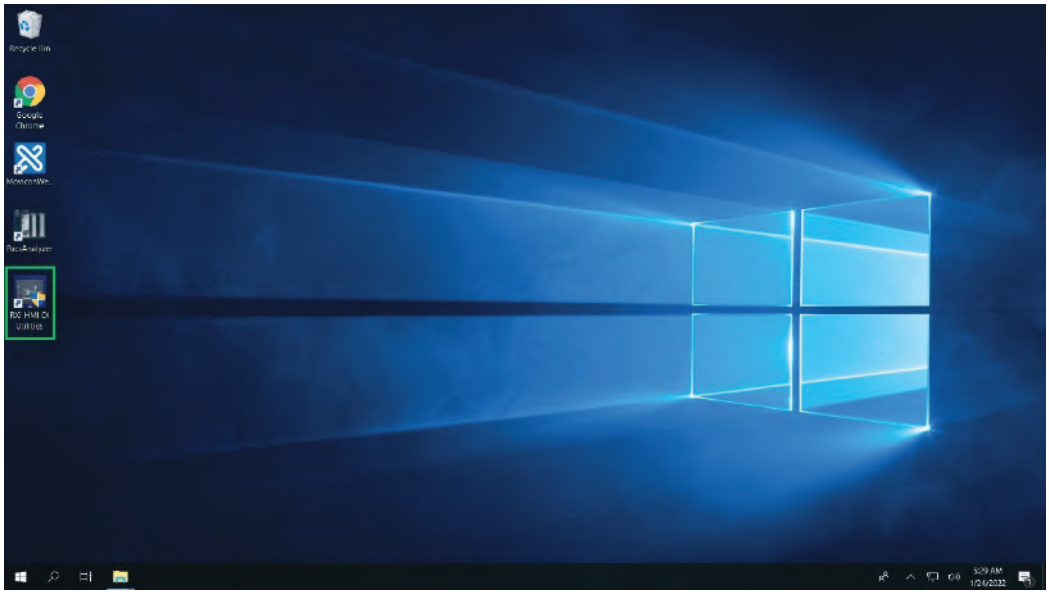
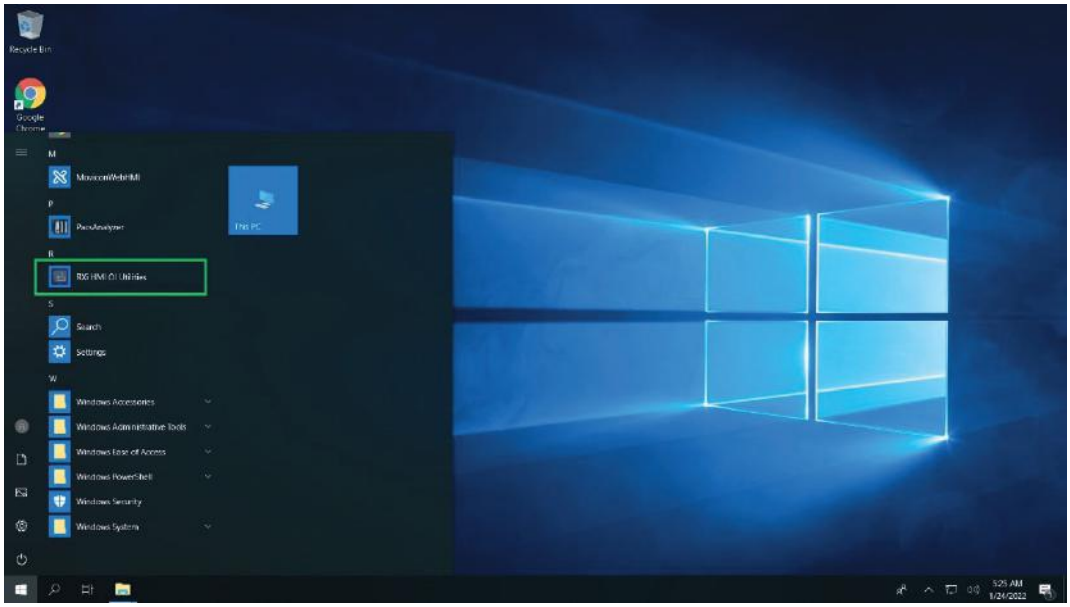


Figure 50: Start Menu Icon



Note: Once the user clicks the RXi HMI OI Utilities then the UAC dialog will be prompted as shown in Figure 51. S Click **Yes** to launch the application.

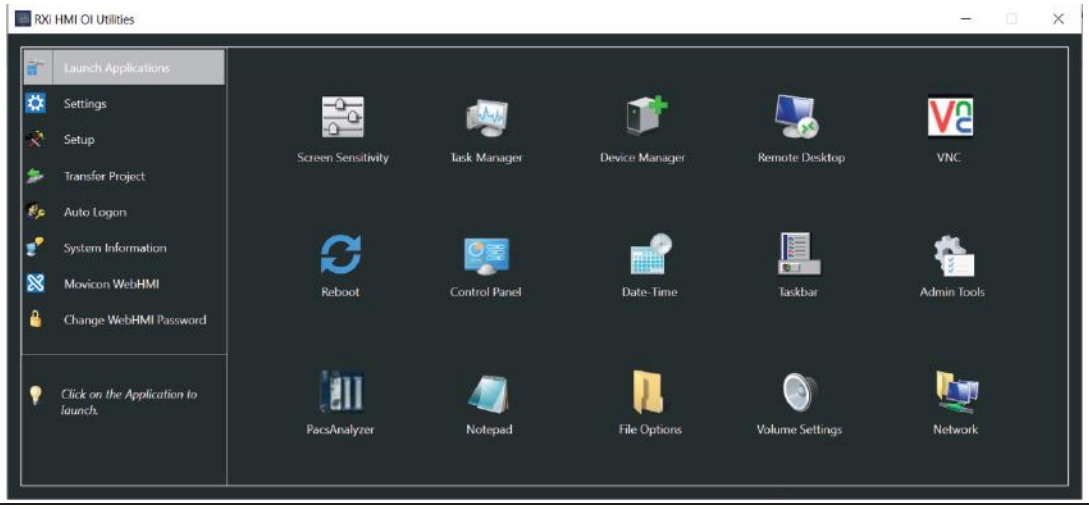
Figure 51: UAC Promt

5.1 Launch Application

Launch Application contains frequently RXi HMI applications. The user needs to click on the icon to launch the application. An application like Screen Sensitivity, Task Manager, Device Manager, Remote Desktop, VNC Server, Reboot to reboot the RXi HMI device, Control Panel, Date-Time, Taskbar, Admin Tools, PacsAnalyzer, Notepad, File Options, Volume Settings, Network.

1. Launch **RXi HMI OI Utilities**. Select **Yes** on the UAC prompt dialog.
2. Navigate to the **Launch Application** page under **RXi HMI OI Utilities.**
3. Click the icons to launch the application.

Figure 52: Launch Tool



5.2 Settings

Settings page enables to store the settings of certain parameters of RXi HMI to a file (the extension assigned to this file type is .rbs) and then apply/restore the saved settings to the same RXi HMI or any other RXi HMI from the saved .rbs file, whenever required.

1. Launch **RXi HMI OI Utilities**. Select **Yes** on UAC prompt dialog.
2. Navigate to the **Settings** page under **RXi HMI OI Utilities.**

The settings page has two associated tabs:

1. System
2. Registry

System Tab – This tab has the different names of different settings that the user can select to save the setting's value to the file.

Note:

1. The System tab of the settings page is not used for setting the values for any device parameters. It is only used to make the selection of the parameter settings, that the user wants wishes to a file.
2. The feature supports saving and restoring static IP addresses.
3. Saving and restoring Date-Time will save or restore Time Zone information.
4. Restoring Display(Screen Rotation) is not allowed using Remote Desktop.

Registry Tab – This tab provides the option to the user to update values to keys in the device registry and save these records to the file so that the stored values can be restored to the corresponding keys, on the same RXi HMI at a later time, or, if needed, also on a different RXi HMI.

Figure 53: RXi HMI Settings - System Tab

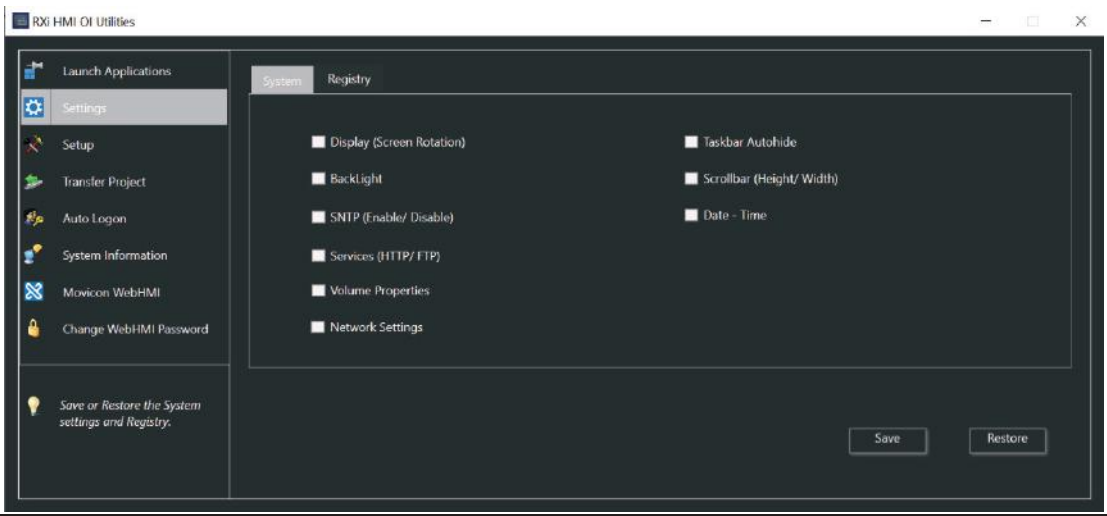
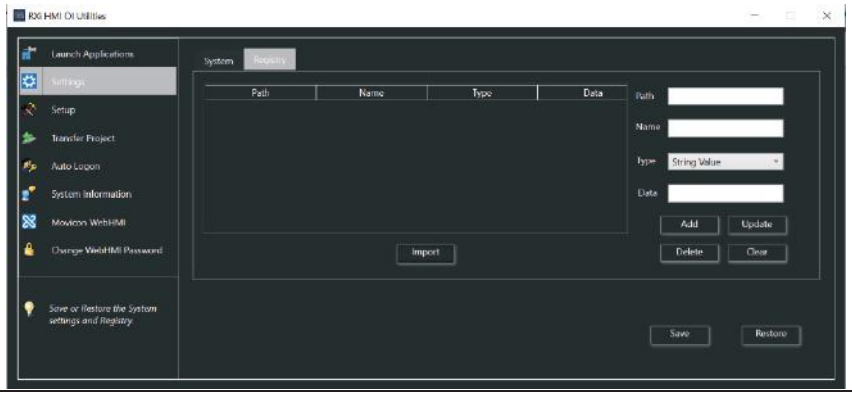
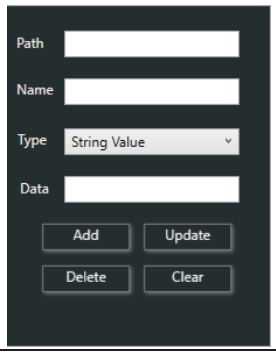


Figure 54: RXi HMI Settings - Registry Tab



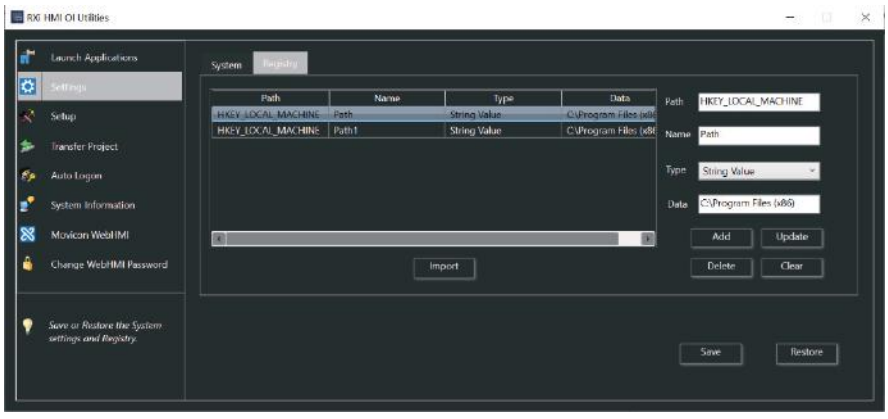
To update the value to a registry key, the user needs to click on the **Update** button which is shown in Figure 55. This figure will provide the user the values necessary for the Key Path, Name, Type, and Data. After entering the values, click the **Add** button to save the data and the entered data may be viewed as a record in the Registry tab.

Figure 55: Add Registry Key on Registry Tab



The entered data can be edited by selecting the record in the list box and It will update the data by clicking on the **Update** button. We can delete the registry from the registry list as well by clicking on the **Delete** button. All the entries, which are shown in Figure 56, will be cleared after clicking on the **Clear** button.

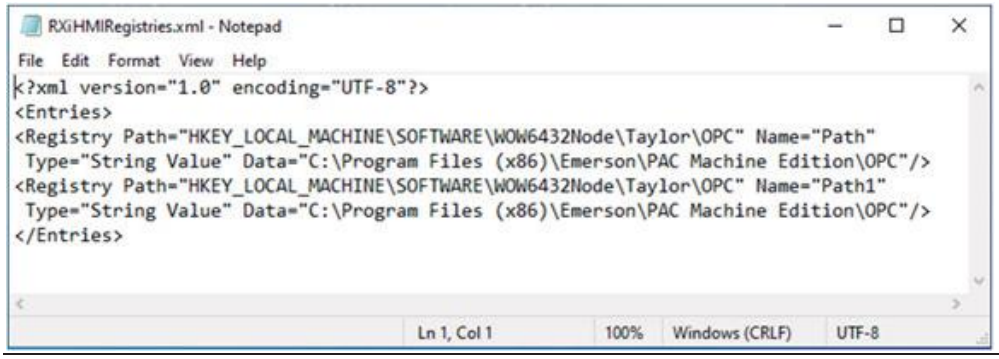
Figure 56: Registry List Display on Registry Tab



5.2.1 Import Registry Data from XML File

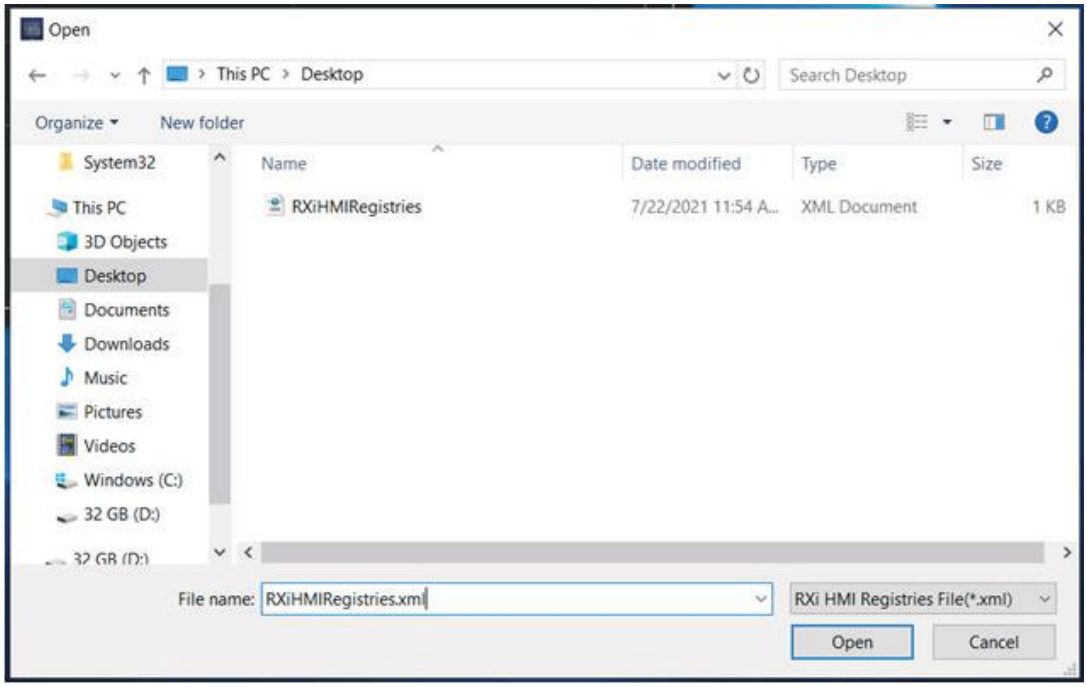
An alternate method to input the data to the registry is by using the Import option where the registry value data is available in an XML file and then imported using the Import option in the dialog. The schema of the XML data can be seen in the screenshot below.

Figure 57: XML Schema for Registry



1. Click the **Import** button and browse for the XML file to be imported.

Figure 58: Import XML Feature



Note: The feature does not support editing any registry keys inside HKEY_CLASSES_ROOT.

5.2.2 Save the Settings to a File

To save the settings and registry values to a file, click on the **Save** button. It displays the file save dialog, allowing the user to select the folder location and provide the file name. Click the **OK** button which is shown in Figure 59 to complete the creation and saving of data to the file.

Figure 59: Saving the Settings and Registry Values to a File

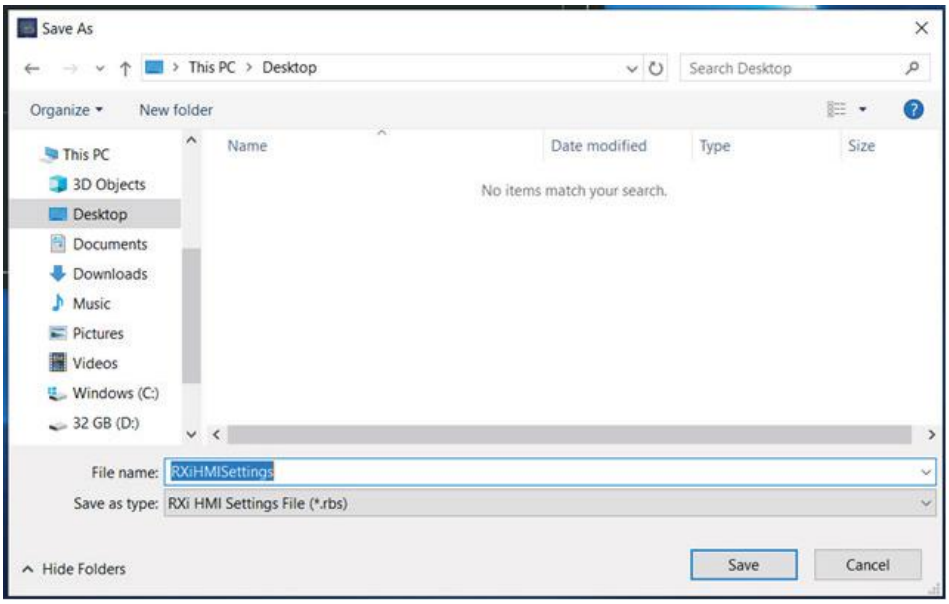
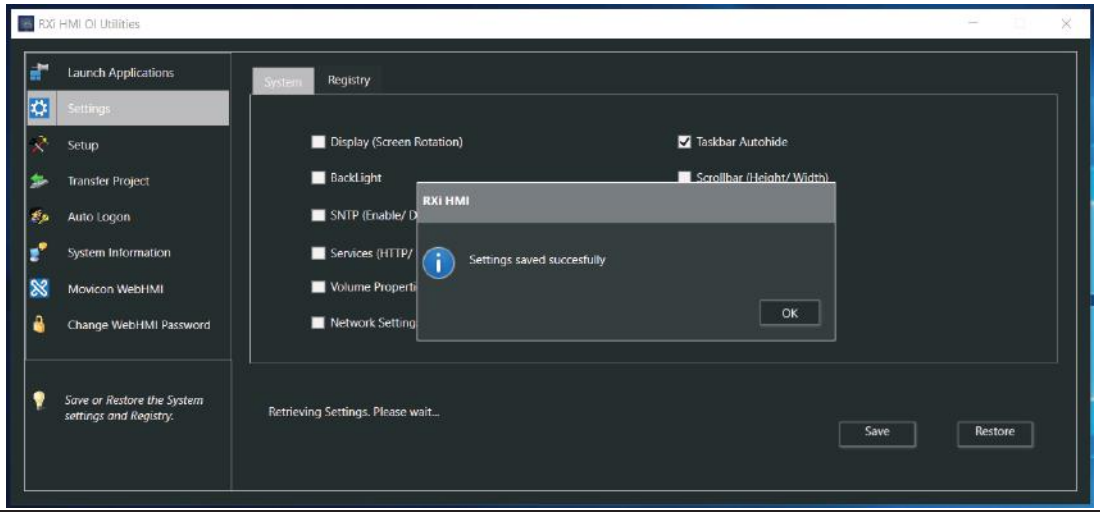


Figure 60: Save Function Successful Notification



5.2.3 Restore the Settings from a (.rbs) File

To restore the settings from a file to an RXi HMI, the following steps need to be executed:

1. Make sure that the file is browsable from the target RXi HMI.
2. Click on the Restore button, select Ok when prompted for confirmation which is shown in Figure 61.
3. In the Open File dialog, browse and select the (.rbs) file from which you would like to restore the data, then click on the Open button which is shown in Figure 62.
4. Once the .rbs file is restored then It will ask to restart the RXi HMI to apply the settings on the device which is shown in Figure 63.

Figure 61: Restore Function

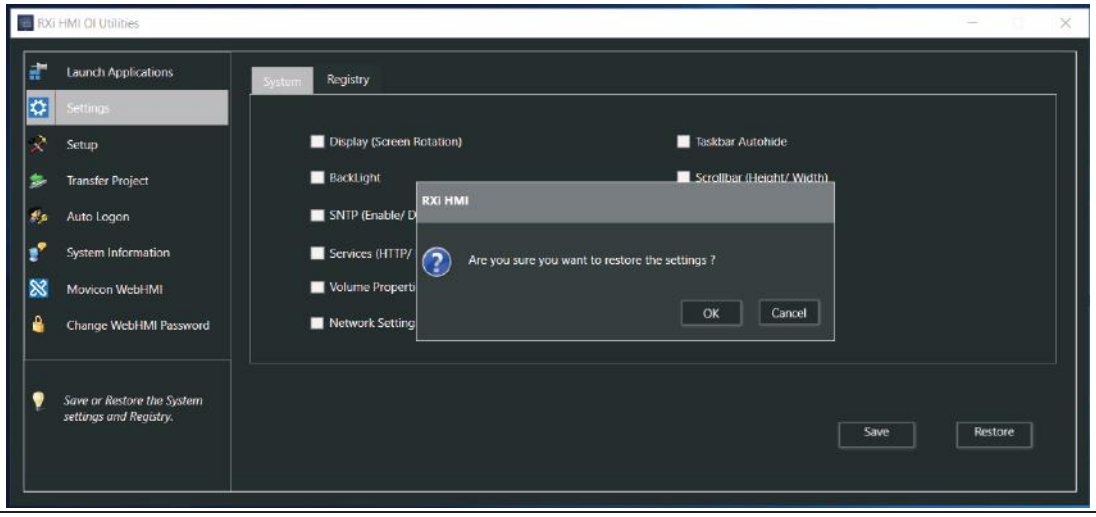


Figure 62: Browse to and select .rbs file

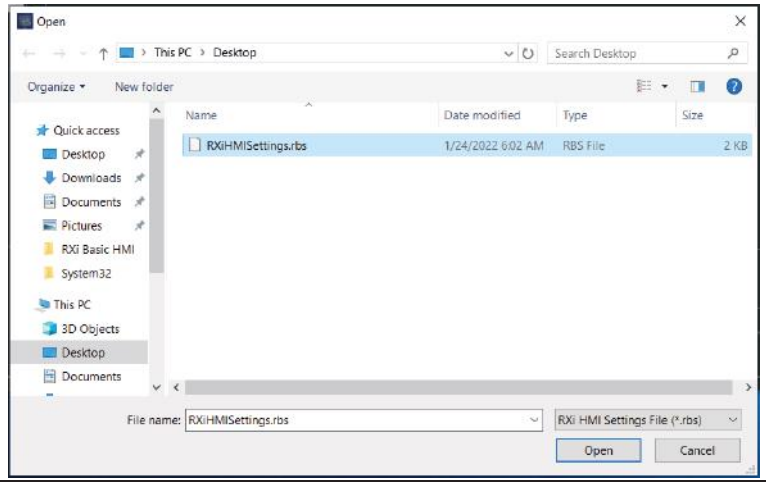
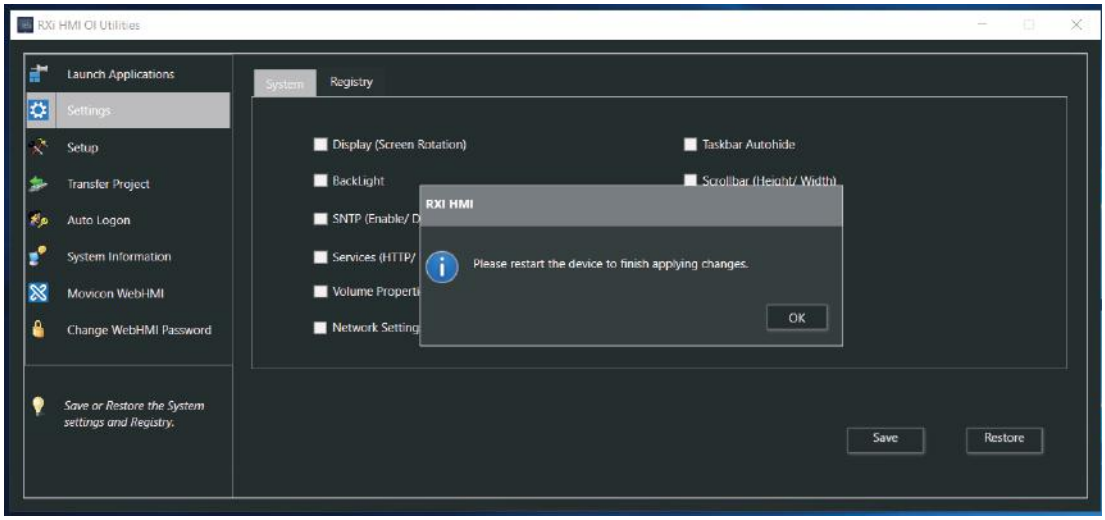


Figure 63: Settings Restored Notification



5.3 Setup

The Setup page under RXi HMI IO Utilities allows the user to configure settings on the RXi HMI. It contains various tabs which will provide multiple operations on RXi HMI.

- Backlight – It allows to configure the backlight/brightness.
- Display – It allows to change the screen display rotation like 0, 90, 180, and 270 degrees of RXi HMI.
- Services – It allows to enable or disable the FTP and HTTP services.
- SNTP – It allows to fetch the network time settings from the configured SNTP server.

NOTICE

To limit distraction the touchscreen will not generate a tone when pressed unless the device is connected to an external speaker.

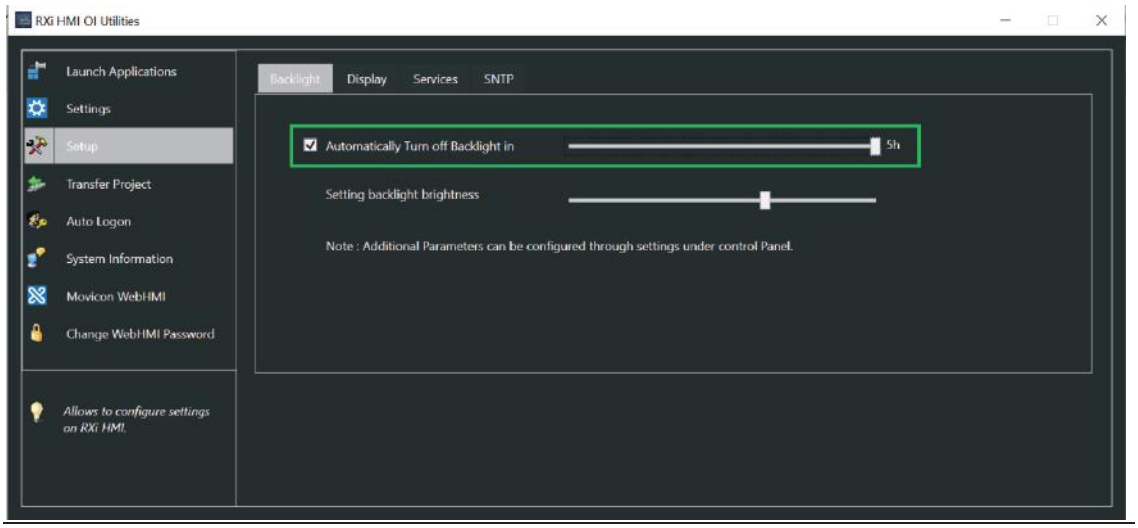
A cursor will not display when the touchscreen is pressed. .

5.3.1 Backlight Tab

Backlight Adjustment

1. Select the **Backlight** tab to configure the backlight.
2. The user can enable the **Automatically Turn off Backlight in** and specify an amount of time. The time intervals can be configured for 0 seconds (min.) to 5 hours (max.).
3. The user can set the backlight using the slider.

Figure 64: Backlight Adjustment

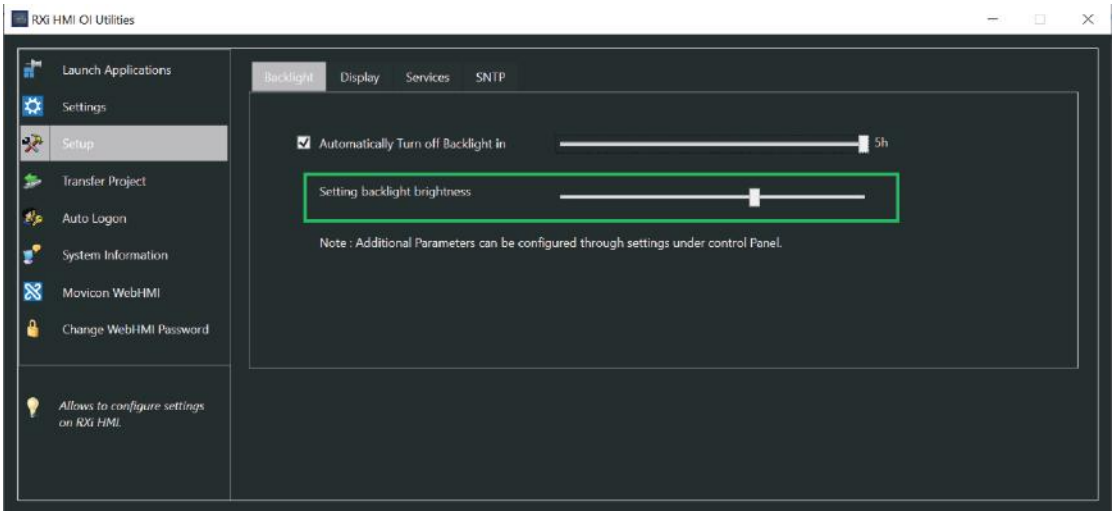


Brightness Adjustment

1. Select the **Backlight** tab to configure the brightness.
2. The user can adjust the brightness using the slider. The leftmost slider movement is set to low brightness and the rightmost slider movement is set to higher brightness. The value varies from 0 to 100.

Note: Additional Parameters can be configured through settings under the control panel.

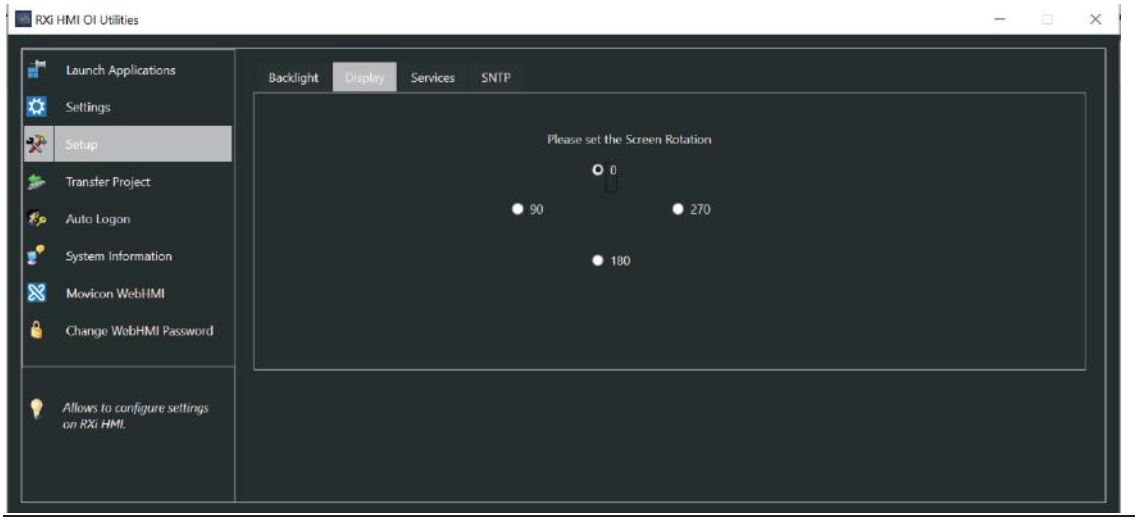
Figure 65: Brightness Slider in Backlight Tab



5.3.2 Display Tab

1. The **Display** tab has the RXi HMI screen rotation operations.
2. The user could set the display screen rotations on RXi HMI like:
   - 0º degree Rotation.
   - 90º degree Rotation.
   - 180º degree Rotation.
   - 270º degree Rotation.

Figure 66: Screen Rotation



Note: Display Screen Rotation cannot be changed when RXi HMI Device is connected through Remote Desktop.

⚠ CAUTION

Although Emerson recommends the use of the protective sheet, do not operate the touchscreen with any hard materials, such as a screwdriver. This could damage the touchscreen display.

5.3.3 Services Tab

Services tab will provide multiple operations on RXi HMI which are as follows

- Enable FTP Server
- Enable HTTP Server

Enable FTP Server

The File Transfer Protocol (FTP) server included with the RXi HMI unit supports standard (RFC 959). For secure transmission that protects the username and password and encrypts the content, FTP is often secured with SSL/TLS (FTPS) or replaced with an SSH File Transfer Protocol (SFTP).

Use RXi HMI Setup Tool to configure the FTP server. *By default, the server is not enabled.* Once enabled, a background program will run, waiting for clients to connect. Sessions that are idle for five minutes are terminated by the server.

The server supports the non-secure operation. All information including username, password, and data is transmitted with no encryption and is susceptible to packet sniffing and various FTP attacks.

To enable the FTP Server:

1. Navigate to **Control Panel\Programs and Features\Turn Windows features On or Off\Internet Information Services\FTP Server**. Check all checkboxes that apply.

Note: If the server status is changed, the RXi HMI must be restarted before changes take effect.

Enable HTTP Server

The HyperText Transfer Protocol (HTTP) server is included with the RXi HMI supports standard (RFC 2616). The HTTP server is configured with the RXi HMI Setup Tool. *By default, the server is not enabled.* Once enabled, a background program will run, waiting for clients to connect. An HTTP server can be accessed through the domain names of the websites it stores, and it delivers the content of these hosted websites to the end user's device. The server supports non-secure port 80 operations. Most browsers make HTTP requests on ports 80 and 443 by default.

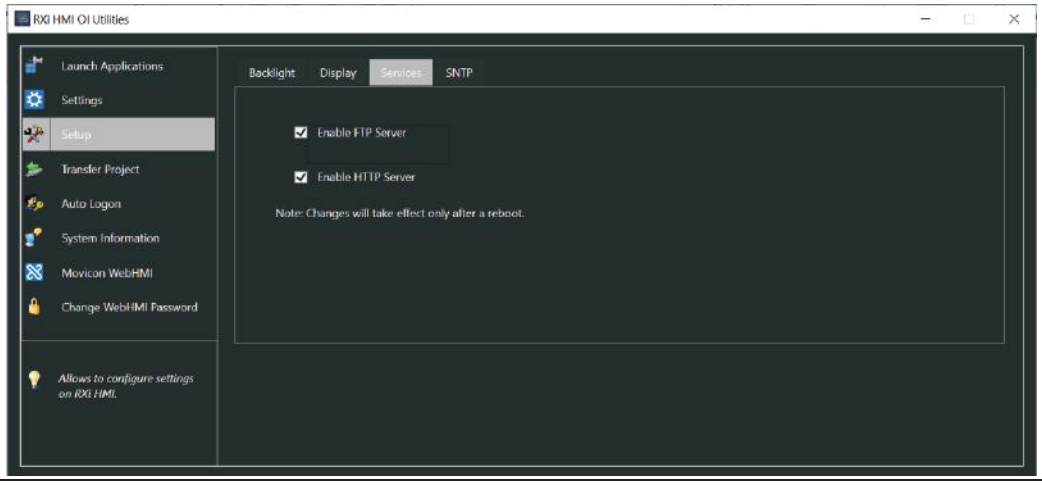
To enable the HTTP Server:

1. Navigate to **Control Panel\Programs and Features\Turn Windows features On or Off\Internet Information Services\Web Management Tools**. Check all checkboxes that apply.
2. Navigate to **Control Panel\Programs and Features\Turn Windows features On or Off\Internet Information Services\World Wide Web Services**. Check all checkboxes that apply.

Note: If the user checked the FTP Server then we can see that the FTP service is running on RXi HMI.

Note: If the server status is changed, the RXi HMI must be restarted before changes take effect.

Figure 67: Services Tab



5.3.4 SNTP Tab

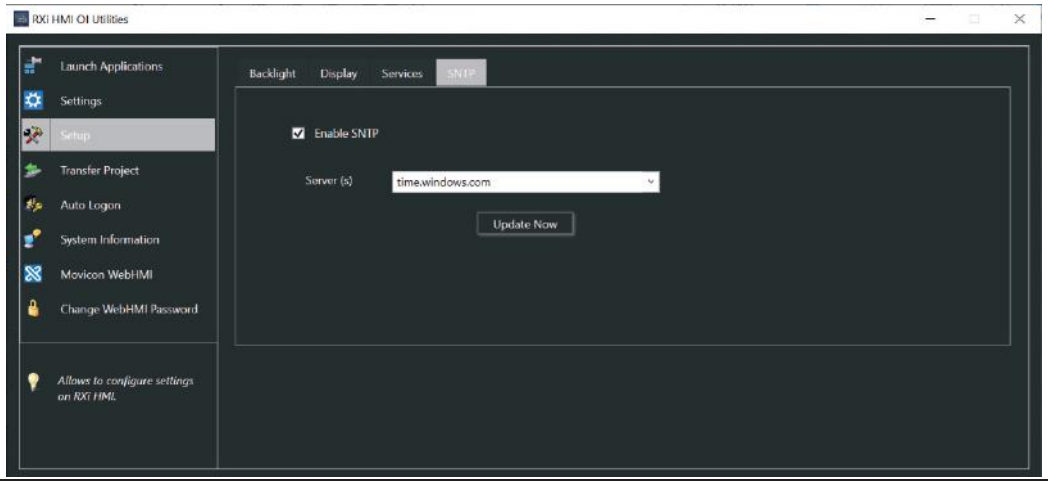
The SNTP tab allows fetching the network time settings from the configured SNTP server Select the **SNTP** tab to update the RXi HMI system time.

The SNTP server included with the RXi HMI supports SNTP Version 4 for IPv4, IPv6, and OSI. By default, the server is not enabled. The SNTP server supports non-secure UDP port 123 operations.

1. Check **Enable SNTP**.
2. Select from the drop-down or enter the server's name manually to configure the server.
3. Click on **Update Now.**
4. The RXi HMI will fetch the date and time from the configured server

Note: The user can enter multiple server names with comma-separated values.

Figure 68: SNTP Tab



5.4 Transfer Projects

The Transfer Projects Page will allow the user to perform multiple operations on RXi HMI which are listed below:

1. **Copy Project**: This operation copies the projects of RXi HMI to Removable Media transfers using SD cards.
2. **Project Update**: This operation updates the projects that are currently stored on the RXi HMI unit with a revision stored on a flash device, such as a Removable Media.
3. **Restore Project:** This operation restores the saved projects to any other RXi HMI from the Removable Media.

The installed Movicon WebHMI is secured with user and password. The user shall be able to proceed only when the credentials are successfully authenticated.

Note: The default user and password are **Admin@123**.

5.4.1 Copy Project

⚠CAUTION

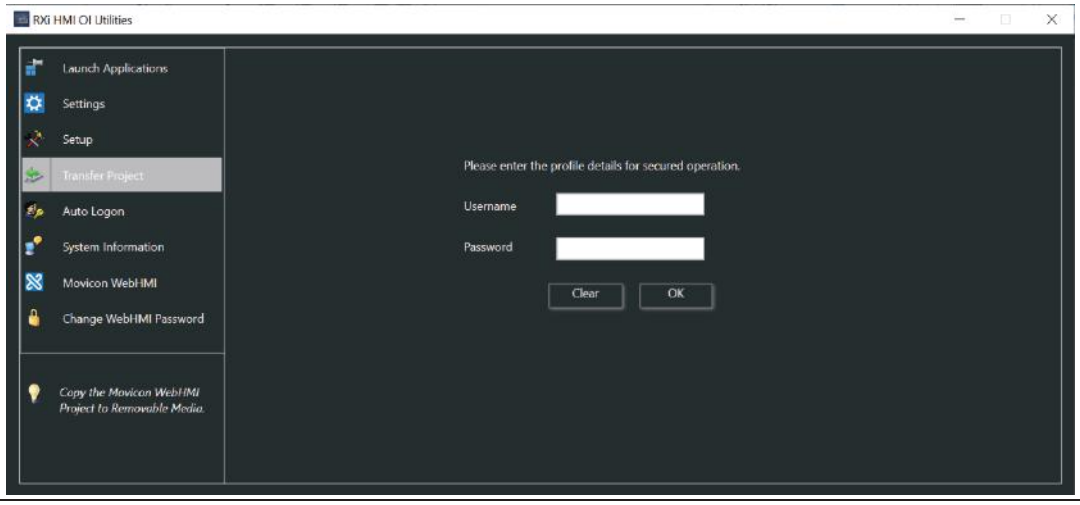
Before disconnecting power, verify that the copy or update operation is complete (no busy message or wait cursor).

To copy a project to a Removable Media:

1. Verify that there is a blank USB plugged into RXi HMI. FAT32 type is supported.
2. Launch **RXi HMI OI Utilities**. Select **Yes** on UAC prompt dialog.
3. Navigate to the **Transfer Projects** page under **RXi HMI OI Utilities.**
4. The user may need to select the target removable media if more than one is available on the RXi HMI.

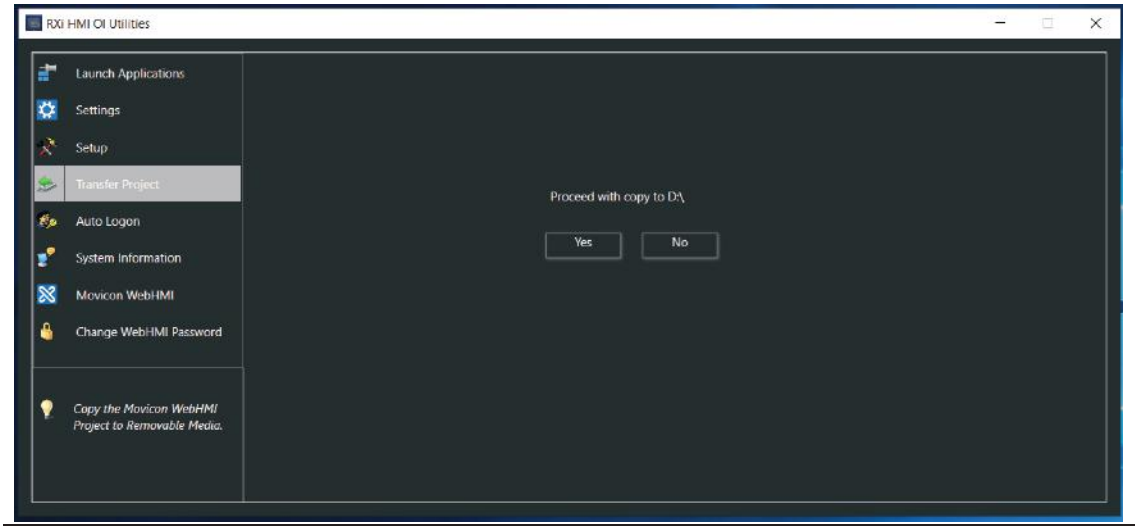
5. After the user selects specific media (drive) or the default media (when only a single removable drive is available), the system will request the user's profile credentials (project deployment credentials) (Figure 69).

Figure 69: Profile Credentials



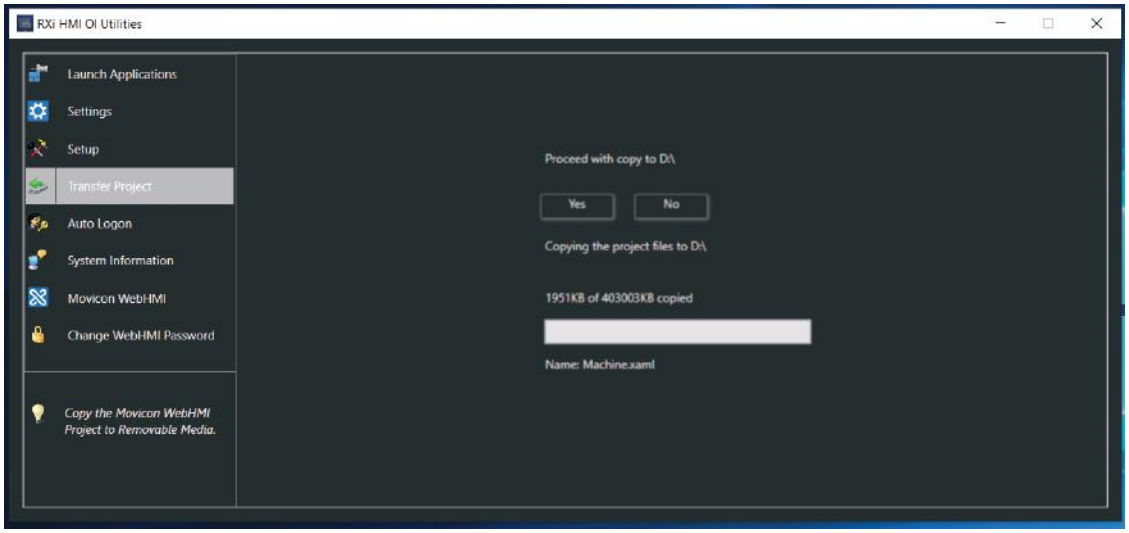
6. After successful credentials, it will launch the below dialog (Figure 70). The user needs to click on the **Yes** button to proceed with copy the projects.

Figure 70: Copy Confirmation



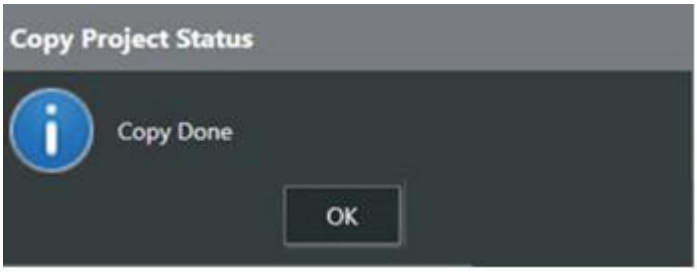
7. Once the user clicks on the **Yes** button, the projects will be copied to removable media as shown in Figure 71.

Figure 71: Copy Project Status



8. The status dialog box sill prompt a **Copy Done** message once projects are copied to the removable media (Figure 72). Click **OK.**

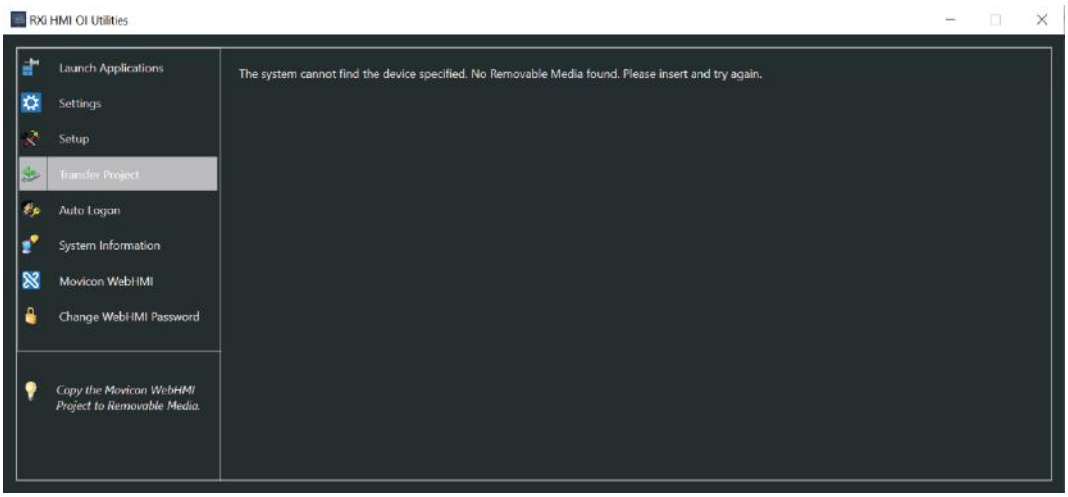
Figure 72: Copy Project Status



Note:

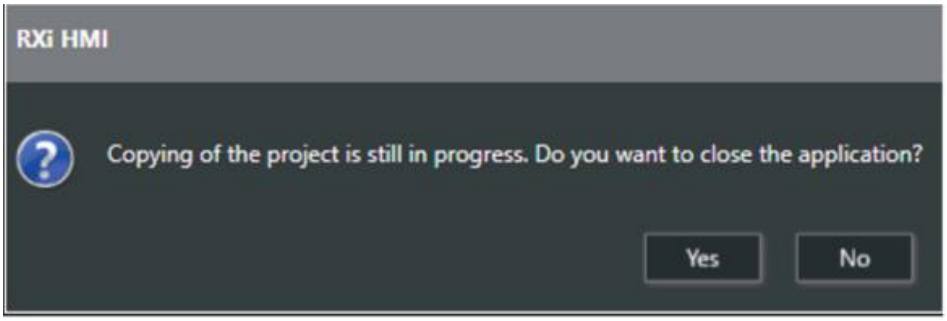
After selecting the **Transfer Projects** tree item, if RXi HMI cannot find the Removable Media, then the user will be prompted with the below message (Figure 73).

Figure 73: No Removable Media



While the project files are copying, if the user tries to close the dialog box, it prompts the below message (Figure 74) to the user. If the user clicks **Yes** it will stop the copying operation. If the user clicks on **No**, the project files will continue to copy.

Figure 74: Copy Still in Progress



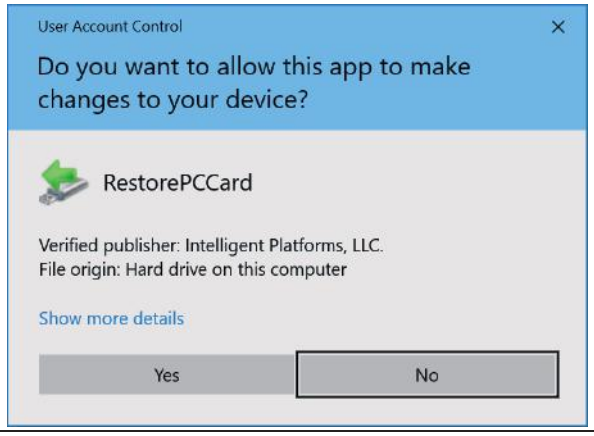
5.4.2 Restore Project from Removable Media

The Restore Project function restores the saved projects to any other RXi HMI from the Removable Media.

To restore a project to an RXi HMI:

1. After successfully copying the projects to the removable media, insert this removable media into the RXi HMI hardware and reboot the unit.
2. After powerup, the unit will prompt the user with the below dialog (Figure 75) to proceed to restore copied projects from the removable media to the RXi HMI.

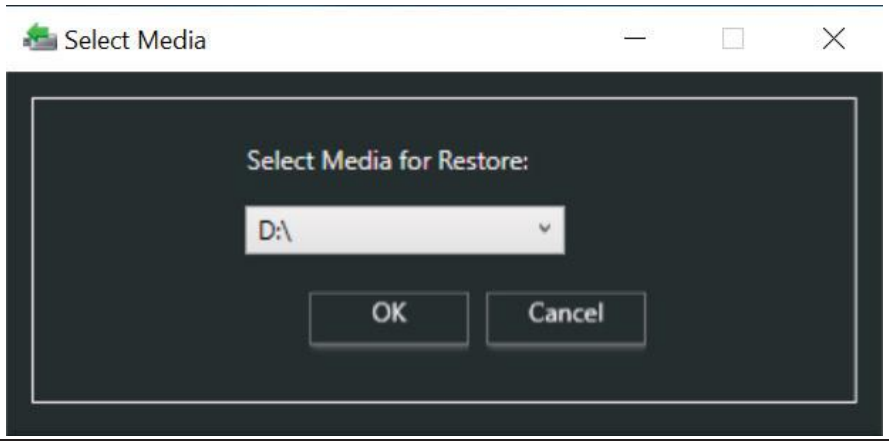
Figure 75: RestorePCCard



3. The user will now see the drive selection screen as shown in Figure 76.

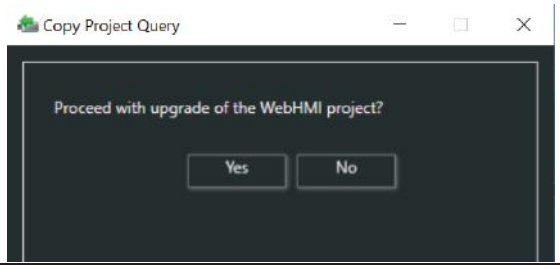
   Note: If there are only one removable media in the RXi HMI, the hardware will default to the mounted drive.

Figure 76: Select Media



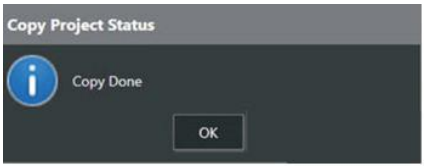
4. The user will see the prompt to proceed with the upgrade of the WebHMI project. Click the **Yes** button to proceed.

Figure 77: Proceed with Upgrade of the WebHMI Project



5. Once the project files are copied from removable media to RXi HMI, the user will see a **Copy Done** message (Figure 78).

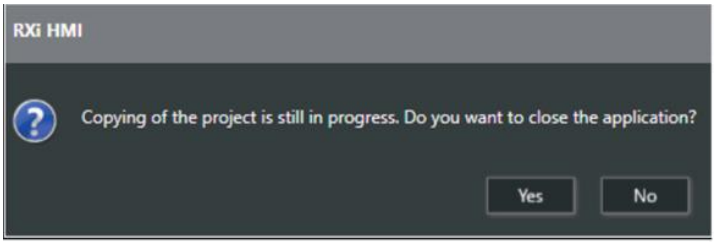
Figure 78: Copy Done



6. In a few seconds, a WebHMI screen will appear in the chrome browser in full-screen mode. Once the Chrome browser is launched, it can take up to one minute for the WebHMI screen to load completely.

   Note: While the project files are copying, if the user tries to close the dialog box, it prompts the below message (Figure 79) to the user. If the user clicks **Yes** it will stop the copying operation. If the user clicks on **No**, the project files will continue to copy.

Figure 79: Exit Application



7. The restore/ upgrade operation will start when the removable media files have finished copying using the transfer project instructions.
8. The WebHMI will not start until the restore/ upgrade process is completed.

5.5 Auto Logon

Users can configure the RXi HMI for auto logon. To enable/disable the feature:

1. Launch **RXi HMI OI Utilities**.
2. Select **Yes** on UAC prompt dialog.
3. Navigate to the **Auto Logon** page under **RXi HMI OI Utilities.**

Note: The following steps need to be performed for each user

4. Select the **Enable/Disable** option (as shown in Figure 80).

Enter the username, password, and domain (if available) and click **Apply**. If the entered credentials are valid, then the Auto Logon feature will be enabled/disabled for the specific user. The user will be prompted to either Reboot Now or defer to later as shown in

5. Figure 81.

If the entered credentials are not valid, an appropriate failure message will be shown to the user.

Figure 80: Auto Logon Page

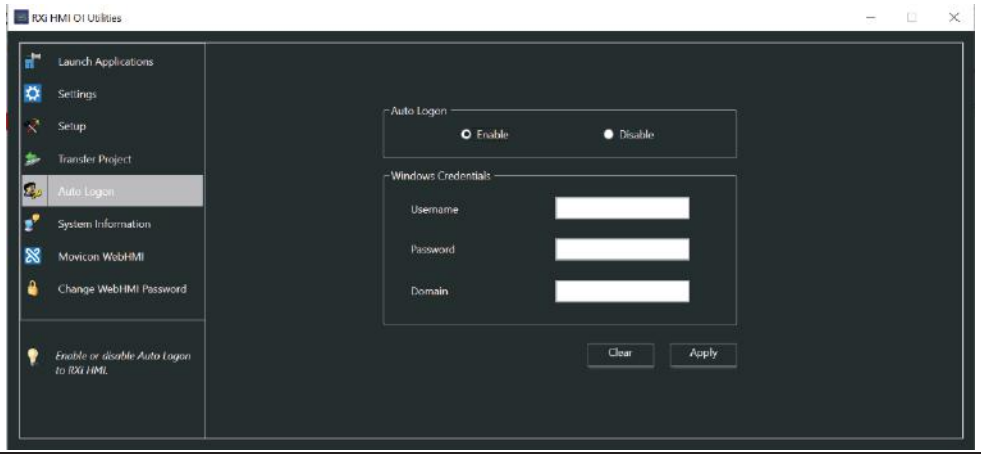
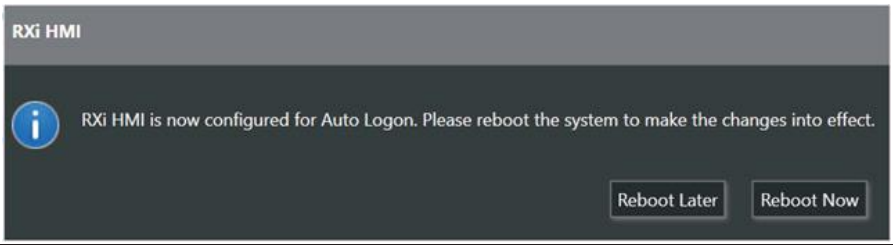


Figure 81: Reboot Options

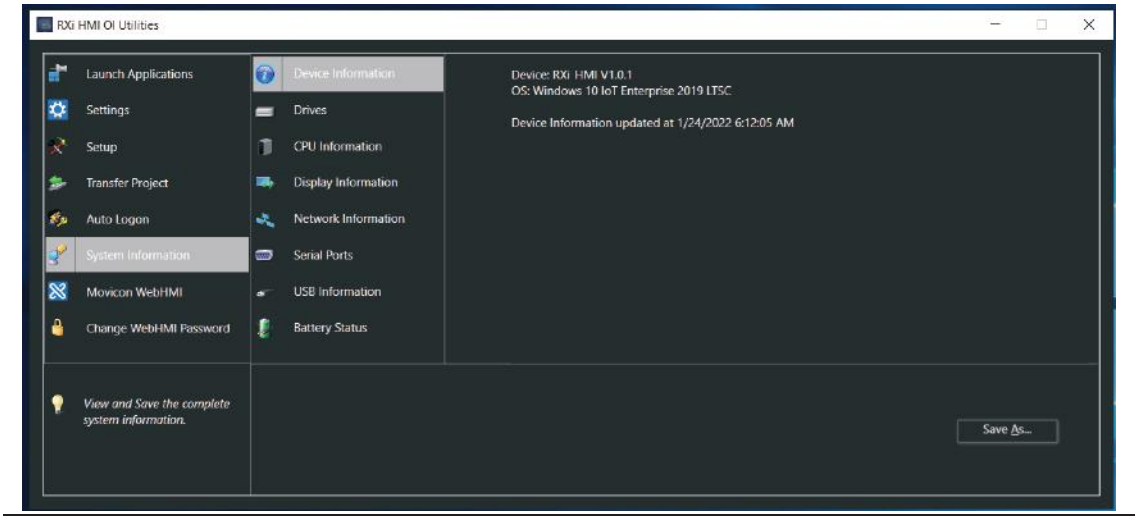


5.6 System Information

System Information tool provides you the important system configuration of RXi HMI and saves the system configuration into the System log file.

1. Launch the **RXi HMI OI Utilities**. Select **Yes** on UAC prompt dialog.
2. Navigate to the **System Information** page under **RXi HMI OI Utilities.**

Figure 82: System Information



The System Information tool is used to configure various system parameters:

Parameter	Description
Device Information	Displays information about this device.
Drives Information	Displays information about the mounted drives.
System Information	Displays configured system parameters.
Display Information	Displays information about the video display.
Network Information	Displays the assigned network parameters.
Serial Ports	Displays when the serial ports were last configured.
USB Information	Displays the assignment and status of the USB ports.
Battery Status	Displays the Battery Status and last update period.

5.7 Movicon WebHMI

Movicon WebHMI helps the user to launch deployed WebHMI Project. This page provides the details about the installed Movicon WebHMI version and deployed project name.

1. Launch **RXi HMI OI Utilities.** Select **Yes** on UAC prompt dialog.
2. Navigate to the **Movicon WebHMI** page under **RXi HMI OI Utilities**.
3. Click on the **Start WebHMI** button as shown in Figure 83.
4. WebHMI screen will run automatically in chrome browser with full-screen mode.
5. If the project is not deployed, then the Chrome browser will run automatically and display the message that **A Movicon WebHMI project couldn't be found on the device** for the first time. Please download the WebHMI project from Movicon configuration tool as shown in Figure 84.

Figure 83: Movicon WebHMI

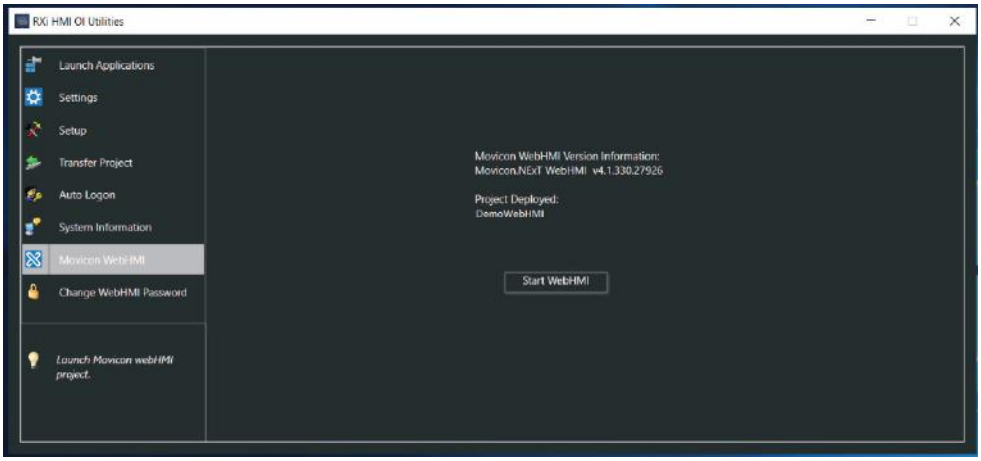
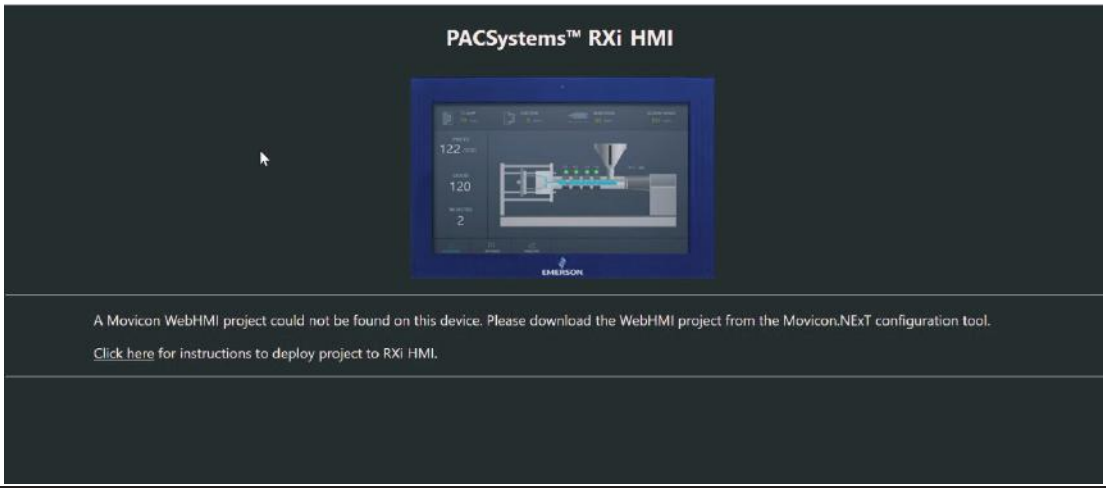


Figure 84: Default Page



5.8 Change WebHMI Password

This page helps to change the Movicon WebHMI password. The default user and password are **Admin@123**.

1. Launch **RXi HMI OI Utilities**. Select **Yes** on UAC prompt dialog.
2. Navigate to the **Change WebHMI Password** page under **RXi HMI OI Utilities.**
3. Enter the user and old Password.
4. Enter the New Password and Confirm Password
5. Click on **Apply** to change the password in Figure 85. A confirmation dialog will be prompted as shown in Figure 86. Click **OK** to proceed further.
6. If the user and old password are not valid, then the error dialog message **Incorrect User Or Current Password** will be prompted as shown in Figure 87.
7. If the WebHMI credential is valid, the password will be changed. A success message dialog will be prompted as shown in Figure 88.

Figure 85: Change WebHMI Password

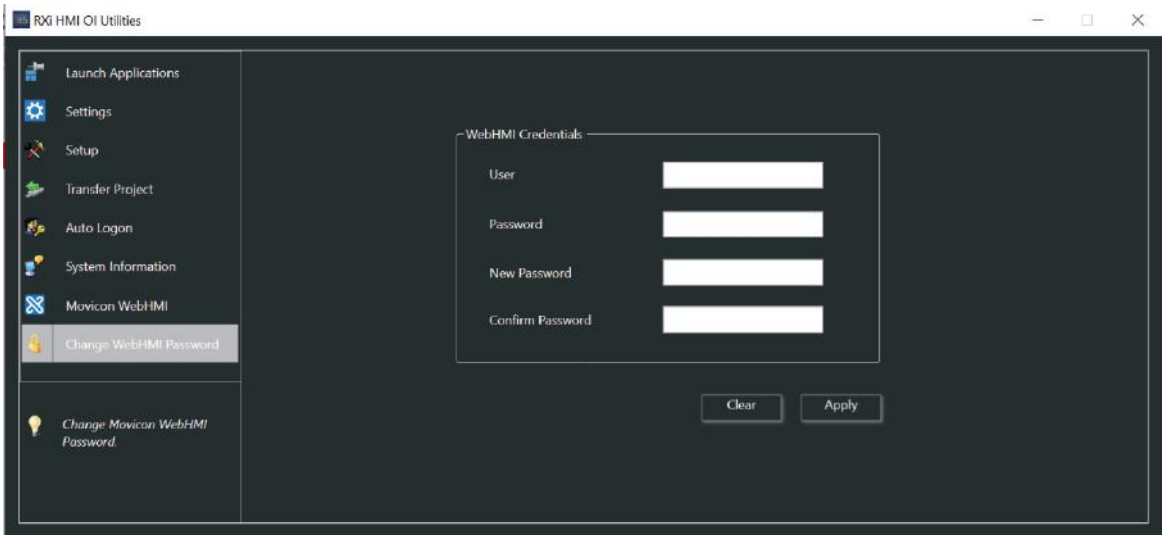


Figure 86: Confirmation Dialog

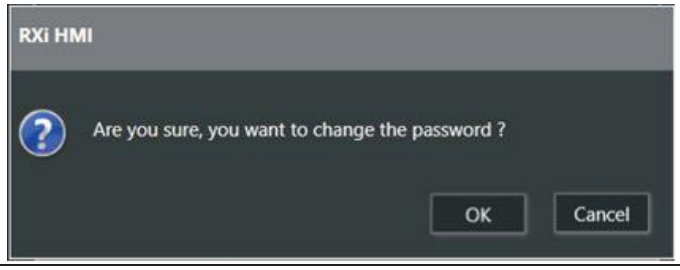


Figure 87: Error Message

Figure 88: Success Message

Section 6: Remote Connection

The RXi HMI can be connected remotely from a local PC. There are two ways to connect remotely:

6.1 Remote Desktop

1. Enable Remote Connection on RXi HMI. Select **Start** > **Settings** > **System** > **Remote Desktop** and turn on **Enable Remote Desktop**.
2. **On your local PC**: In the search box on the taskbar, type **Remote Desktop Connection**, and then select **Remote Desktop Connection**.
3. In Remote Desktop Connection, type the IP Address of the RXi HMI you want to connect to and then select **Connect**.

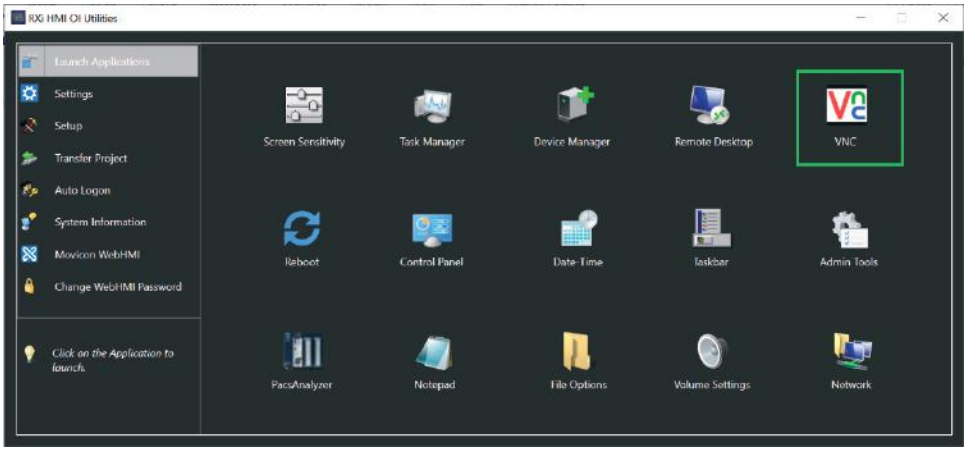
6.2 VNC Client

The user can use any VNC client software to connect the RXi HMI. To do so the user needs to start the VNC server on the RXi HMI device.

VNC Server can be launched with the following steps:

1. Launch **RXi HMI OI Utilities**. Select **Yes** on UAC prompt dialog.
2. Navigate to the **Launch Application** page under **RXi HMI OI Utilities.**
3. Click the **VNC** icons to launch the application.

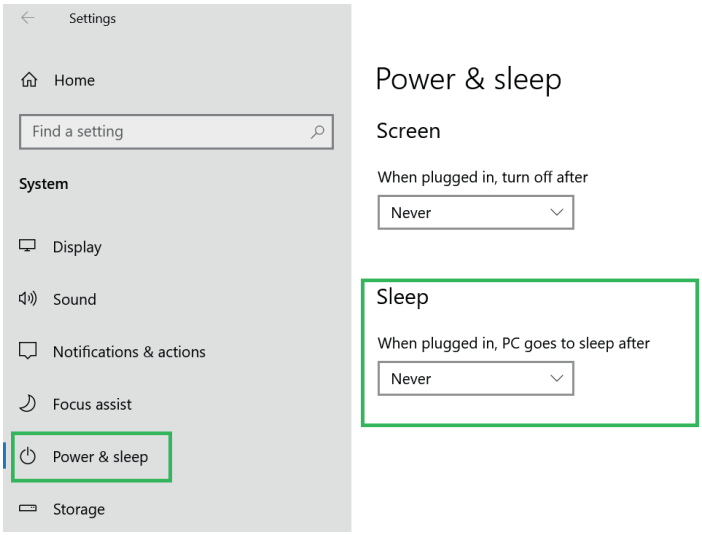
Figure 89: Launch the VNC Application



Note:

1. The remote connection to RXi HMI cannot be done if the device is in sleep mode. The user needs to awake the RXi HMI or set the Sleep to Never as shown below.

Figure 90: Sleep Configuration



2. It is required to launch VNC Server after the RXi HMI device reboots.
3. The UAC (User Account Control) dialog prompts on RXi HMI will close the VNC Connection.

Section 7: Image Recovery

7.1 Recovery/Upgrade Image

Image Recovery Solution (RCV) can be used to restore/reset a Windows installation on a unit initially delivered with a preloaded Windows image that is not able to boot any longer. This can also be used to upgrade to the new Major version of RXi HMI.

7.2 Create a Bootable USB Flash Device

This outlines the steps necessary to create a bootable USB flash device and copy Windows PE for Windows image deployment to it.

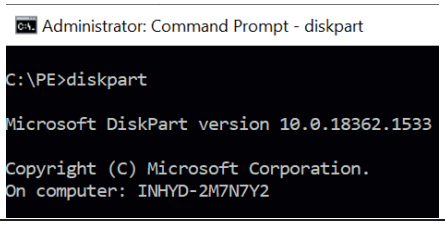
Note: Use FAT32 type USB Flash Drive that is between 8 and 32 GB.

1. Stick Insertion, Console Window

Insert USB device and open a command window. Use **Run as administrator** if you work on a system with UAC active. Alternatively, you can choose to open a non-elevated console window. This will cause the UAC dialog when you call the diskpart utility in the next step.

2. At the console prompt enter: **Diskpart**
3. Enter: List **Disk** to list the disks to identify the CORRECT disk number corresponding to your USB stick

Figure 91: List Available Disks



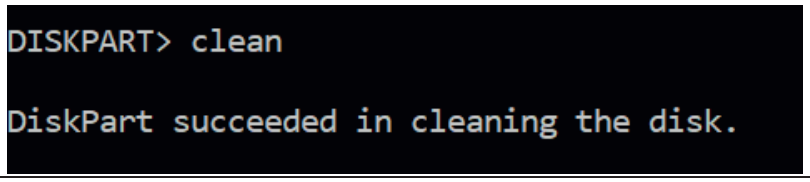
4. Identify and select the disk inserted in step 1.

Figure 92: Select Disk

```
DISKPART> select disk 1

Disk 1 is now the selected disk.

DISKPART> list disk

  Disk ###  Status         Size     Free     Dyn  Gpt
  --------  -------------  -------  -------  ---  ---
  Disk 0    Online          238 GB  2048 KB        *
* Disk 1    Online           28 GB      0 B
```

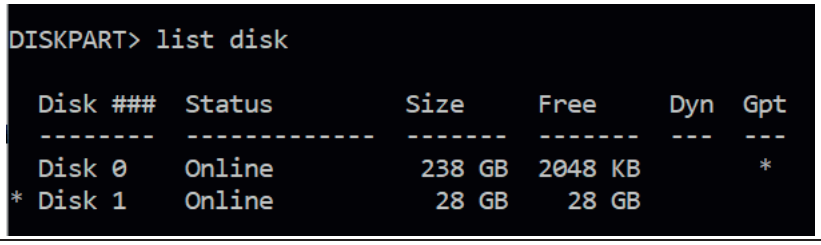
5. Erase your USB stick.

Figure 93: Erase Disk



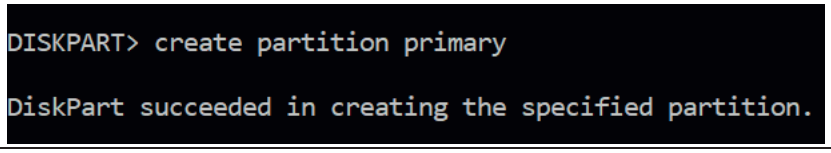
6. Enter **list disk** to verify the free space on your disk.

Figure 94: Verify Disk Free Space



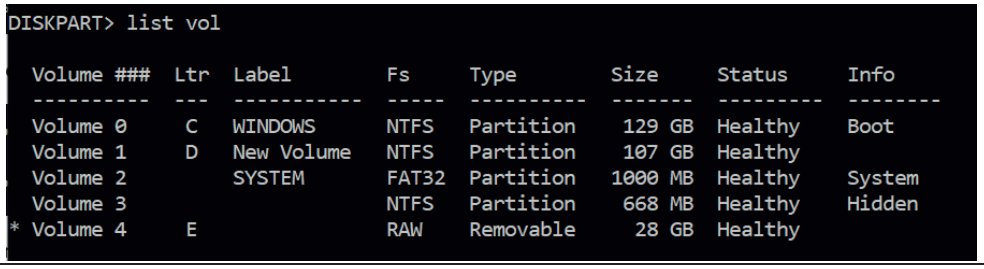
7. Enter **create a partition primary** to create a primary partition.

Figure 95: Create Primary Partition



8. Check the volumes and be sure the partition you selected is already selected (noted by the asterisk '*'). Otherwise, issue the command **select vol 4** (in this case).

Figure 96: Select Partition



9. Issue command **format fs=fat32 label=RecoveryUSB quick** to format the selected volume/partition.

Note that specifying a label for the partition is optional but recommended. Also, note that specifying the "quick" option can be used for quick format.

Figure 97: Partition Completed

```
DISKPART> format fs=fat32 label=RecoveryUSB quick

  100 percent completed

DiskPart successfully formatted the volume.
```

10. Issue command **list vol** to check volumes

Figure 98: Check Volumes

```
DISKPART> list vol

  Volume ###  Ltr  Label        Fs     Type        Size     Status     Info
  ----------  ---  -----------  -----  ----------  -------  ---------  --------
  Volume 0     C   WINDOWS      NTFS   Partition    129 GB  Healthy    Boot
  Volume 1     D   New Volume   NTFS   Partition    107 GB  Healthy
  Volume 2         SYSTEM       FAT32  Partition   1000 MB  Healthy    System
  Volume 3                      NTFS   Partition    668 MB  Healthy    Hidden
* Volume 4     E   RECOVERYUSB  FAT32  Removable     28 GB  Healthy
```

11. Use the **assign** command to assign a drive letter.

This step is necessary only if a drive letter is not already assigned. (For example, Step 8 did not display a proper drive letter for the newly created volume.) Note that the assigned command may interfere with current network drive mappings in case a spare drive letter cannot be found below the first drive letter corresponding to a network share. If a drive letter is already assigned you may omit this step. In this case, use for subsequent steps the drive letter already assigned.

Figure 99: Assign drive letter

```
DISKPART> assign

DiskPart successfully assigned the drive letter or mount point.
```

12. Check the assignation with the **list vol** command.

Figure 100: Verify the Drive Letter Assignation

```
DISKPART> list vol

  Volume ###  Ltr  Label        Fs     Type        Size     Status     Info
  ----------  ---  -----------  -----  ----------  -------  ---------  --------
  Volume 0     C   WINDOWS      NTFS   Partition    129 GB  Healthy    Boot
  Volume 1     D   New Volume   NTFS   Partition    107 GB  Healthy
  Volume 2         SYSTEM       FAT32  Partition   1000 MB  Healthy    System
  Volume 3                      NTFS   Partition    668 MB  Healthy    Hidden
* Volume 4     F   RECOVERYUSB  FAT32  Removable     28 GB  Healthy
```

13. Enter **Exit** to exit the diskpart.

Figure 101: Exit Drive Partition

```
DISKPART> exit

Leaving DiskPart...

C:\PE>
```

7.3 Copy the Windows PE Image

1. Copy the file/directory structure below the Contents folder (i.e. not the Contents folder itself) to the USB stick. You can issue a console command or do this in the GUI (Explorer, Total Commander). The example command is in Figure 102.

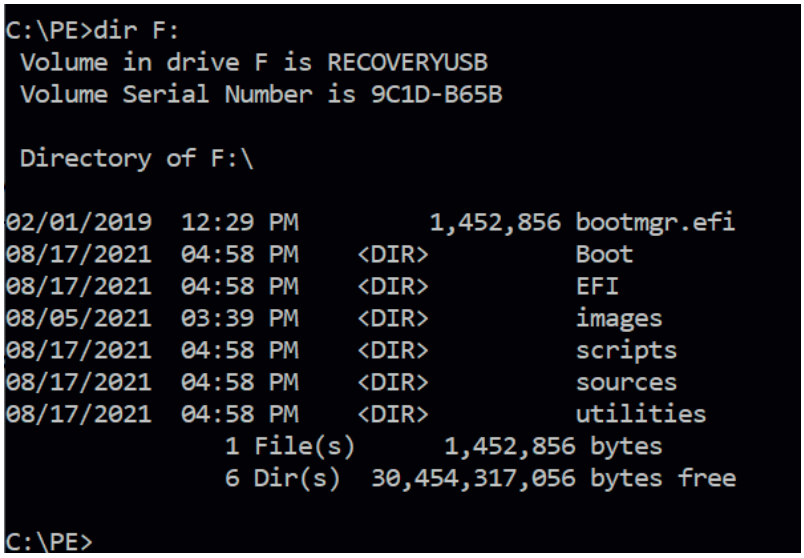
   Note: The number of files copied in this step may vary depending on how many files are actually in the Contents folder of the environment which you copy. There may be a difference due to the number of files in the utilities or/and the images folder.

Figure 102: Copy the Image

```
C:\PE>dir F:
 Volume in drive F is RECOVERYUSB
 Volume Serial Number is 9C1D-B65B

 Directory of F:\

File Not Found

C:\PE>xcopy Contents\*.* /s /e F:
```

```
Contents\bootmgr.efi
...
Contents\sources\boot.wim
...
xxx File(s) copied
```

Figure 103: Contents Copied Successfully



2. Copy the Recovery Image(s) (RXi_Win10_2019_ HMI_rxxx.swm to the images folder. These are typically .swm-files or a .wim-file.
3. Eject and remove the WinPE USB stick just created.

7.4 Install the Windows 10 Recovery/Upgrade Image

This describes, in brief, the installation of the Windows 10 Recovery Image on RXi HMI.

1. Create a bootable USB Flash Device as described in Section 7.2, *Create a Bootable USB Flash Device*. Use a USB Stick that is between 8 and 32 GB in size.
2. Insert the bootable USB Flash Device into the RXi HMI.
3. Power on the RXi HMI and enter the UEFI setup by pressing F2 or Del right after the keyboard LEDs are lit.
4. Set the date and time. This is important for correct Windows operation and later reference.
5. Exit UEFI setup saving the changes and enter the boot device selection dialog: press F7 during the boot sequence as soon as the KBD LEDs are lit.
6. Select the boot entry named **UEFI: <Your UFD>** and press Enter. The graphics displayed during system startup may look a bit scrambled, but this is not of any importance.
7. A console window opens. Enter **go** at the user prompt if you are sure you want to proceed.
8. It will back up the license files [**License.json, License. sig**] from the hardware unit where the recovery image is getting installed to the bootable USB device.
9. The image installation will execute by applying the image to the hardware unit.
10. It will restore the license files [**License.json, License.sig**] to the hardware unit from the bootable USB device. After restored License files are deleted from the bootable USB device. A system restart will occur.
11. Windows will initialize and finally end up at the Windows Welcome screen. In case the system cannot start due to an invalid boot entry repeat Steps 5 and 6 and select **Windows Boot Manager**.

7.5 Movicon WebHMI Licensing

The preloaded Movicon WebHMI on RXi HMI is licensed by Default. During the installation of the Recovery/Upgrade image Movicon WebHMI licensing depends on 2 scenarios.

7.5.1 Scenario 1: Windows File System Accessible

The Movicon WebHMI license will be backed up to a Windows PE bootable USB device from the hardware unit during the installation of Recovery/Upgrade Image. After the installation of the Image Movicon WebHMI License is restored to the hardware unit from the Windows PE bootable USB device.

7.5.2 Scenario 2: Windows File System Corrupted

If the Windows file system is corrupted, then the user will be shown the error Message: **License.json and License.sig files couldn't be found on the device during backing up the licensing from the Hardware unit. Please contact technical support for License files after Image Recovery**.

Once the recovery/upgrade image is installed on RXi HMI then once again error Message will be shown to the user: **License.json and License.sig files couldn't be restored to the Hardware unit. Please contact technical support for License files after Image Recovery".**

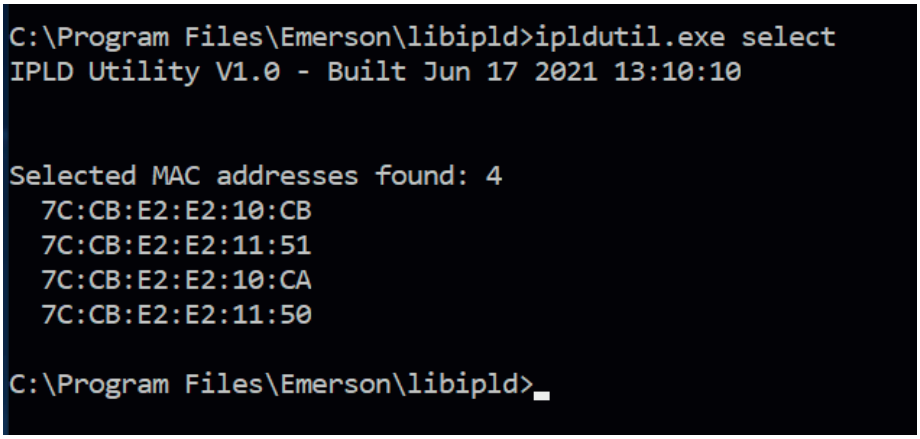
The user should follow the instructions outlined in Section 7.6, *Obtaining License Files*.

7.6 Obtaining License Files

The customer needs to follow the below steps to collect the License Files from the technical support team.

1. The customer needs to get the Hardware MAC address and sent it to the technical support team for generating the License.
2. Launch CMD and change the directory to "**C:\Program Files\Emerson\libipld**" on the RXi HMI Hardware unit.
3. Run the command: **ipldutil.exe select**

Figure 104: Run ipldutil.exe select



4. Copy any Mac Address as generated in Step 3 and send it to the Technical Support Team.
5. The customer needs to copy the obtained **License.json and License.sig files** from the Techincal Support team to *C:\ProgramData\Emerson\libipld* on RXi HMI Hardware unit.

Section 8: Accessing the BIOS

8.1 BIOS Settings

8.1.1 Accessing the BIOS (RXi HMI)

The BIOS is a program that handles basic levels of communication between the CPU and peripherals. It contains codes for various advanced features found in this system board. The BIOS allows you to configure the system and save the configuration in a battery-backed CMOS so that the data is retained even when the power is off. In general, the information stored in the CMOS RAM of the EEPROM will stay unchanged unless a configuration change has been made, such as a hard drive replaced or a device has been added.

The CMOS battery can fail over time, causing CMOS data loss. If this happens, you need to install a new CMOS battery and reconfigure the BIOS settings.

Keys	Function
Right and Left arrows	Moves the highlight left or right to select a menu.
Up and Down arrows	Moves the highlight up or down between submenu or fields.
Enter	Press **Enter** to enter the highlighted submenu or item.
+ (plus key)	Scrolls forward through the values or options of the highlighted field.
- (minus key)	Scroll backward through the values or options of the highlighted field.
<F1>	Displays general help
<F2>	Pervious values
<F3>	Load Optimized Defaults
<F4>	Saves and resets the setup program.
<Esc>	Exit to the BIOS Setup Utility.

Submenu

When "□" appears on the left of a particular field, it indicates that a submenu that contains additional options is available for that field. To display the submenu, move the highlight to that field and press **Enter**.

AMI BIOS Setup Utility (RXi HMI)

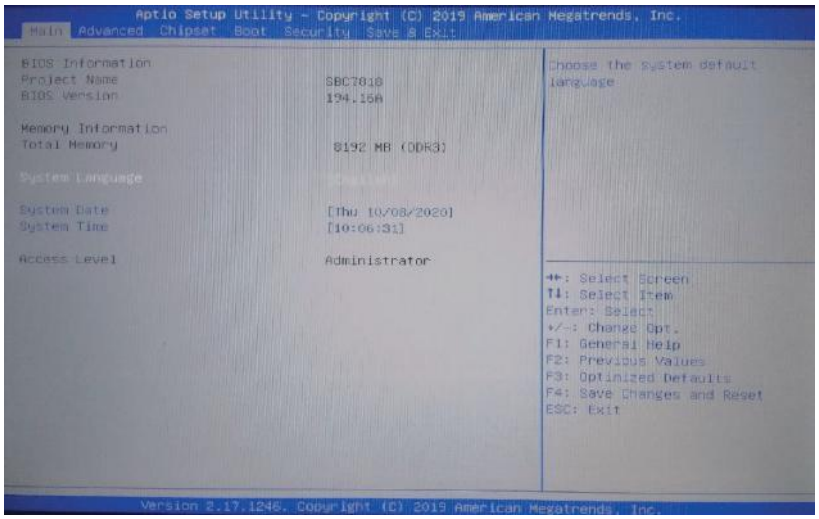
Accessing the BIOS

To access the BIOS, you must attach a USB keyboard to the device and repeatedly press the **Delete** key during the startup sequence until it brings you to the BIOS Main Menu.

Main Menu

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.

Figure 105: Main Menu

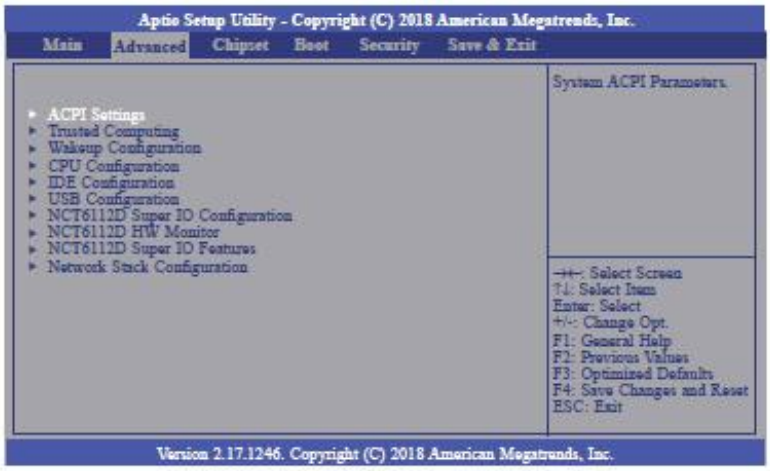


BIOS Parameter	Description
System Language	Choose the system default language.
System Date	The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from 01 to 12. Date displays the date, from 01 to 31. Year displays the year, from 1980 to 2099.
Time	The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others if enabled, will improve the performance of your system or allow the user to set some features according to their preference.

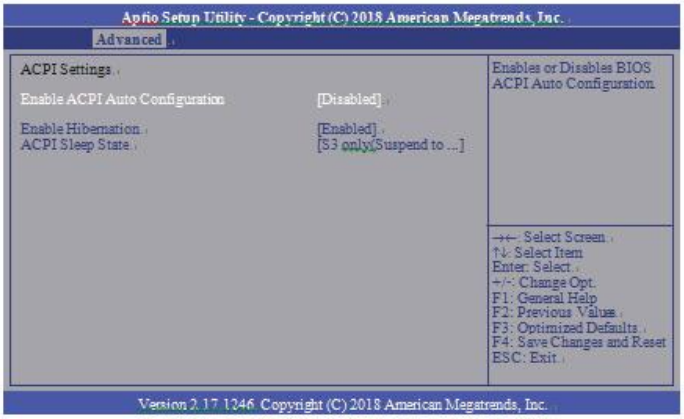
Figure 106: Advanced Menu



ACPI Settings

This section configures system ACPI parameters.

Figure 107: ACPI Settings

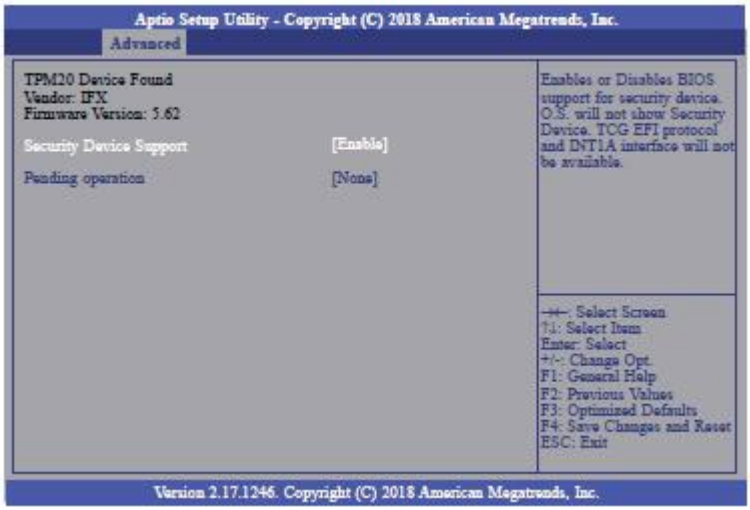


BIOS Parameter	Description
ACPI Auto Configuration	This field is used to enable or disable BIOS ACPI auto configuration.
Enable Hibernation	This field is used to enable or disable the system's ability to hibernate (OS/S4 Sleep State). This option may not be functional with all operating systems.

Trusted Computing

This section is used to configure the Trusted Computing settings.

Figure 108: Trusted Computing

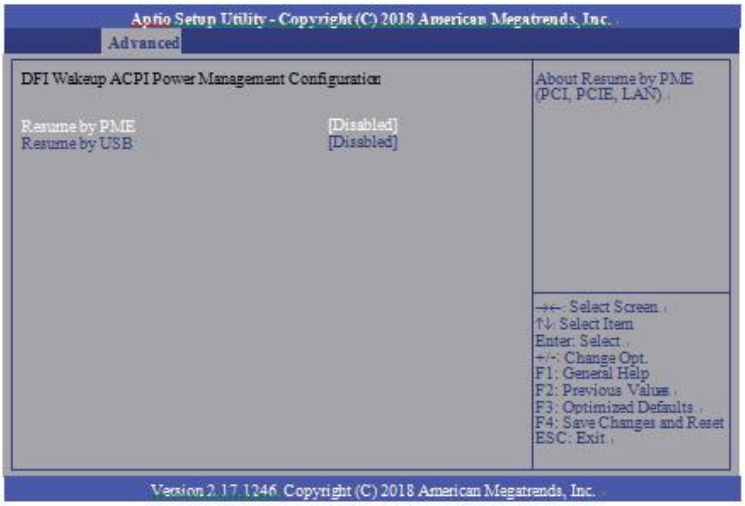


BIOS Parameter	Description
Security Device Support	Enable or disable BIOS support for a security device. The Operating System will not show a security device. TCG EFI protocol and INT1A interface will not be available.
Pending Operation	Schedule an operation for the security device. Your computer will reboot during restart to change the state of the security device.

Wakeup Configuration

This section is used to configure the Wakeup ACPI Power Management.

Figure 109: Wakeup Configuration

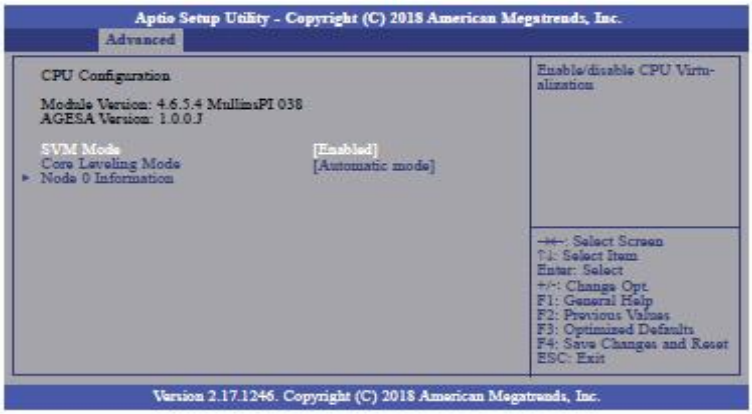


BIOS Parameter	Description
Resume by PME	Enable or disable to resume by PME (PCI, PCIe, LAN, etc.)
Resume by USB	This is enabled by default. Enable or disable to resume by USB.

CPU Configuration

This section is used to configure the CPU. It will also display the detected CPU information.

Figure 110: CPU Configuration

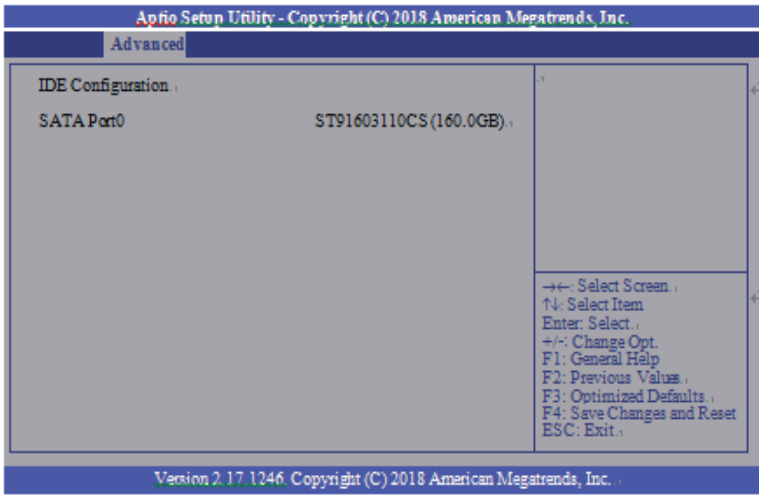


BIOS Parameter	Description
SVM Mode	Enable or disable CPU Virtualization.
Core Leveling Mode	Select the number of cores in the system: Automatic mode, Three cores per processor, Two cores per processor, or One core per processor.
Node 0 Information	View Memory Information related to Node 0.

IDE Configuration

This section is used to configure the IDE Devices. It will also display the detected information.

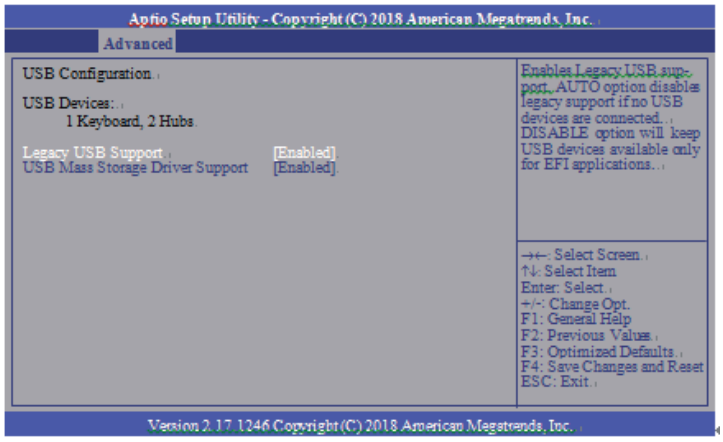
Figure 111: IDE Configuration



USB Configuration

This section is used to configure the parameters of the USB Device.

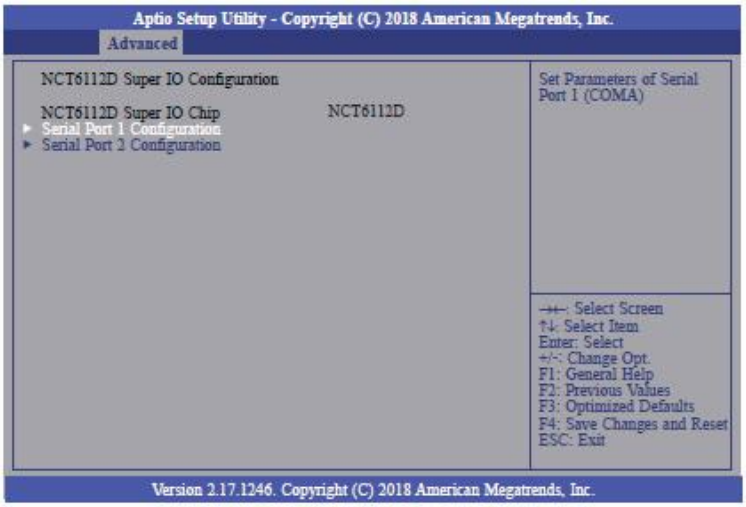
Figure 112: USB Configuration



BIOS Parameter	Description
Legacy USB Support	**Enabled** – Enabled Legacy USB **Disabled** – Keep USB devices available only for EFI applications **Auto** – Disable support for legacy when no USB devices are connected
USB Mass Storage Driver Support	Enable or disable the support of the USB Mass Storage Driver.

NCT61120 Super IO Configuration

This section is used to configure the parameters of the system super IO chip.

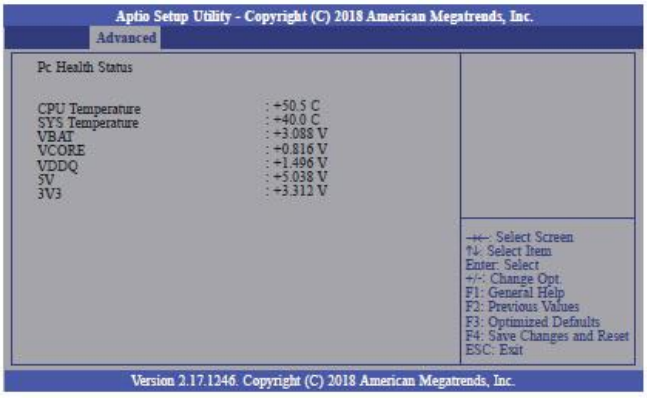


BIOS Parameter	Description
Serial Port	Enable or disable the serial COM port.
RS485 Auto Flow Support	Enable or disable the RS485 auto flow support.

NCT 6112D HW Monitor

This section is used to monitor hardware status.

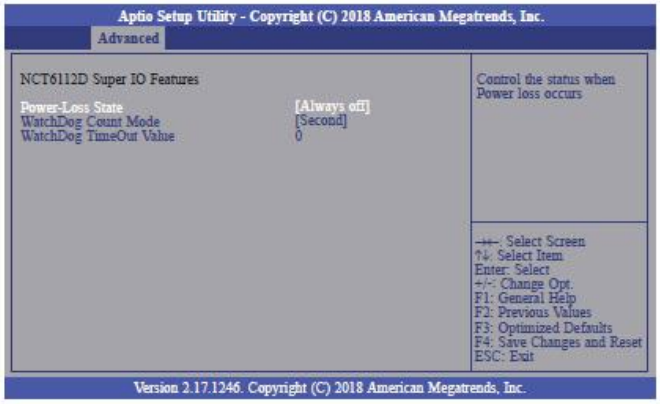
Figure 113: NCT6112D Hardware Monitor



NCT 6112D Super IO Features

This section is used to configure some control functions of the system super IO chip.

Figure 114: NCT 6112D Super IO Features

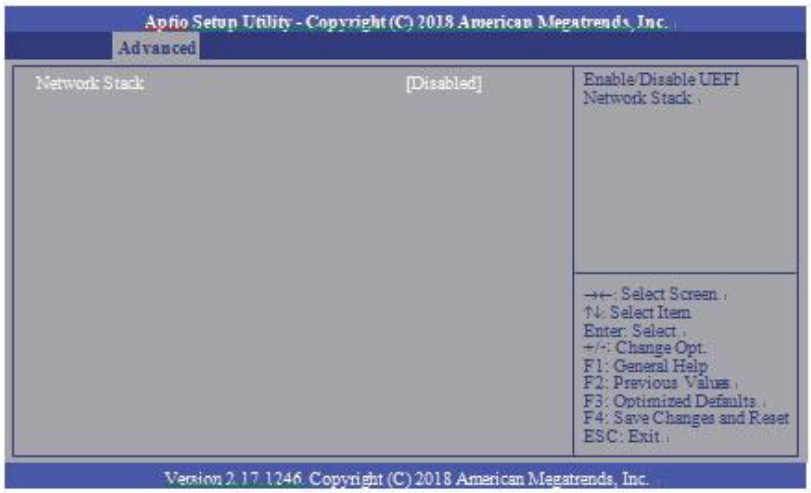


BIOS Parameter	Description
WatchDog Count Mode	A WatchDog timer (WDT) is a hardware timer that automatically generates a system reset if the main program neglects to periodically service it. It is often used to automatically reset an embedded device that hangs because of a software or hardware fault. Use this menu to select the WatchDog Timer Unit: second or minute.
WatchDog TimeoutValue	Enter the value to set the Super IO WatchDog timer. 0 means disabled.

Network Stack Configuration

This section is used to enable or disable network stack settings. The Network Stack Controls LAN1 & LAN2 (Also LAN 3 & LAN4 on large computing module).

Figure 115: Network Stack Configuration

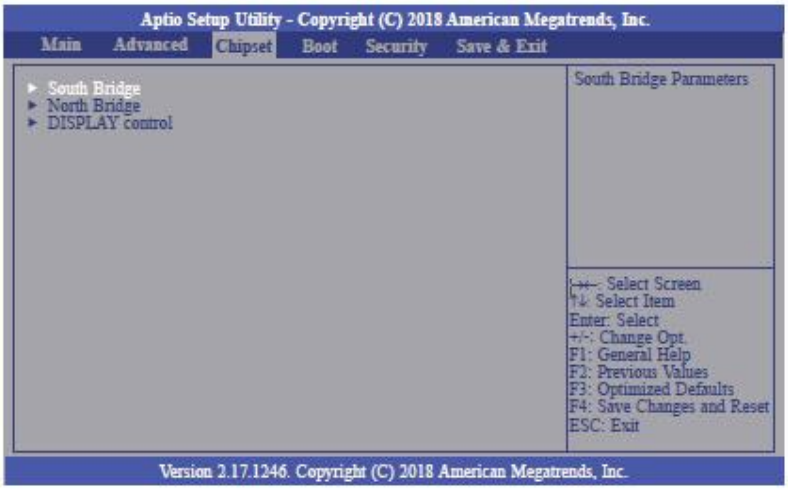


BIOS Parameter	Description
Network Stack	Enable or disable the UEFI network stack. When Network Stack is set to enabled, the screen will be displayed as below.
Ipv4 PXE Support	When enabled, Ipv4 PXE boot supports. When disabled, the Ipv4 PXE boot option will not be available.
Ipv6 PXE Support	When enabled, Ipv6 PXE boot supports. When disabled, the Ipv6 PXE boot option will not be available.
PXE Boot Wait Time	Enter the wait time value to abort the PXE boot.
Media Detect Time	Enter the wait time in seconds to detect media.

Chipset

This section configures relevant chipset functions.

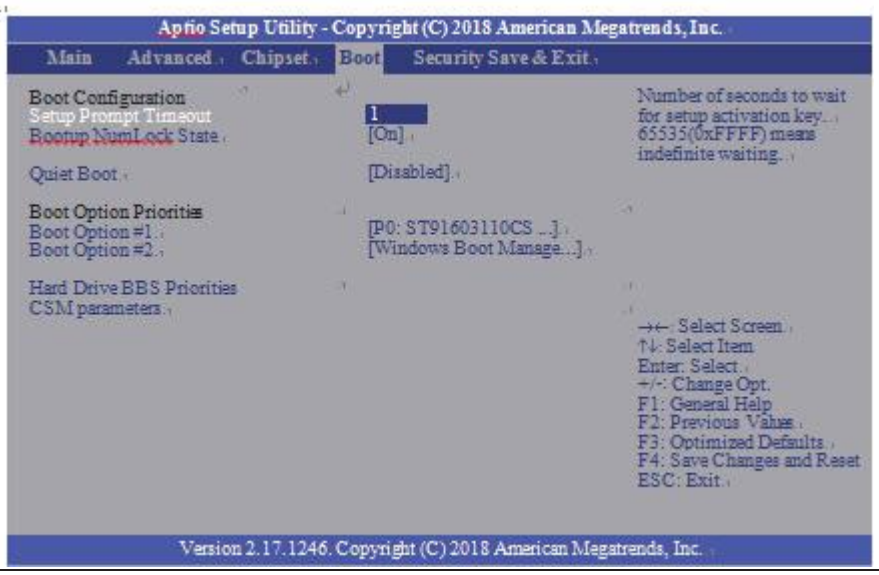
Figure 116: Chipset Screen



BIOS Parameter	Description
OnChip SATA Channel	Enable or disable Serial ATA
OnChip SATA Type	Select OnChip SATA Type: Native IDE, AHCI, or Legacy IDE.
SD Mode	Enable or disable Secure Digital (SD) Mode configuration.
SD Host Controller Version	Select Secure Digital (SD) host controller version: SD2.0 or SD3.0.
HD Audio	HD Audio will be enabled if present, disabled otherwise.
Restore on AC Power Loss	**Power On –** When Power returns after an AC power failure, the system will automatically power on.
	Power Off - When power returns after an AC power failure, the system will remain off. You must press the Power button to power on the system.
	Last State - When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power on when power returns.
GPP2 Hotplug Mode Control	Enable or Disable GPP2 Hotplug Mode Control
GPP3 Hotplug Mode Control	Enable or disable GPP3 hotplug mode control.
DP0 Output Mode	Select NB PCIe to connect type (display device): EDP or Disabled.
Dp1 Output Mode	Select NB PCIe connect type (display device): DP or Disabled
Auto Backlight Dimming	This is by default enabled. Enable or disable dimming backlight by TB573D.
Minimum Dimming Level	Set the minimum dimming level control. The range is 1~20%.

Boot Configuration

Figure 117: Boot Configuration Menu

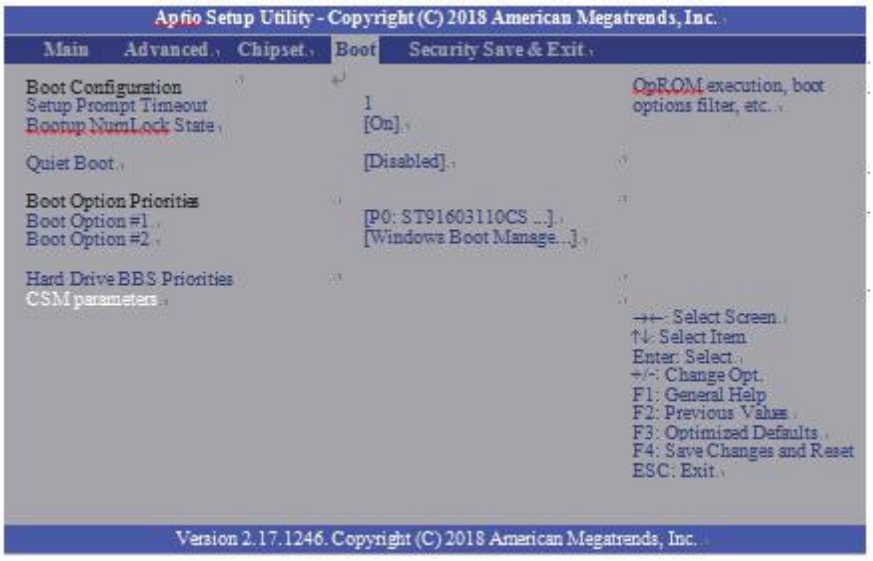


BIOS Parameter	Description
Setup Prompt Timeout	Select the number of seconds to wait for the setup activation key. 65535(0xFFFF) denotes indefinite waiting.
Bootup NumLock State	This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.
Quiet Boot	Enable or disable the Quiet Boot option.
Boot Option #1/#2	Select the system boot order.

Hard Drive BBS Priorities

Set the order of the legacy devices in this group.

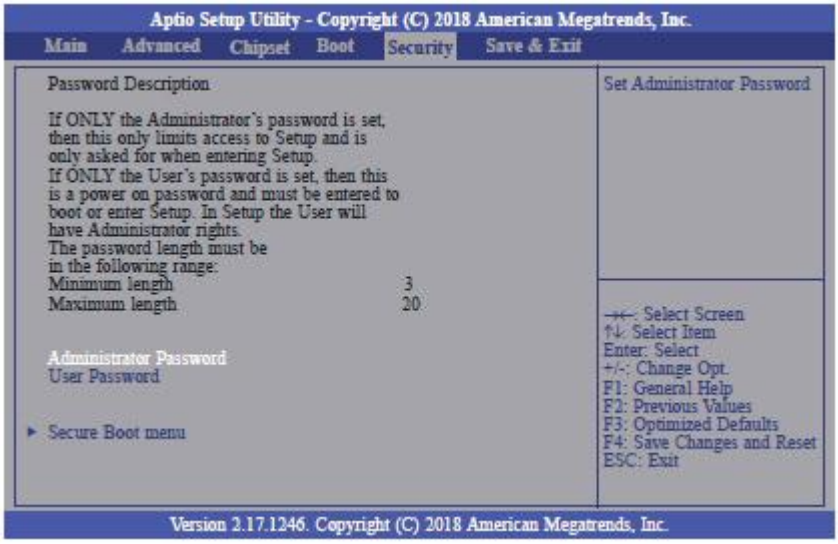
Figure 118: Hard Drive BIOS Boot Specification



BIOS Parameter	Description
Launch CSM	This field is used to enable or disable to launch of CSM.
Boot Option Filter	This option controls what device(s) the system will boot to.
Launch PXE OpROM Policy	This field controls the execution of UEFI and Legacy PXE OpROM.
Launch Storage OpROM Policy	This field controls the execution of UEFI and Legacy Storage OpROM.
Launch Video OpROM Policy	This field controls the execution of UEFI and Legacy Video OpROM.

Security

Figure 119: Security

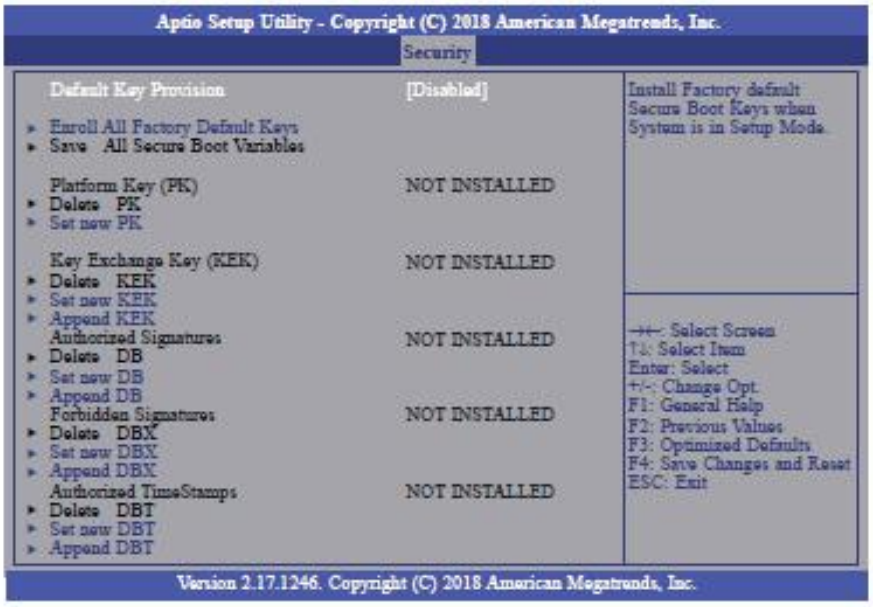


BIOS Parameter	Description
Administrator Password	Set the administrator password.
User Password	Set the user password.
Secure Boot Menu	This section is used to configure customizable secure boot settings.
Secure Boot	Enable or disable secure boot. Secure Boot can be enabled if 1. System running in user mode with enrolled platform key (PK); 2. CSM function is disabled.
Secure Boot Mode	Select secure boot mode: standard or custom. Custom mode enables users to change image execution policy and manage secure boot keys.

Key Management

This section enables experienced users to modify secure boot variables.

Figure 120: Key Management

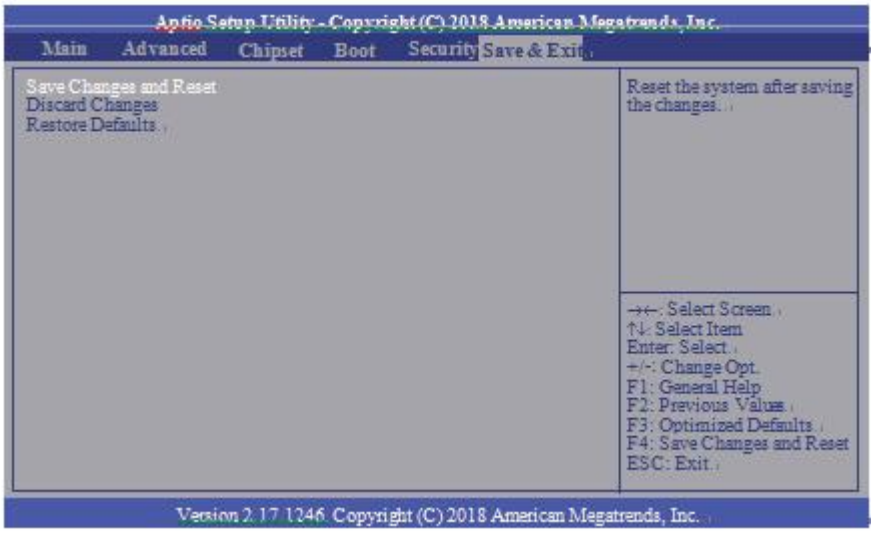


BIOS Parameter	Description
Default Key Provision	Enable or disable to install factory default secure boot keys when the system is in setup mode. When enabled, a pop-up window will display. Select **Yes** and press **Enter** to install factory default keys.
Enroll All Factory Default Keys	Select **Yes** and press **Enter** to install ALL factory default keys, including PK, KEK, DB, DBX, and DBT. Change takes effect after reboot.
Set New PK	Select **Yes** and press **Enter** to set a new PK or select **No** and press **Enter** to load it from a file on external media.
Set new KEK	Select **Yes** and press **Enter** to set a new KEK or select **No** and press **Enter** to load it from a file on external media.
Append KEK	Select **Yes** and press **Enter** to set a new KEK or select **No** and press **Enter** to load it from a file on external media.
Set new DB	Select **Yes** and press **Enter** to set a new DB or select **No** and press **Enter** to load it from a file on external media.
Append DB	Select **Yes** and press **Enter** to set a new DB or select **No** and press **Enter** to load it from a file on external media.
Set new DBX	Select **Yes** and press **Enter** to set a new DBX or select **No** and press **Enter** to load it from a file on external media.
Set new DBT	Select **Yes** and press **Enter** to set a new DBT or select **No** and press **Enter** to load it from a file on external media.
Append DBT	Select **Yes** and press **Enter** to set a new DBT or select **No** and press **Enter** to load it from a file on external media.

Save & Exit

Menu Options

Figure 121: Menu Options



BIOS Parameter	Description
Save Changes and Reset	To save the changes, select this field and then press **Enter**. A dialog box will appear. Select Yes to reset the system after saving all changes made.
Discard Changes	To discard the changes, select this field and then press **Enter**. A dialog box will appear. Select Yes to reset the system setup without saving any changes.
Restore Defaults	**Enter**. A dialog box will appear. Select Yes to restore the default values of all the setup options.

Updating the BIOS

To update the BIOS, you will need the BIOS file and a flash utility. Please contact technical support or your sales representative for the files. The contact information is located at the end of this document.

Section 9: Mounting Information

9.1 Panel Mount

The RXi HMI can be panel-mounted.

Panel Thickness: 16[1] to 7 gauge (1.6 to 5 mm)

Panel Thickness: 1.6 to 5mm

All measurements within ±0.5mm

9.1.1 Panel Cutout Dimensions

Figure 122: Panel Cutout Dimensions

Display Size (in)	Width (mm)	Height (mm)
12	317	214.5
15	398	245.5
19	482	297
24	581	360

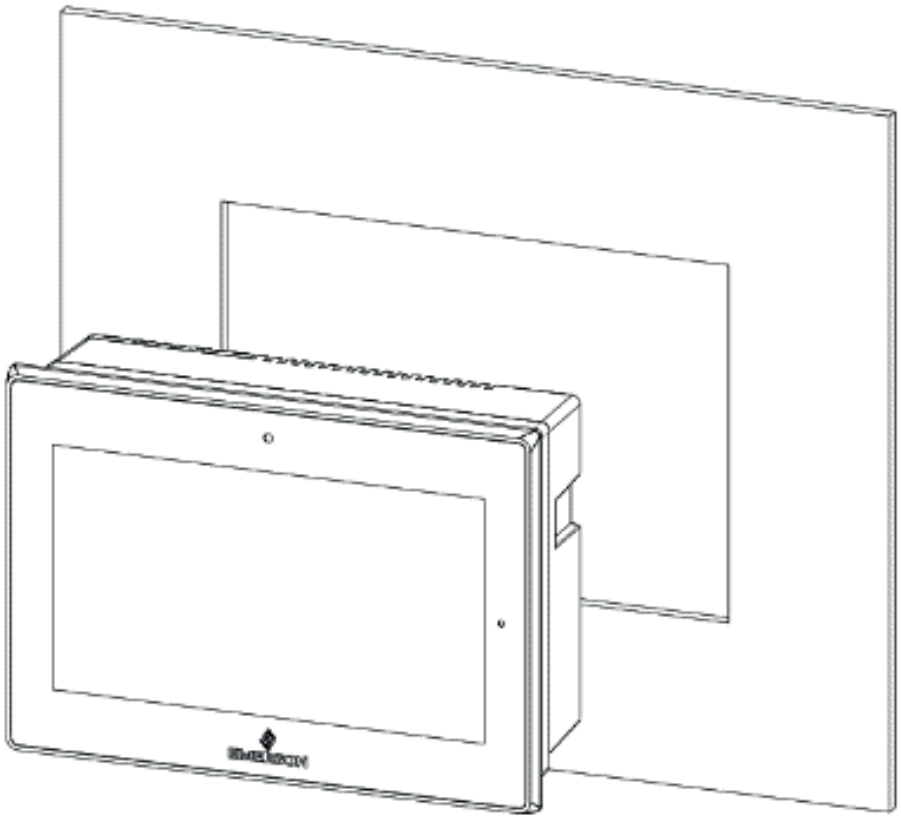
All panel cutout measurements should be within ±0.5 mm.
Values presented are width and height only.

[1] For IP66 installations of 12-inch displays (IC760CSW12CDA) use a 14 to 7 gauge (2 to 5 mm) thick panel.

9.1.2 Installation Steps

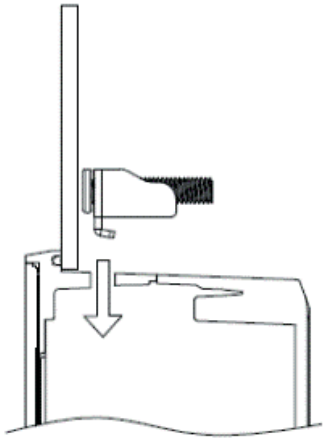
1. Verify that the gasket is present and properly seated in the bezel channel located on the sides of the unit.
2. Carefully insert the RXi HMI into the mounting panel cutout.

Figure 123: Panel Install View



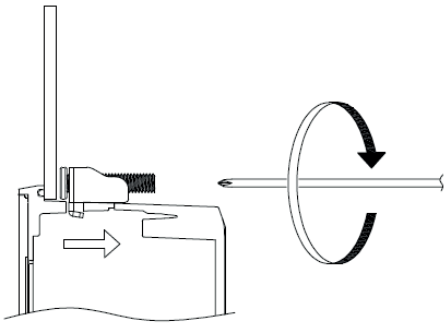
3. Insert the hook of the mounting bracket into the mounting hole as displayed in the following figure.

Figure 124: Mounting Bracket Insertion



4. Tighten all mounting brackets by hand until the gasket seal contacts the mounting surface uniformly.
5. In a cross pattern around the monitor tighten all mounting clip screws to a torque of 13 to 13.9 in-lbs. (15 to 16kgf-cm) making sure not to overtighten the bracket.

Figure 125: Tighten Mounting Bracket



9.2 Mounting to Modular Display

Figure 126: 12" Mount

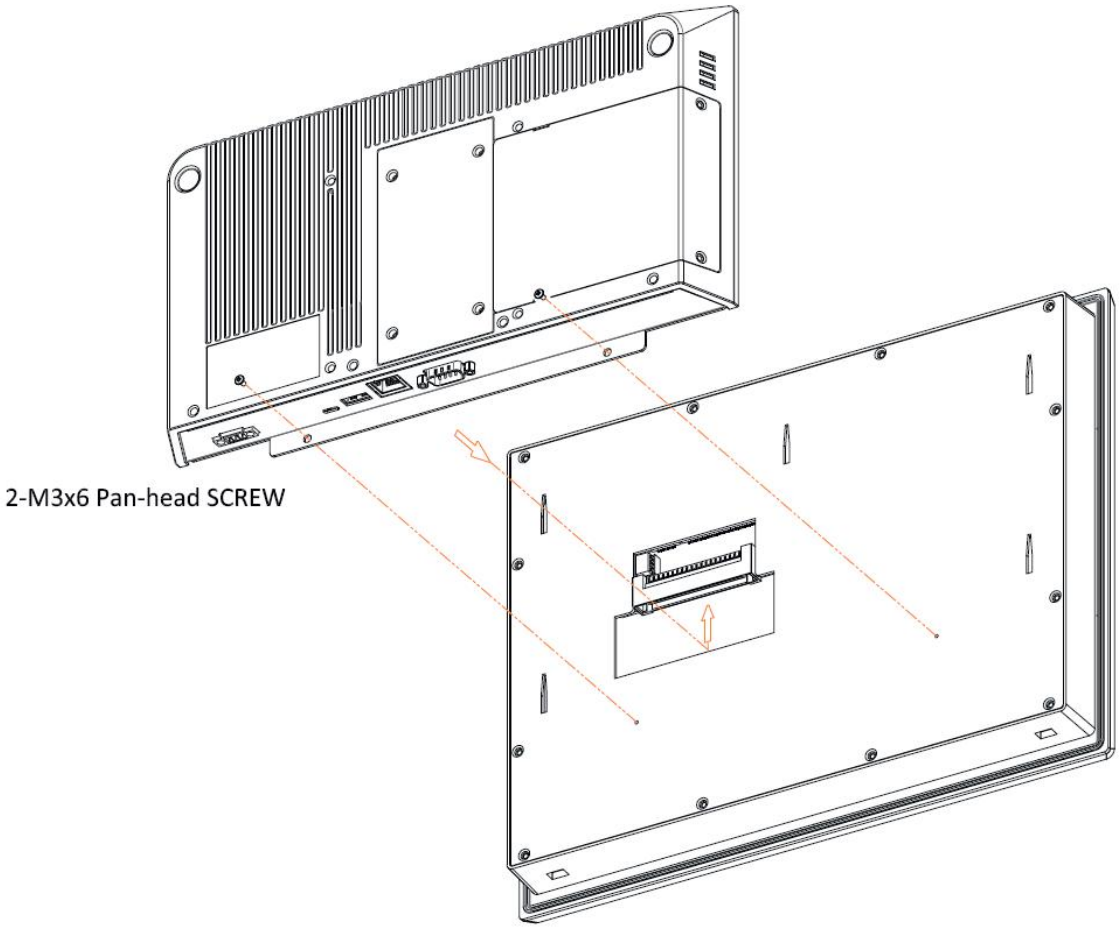


Figure 127: 15" Mount

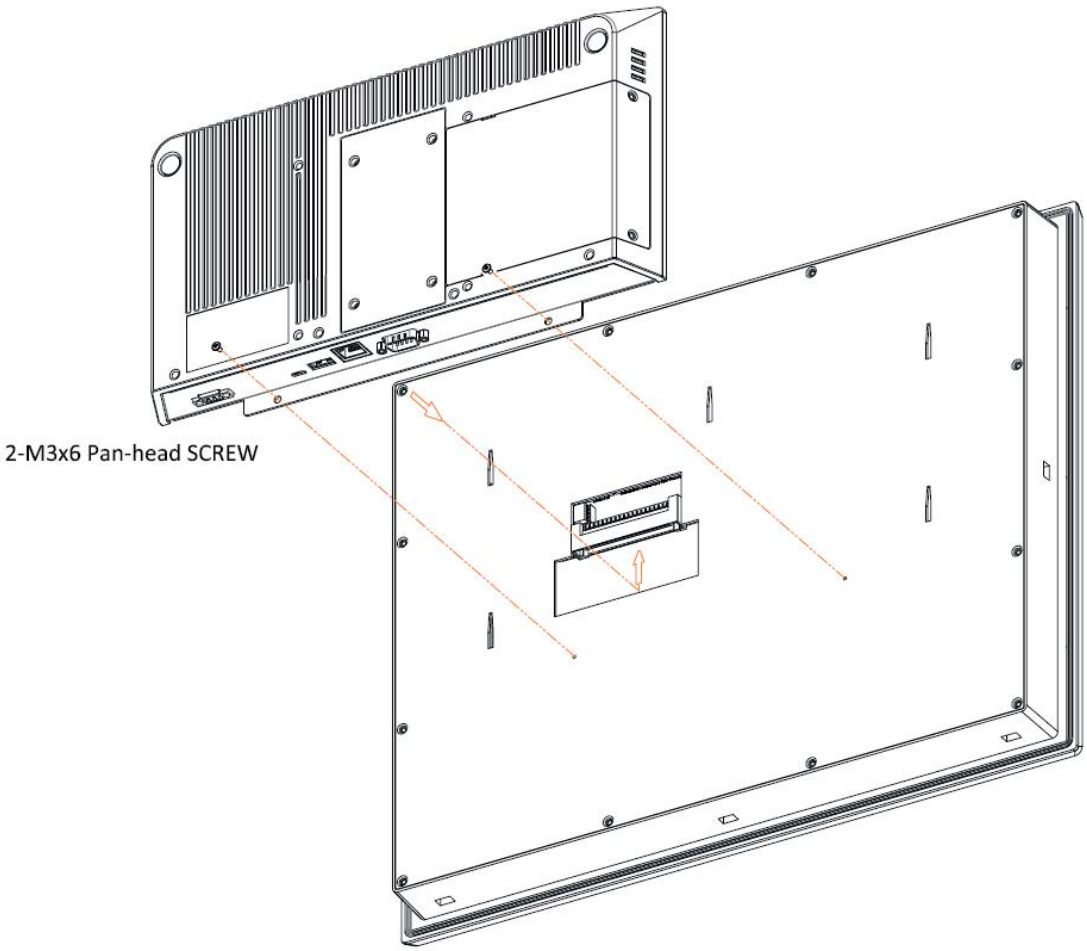
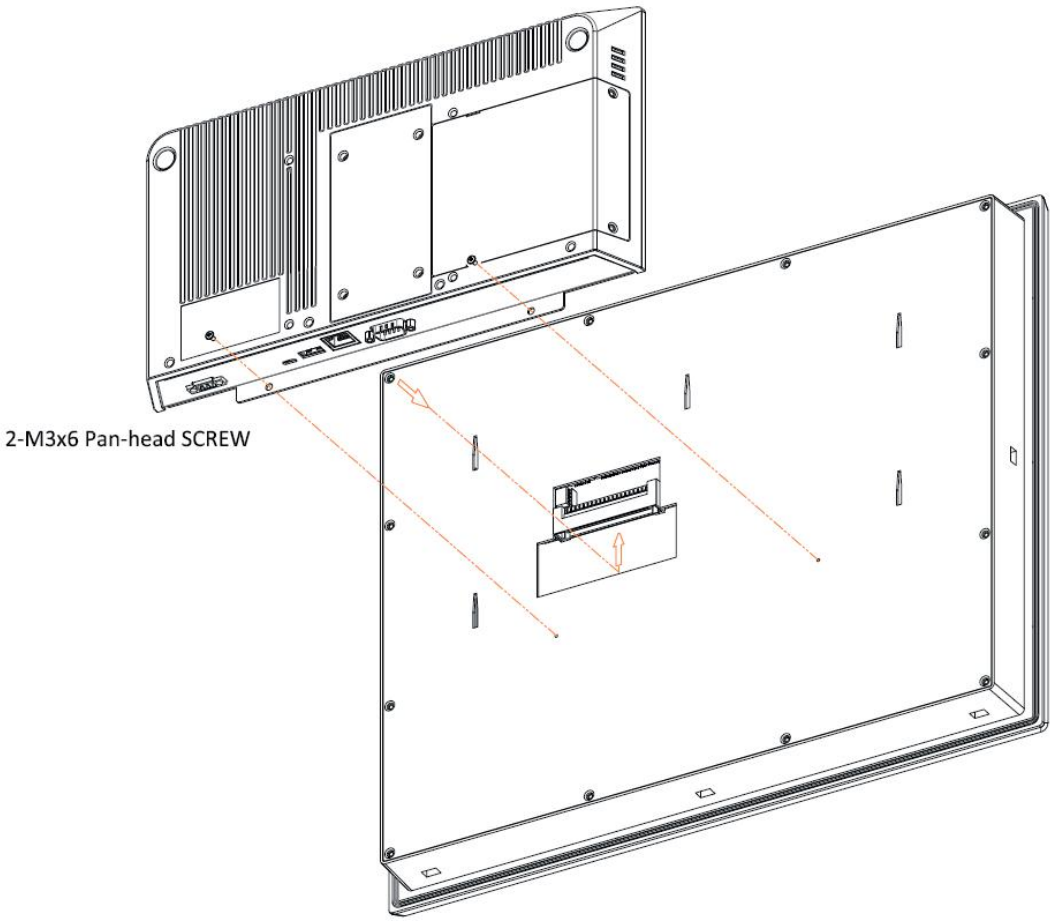


Figure 128: 19/24" Mount



9.3 VESA Mount

9.3.1 VESA Mount Dimensions

The RXi HMI can also be VESA mounted as shown in the figures below. All 12” through 24” units include VESA Mount Dimensions of 100 mm x 100 mm.

All units are fastened with four M4x8 screws.

Figure 129: 12" VESA Mount

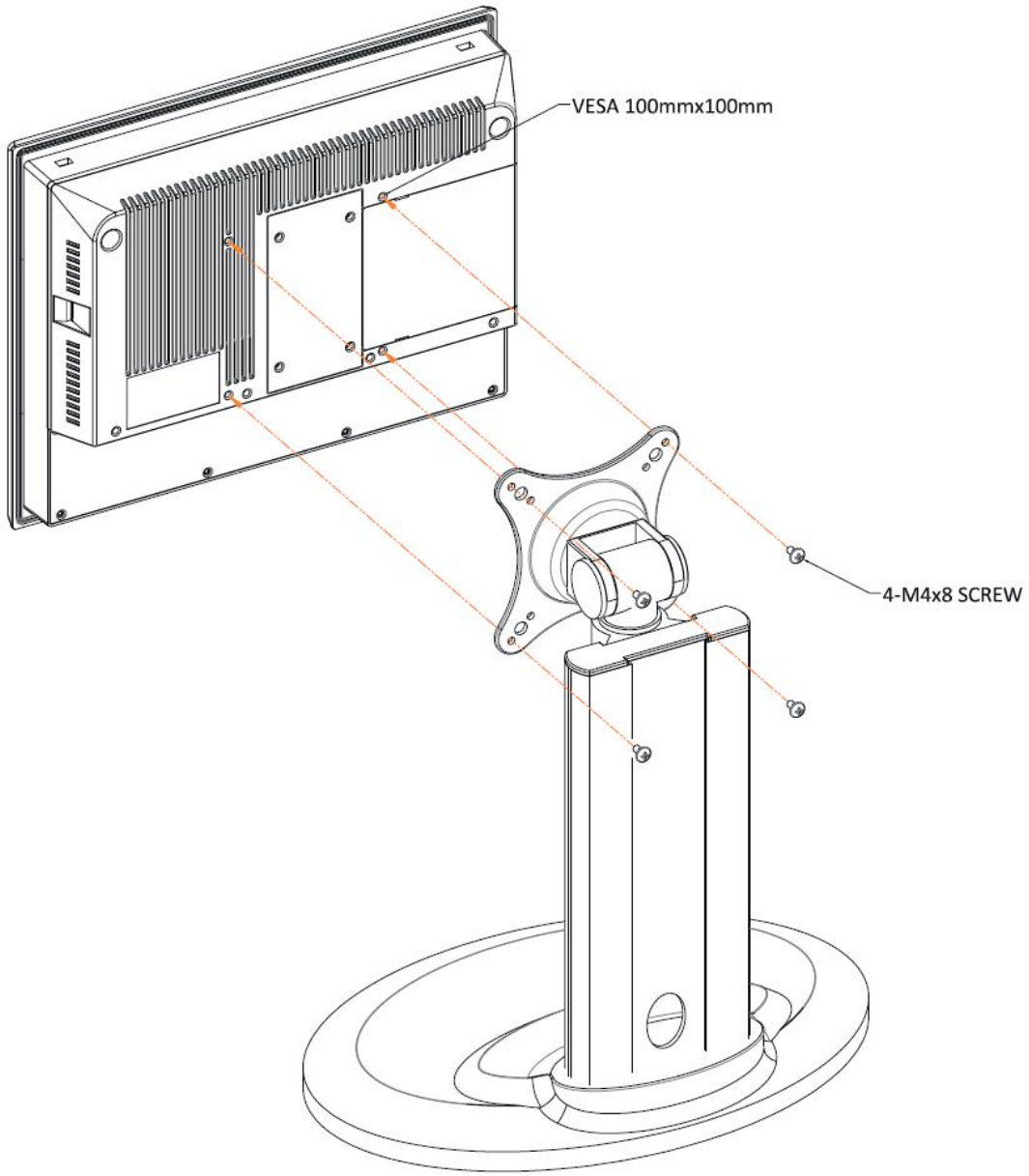


Figure 130: 15" VESA Mount

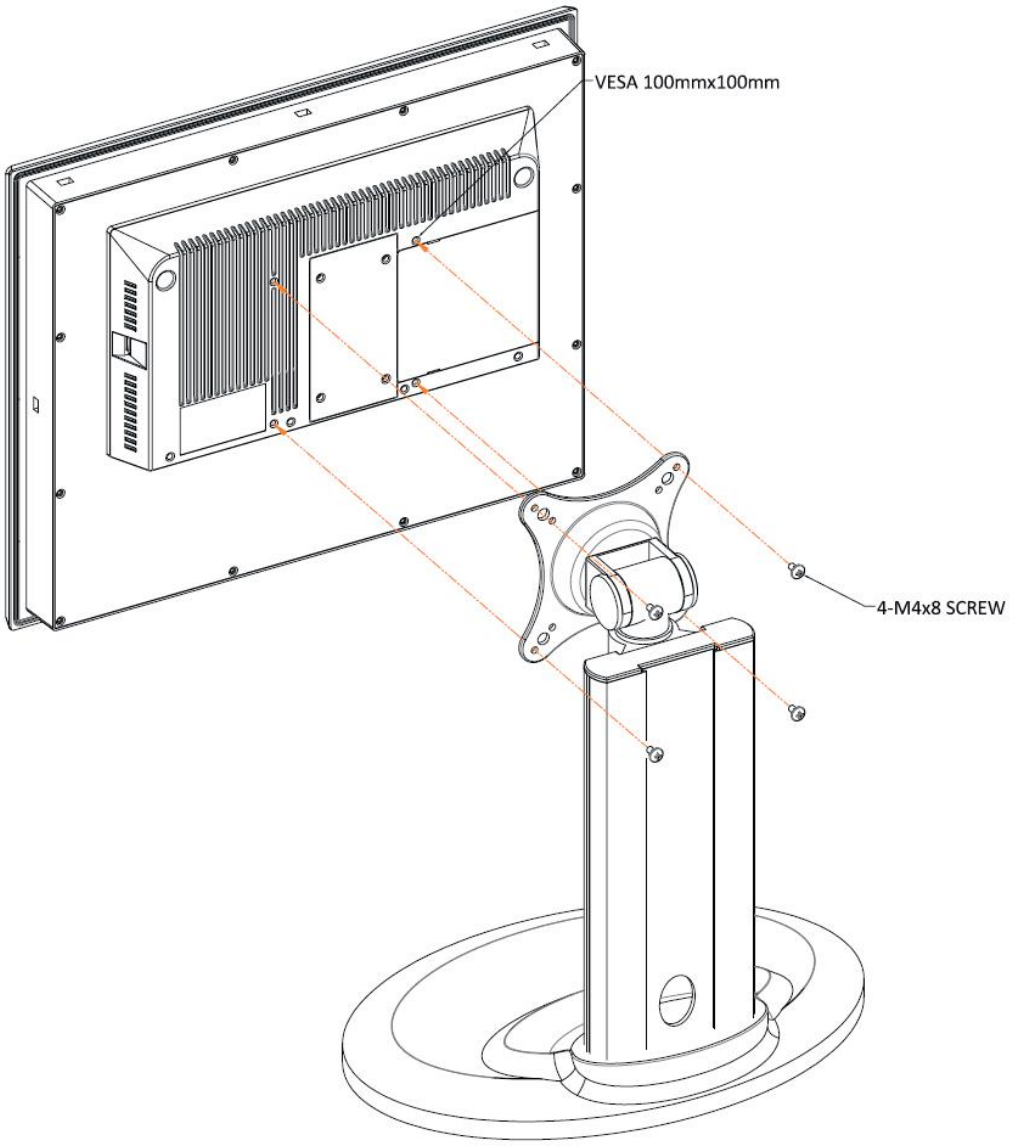
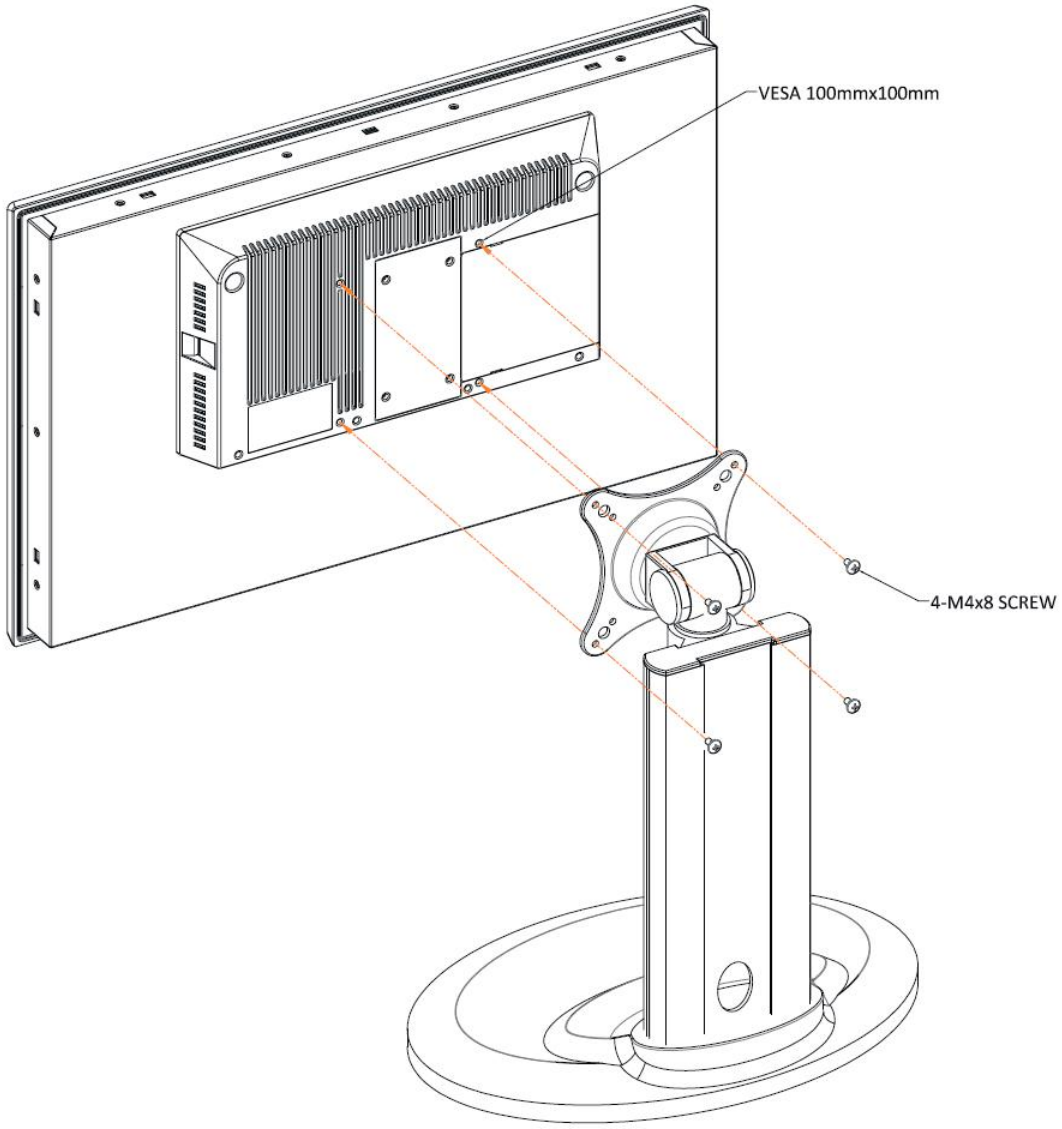


Figure 131: 19"/24" VESA Mount

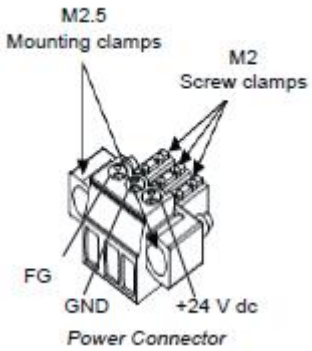


Section 10: Physical Connections and Configuration Settings

Input Power (24V DC-in)

To connect to power, follow these steps:

1. Verify that the power cable is not energized.
2. Loosen the screw clamps on the mating power connector.
3. Strip the insulation from the power cables.
4. Secure the power cable to the mating connector, noting polarity, and tighten the screw clamps. The torque for the attaching screws is 0.3 Nm (2.26 in-lb).
5. Apply dc power to the unit. During normal startup and operation, the LED status indicator displays as follows:
   - Solid amber while the RXi HMI unit is starting up
   - Solid green during normal operation



Power Connector

Be sure to connect a DC power cord to this 3-pin power connector. Using a voltage out of the range may fail to boot the system or cause damage to the system board.

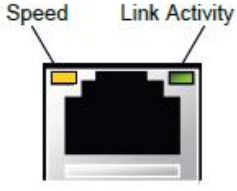
10.1 Graphics Interface

The RXi HMI uses a DisplayPort to connect to a display device such as a computer monitor. The DisplayPort connection will be used to transmit both audio and video. If additional configuration is required, visit the Chipset menu in the device BIOS on startup.

10.2 Ethernet Ports

The RXi HMI has Four Base-T Ethernet Ports. Use the LAN ports to connect to a local area network through a network hub or router. If additional configuration is required, visit the Wakeup Configuration menu in the device BIOS on startup.

10.2.1 Ethernet Port Operation LEDs



LED	LED State	Operating State
Speed	Yellow, ON	10/100/1000
Link Activity	Green, ON	Link Status

10.2.2 Operation Status LEDs (Screen)

RXi HMI has a tri-color LED built into the screen that provides a visual indication of the operation status.

LED State	System State
Amber, Solid	Operating system starting
Green, Solid	Normal operating state
Green, Blinking	Backlight off
Red, Blinking	Backlight failure
Off	Power not applied to the unit

10.3 USBs

The RXi HMI features two USB 2.0 (Type-A) ports for the mouse and keyboard. (There are also two USB 3.0 (Type-A) ports for external storage devices.) If configure the device to wake on keyboard/mouse function visit the Wakeup Configuration menu in the device BIOS on startup.

10.4 Serial Connectors (UART)

The RXi HMI features two serial port connections. Connect these devices using the pin-out configuration seen in

Serial Connection	Pin	Function
RS232	1	TXD
	2	RXD
	3	RTS
	4	CTS
	5	GND
RS485	6	TX+
	7	TX-
	8	RX+
	9	RX-
	10	GND

10.5 I/O Connectors

10.5.1 Serial ATA (SATA) Connector

Features

1 Serial ATA 3.0 port with data transfer rate up to 6Gb/s

Integrated Advanced Host Controller Interface (AHCI) controller

The Serial ATA connector is used to connect the Serial ATA device. Connect one end of the Serial ATA data connector to a SATA connector on the other end to your Serial ATA device.

BIOS Setting

Configure the Serial ATA drive in the Chipset menu (SB SATA Configuration submenu) of the BIOS. Refer to chapter 3 for more information.

10.6 Expansion Slots

10.6.1 Micro SD Socket

The micro SD socket allows you to install a micro SD card for the expansion of available storage.

10.7 LVDS LCD Panel Connector

The system board allows you to connect an LCD Display Panel with the LVDS LCD panel connector. This connector transmits video signals and power from the system board to the LCD Display Panel.

Refer to the right side for the pin functions of the LVDS connector.

10.7.1 BIOS Setting

Configure the LCD panel in the Chipset menu (DISPLAY control submenu) of the BIOS. Refer to Chapter 3 for more information.

10.8 Audio

10.8.1 Rear Audio

The system board is equipped with 2 audio jacks (Line-out and Mic-in). A jack is a one-hole connecting interface for inserting a plug.

- **Line-out Jack (Lime) -** This jack is used to connect a headphone or external speakers.
- **Mic-in Jack (Pink) -** This jack is used to connect an external microphone.

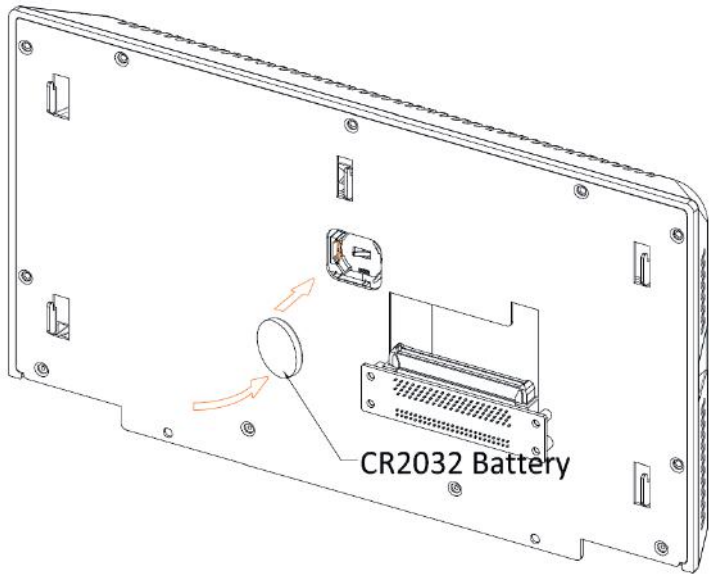
10.9 Battery

The lithium-ion battery powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off or disconnected. It is a standard CR2032 battery and is accessible on the bottom of the computing module when separated from the screen (as shown inFigure 132.

Safety Measures

- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommended by the manufacturer.
- Dispose of used batteries according to local ordinances.

Figure 132: CR2032 Battery for 12 to 24 inch



⚠ WARNING

Use of Another Battery May Present a Risk of Fire or Explosion.

Replace Battery with Panasonic Model CR2032 only.

⚠ CAUTION

Battery May Explode if Mistreated. Do not Recharge, Disassemble, or Dispose of In Fire.

Appendix A Open Source Software Used by RXi HMI

Component Name : JamesNK/Newtonsoft.Json

Version :13.0.1

License information :The MIT License (MIT)

Copyright (c) 2007 James Newton-King

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Component Name: Microsoft.Dism

Version : 2.2.2

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General Contact Information

Home link: http://www.emerson.com/industrial-automation-controls

Knowledge Base: https://www.emerson.com/industrial-automation-controls/support

Technical Support

Americas
Phone: 1-888-565-4155
1-434-214-8532 (If toll free option is unavailable)

Customer Care (Quotes/Orders/Returns): customercare.mas@emerson.com
Technical Support: support.mas@emerson.com

Europe
Phone: +800-4444-8001
+420-225-379-328 (If toll free option is unavailable)
+39-0362-228-5555 (from Italy - if toll-free 800 option is unavailable or dialing from a mobile)

Customer Care (Quotes/Orders/Returns): customercare.emea.mas@emerson.com
Technical Support: support.mas.emea@emerson.com

Asia
Phone: +86-400-842-8599
+65-6955-9413 (All other Countries)

Customer Care (Quotes/Orders/Returns): customercare.cn.mas@emerson.com
Technical Support: support.mas.apac@emerson.com

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