HORNER AUTOMATION GROUP

WebMI User Manual

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Chapter 1: WebMI Overview

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WebMI Introduction

WebMI is a HTML5 based HTTP server, where access to data and visualizations is enabled from anywhere via web clients. WebMI empowers users to control everything onscreen from a computer, tablet, or other mobile device. It is not necessary for the user to create HTTP web pages. The pages are created by Cscape via the Graphic Editor and transferred to the OCS controller's removable media card. This turns the OCS controller into a web server that can be used with most internet browsers. WebMI support requires Cscape 9.70 and Firmware 14.14 at a minimum. It is recommended to use Cscape 9.80 SP2 and Firmware 15.0 and onwards to take advantage of improvements and additional features.

The web pages can be published from either the primary controller application or from an alternate 'Web Designer' application, which is selected in the Cscape hardware configuration. The typical method for transferring the published web pages to the OCS controller is via FTP over an Ethernet connection.

Using FTP, the pages are transferred from Cscape to the Removable Media card. Once the published web page files have been successfully transferred to the Removable Media card in the controller, the interface can be remotely viewed from any PC, or wireless device connected to the same local network.

WebMI Glossary

WebMI Glossary	
ASCII (over TCP/IP)	American Standard for Information Interchange (over Ethernet)
DINT format	Double Integer
FTP	File Transfer Protocol
HTML5	Latest version of Hypertext Markup Language
HTTP	HyperText Transfer Protocol
HTTPS	HyperText Transfer Protocol Secure that uses TLS for secure connection.
TCP/IP	Transmission Control Protocol/Internet Protocol
MAC ID	Media Access Control Address
SSL	Secure Sockets Layer (Used with HTTPS)
SVG format	Scalable Vector Graphics file
TLS Protocol	Transport Layer Security

WebMI Terms and Conditions of Use

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11. You agree that you will be solely responsible to HORNER APG for all activities that occur under your HORNER APG account.
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UPDATED April 25th, 2018

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Chapter 2: WebMI License

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License Overview

A license is required to utilize the WebMI feature and is applied to a single Horner OCS. The license is good for the life of the unit, and there are not recurring costs. There are multiple license options and multiple paths to obtain a license. The license is tied to that OCS unit's Ethernet MAC ID. At the time this document was published, the WebMI license options are as follows:

Part Number	Users	Data Points	Pages	Licenses
HE-WMV005 (Free Trial Version)	1 User	5	1	1
HE-WMV01001	Unlimited	100	20	1
HE-WMV09901	Unlimited	Unlimited	Unlimited	1

- **Pages**: These are the number of web pages built by Cscape. The number of pages is the same as the number of screens configured in an application. **Example**: If the application has eight (8) configured screens, a 20-page or unlimited license is required or an alternate application would need to be published that conforms to a 5-page license.
- **Users**: The number of users defined in the User Security Configuration for Level Based Access. Refer to"Publish WebMI Pages" on page 41.
- **Data Points**: Any screen object that is assigned a %address or variable uses a Data Point. **Example**: numeric, switch, lamp, and trend objects would use Data Points. Objects not assigned a %address or variable do not use Data Points. Example: static text, bitmaps, shapes, and screen jumps typically do not use Data Points. However, it is possible through object options such as Attributes to assign a %address or variable. Attributes can be used to override colors, visibility, etc. In this case, because a %address or variable is assigned, a Data Point is used. A single data point used repetitively on multiple screens still counts as only one used data point.

Obtain a WebMI License

Free License

WebMI site: https://licensing.hornerautomation.com/

a. Log in and enter the MAC ID of the Horner OCS to be licensed.
b. Select 'Free Trial'. The Free trial license includes one Page, one User, and five (5) Data Points.
c. Check the box to accept terms and conditions and click 'Obtain License.'
d. Next you will have the option to download the license file (recommended). The license file will be placed in the internet browser's download folder and can be moved to a more convenient location if necessary.

The license is now established in the WebMI system that is located on Horner servers and will be available for retrieval in Cscape later in the process. In the WebMI system, the license is associated with the customer log-in email address and the entered Horner OCS MAC ID.

Purchase a License

Global Website: https://hornerautomation.com/product/webmi/
When you complete the purchase, you will receive an email that includes a voucher number and instructions on how to proceed. When the process is completed the license is established in the WebMI system and is associated with the owner's email address and OCS MAC ID.

For Europe: http://www.horner-apg.com/en/news/2015/horner-webmi.aspx

Purchase a license from Authorized Horner Distributor

When purchasing from a distributor, the distributor provides the voucher number to be entered in the WebMI site: https://licensing.hornerautomation.com/ . When the process is completed the license is established in the WebMI system and is associated with the owner's email address and OCS MAC ID.

Distributors in **North America** can be located by checking the Channel Partner Locator.
Link: https://hornerautomation.com/channel-partner-locator/

Distributors in **Europe** can be located by checking the Distributor Centre.
Link: https://hornerautomation.eu/product/webmi/

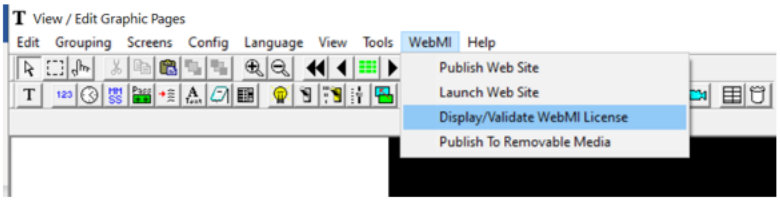
Creating and Upgrading of a License from Cscape

From **Cscape 9.90 SP4** onwards, all users of Cscape must register their email address with Horner so that they can be eligible to use licensed products like WebMI.

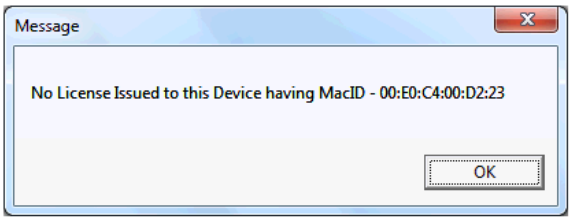
A valid license is created from the WebMI Licensing website: https://licensing.hornerautomation.com/
The license can be loaded to the device by using the Upgrade Option from Cscape. Creating and Upgrading of a valid license using the "**Upgrade Option**".

Step 1: Go to the Cscape **Graphics Editor** via the Screen icon, , and select **WebMI > Display/Validate WebMI License.**

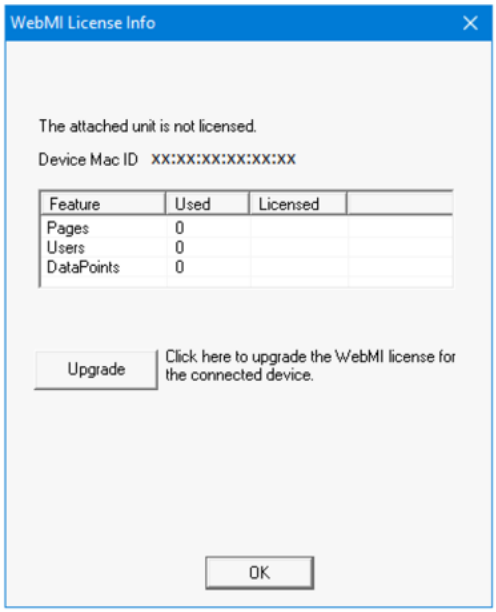
NOTE: In older versions of Cscape select Edit > Display / Validate WebMI License.



The following window is displayed:

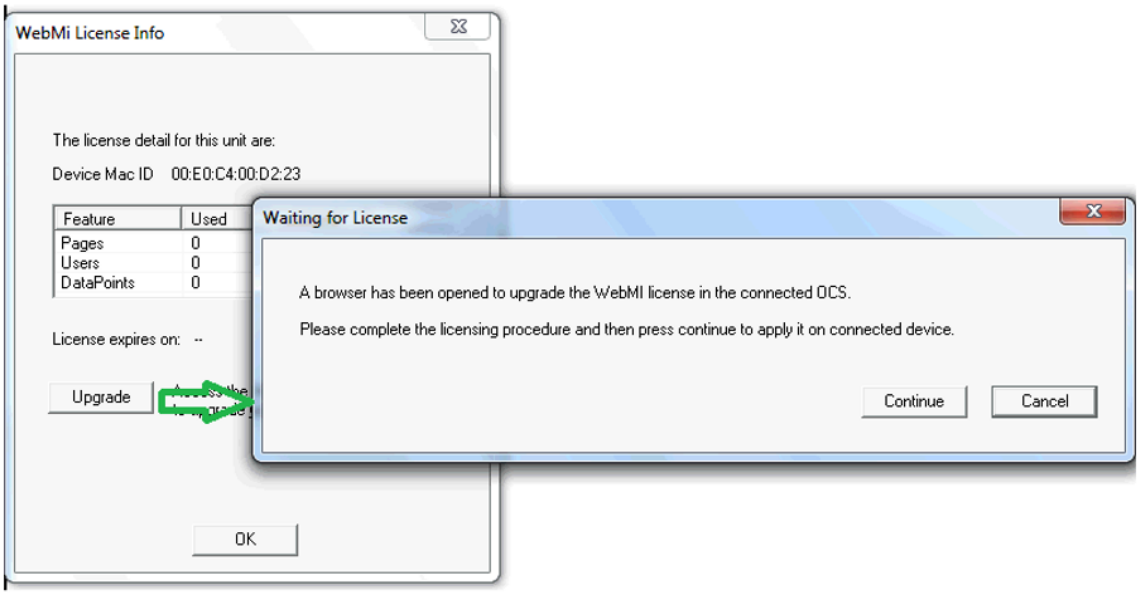


Selecting **OK** displays the following dialog:



- **Device Mac ID**: Displays the MAC ID of the connected device.
- **Pages**: Displays the number of screens used/licensed in the graphics editor.
- **Users**: Displays the number of users configured/licensed in the user access configuration of the graphics editor
- **DataPoints**: Displays the number of registers used/licensed in the graphics editor.

Step 2: Select the **Upgrade** option and the following window is displayed as well as WebMI Licensing Website will be opened automatically in the default browser.



Chapter 3: WebMI Licensing Portal

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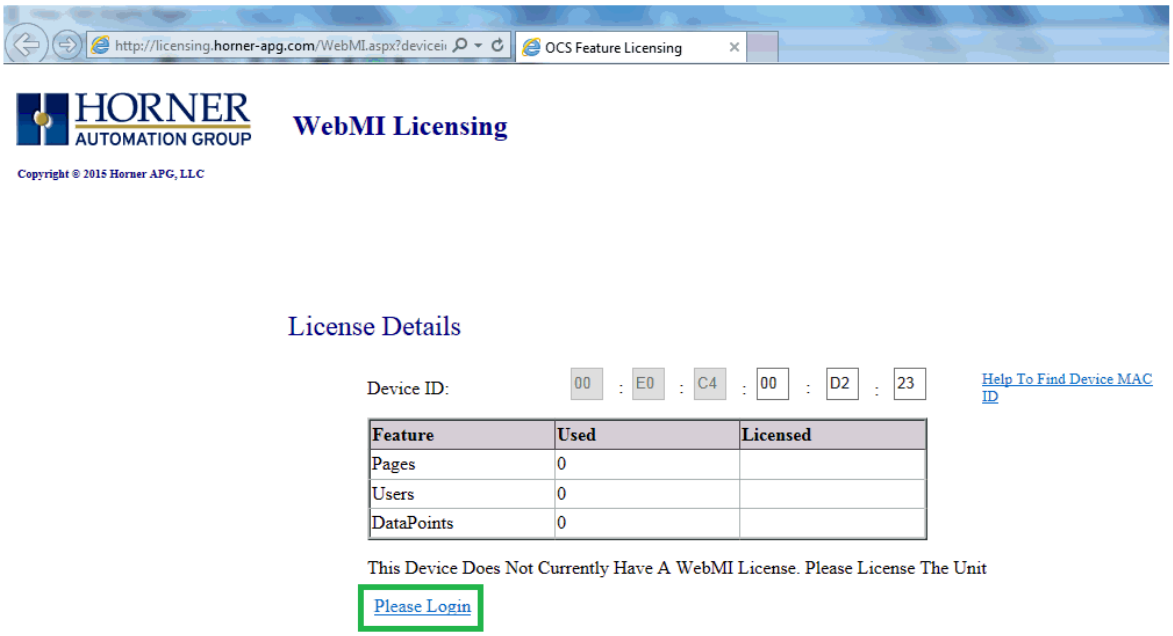
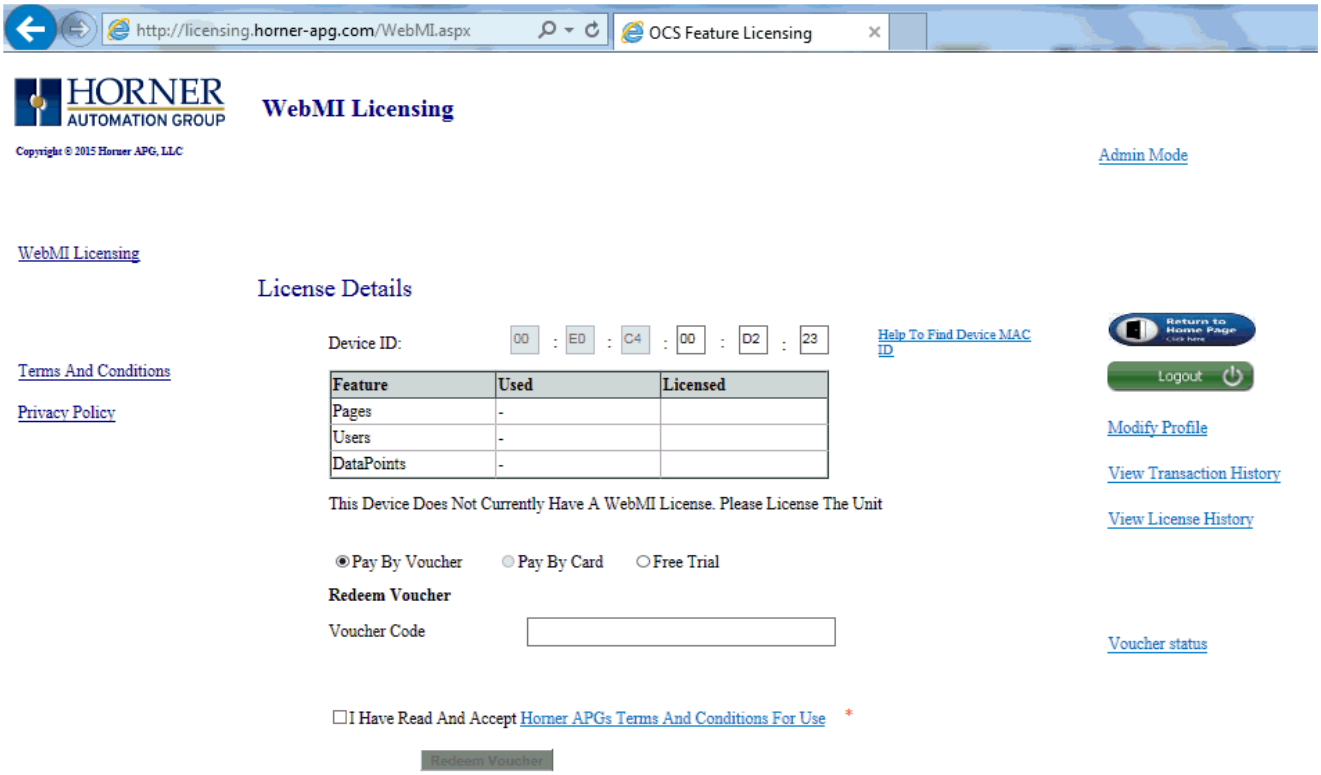
Once the steps in Section 2 are completed, the following website is opened in the browser with the Device ID mentioned. Click on **Please Log in** link which takes the user to the Log in Page.



Log-in to the website using the already created user name and password. The following web page is displayed:

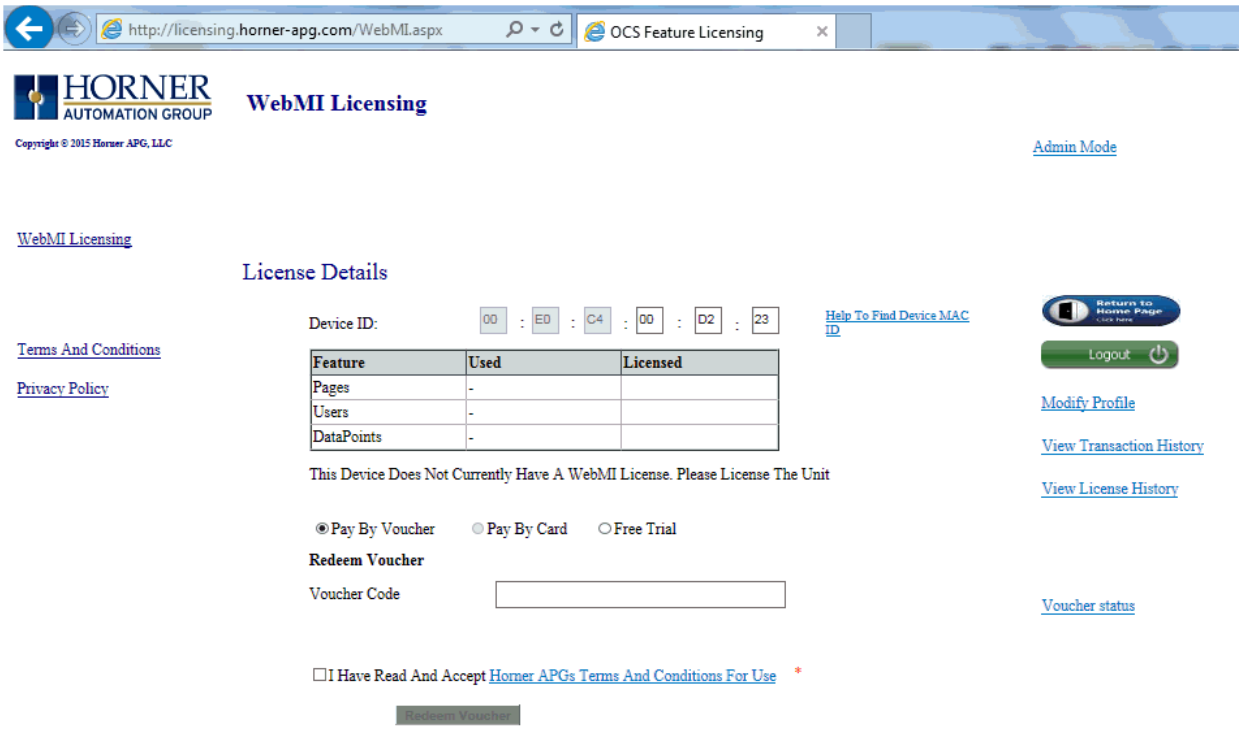


License can be created by using any one of the following options:

a. **Pay By Card** - The user can purchase a license using credit/debit cards.
b. **"Pay By Voucher" on the next page** - A voucher Code will be created by the administrator and user can create a license with the code.
c. **"WebMI Licensing Portal" on the previous page** - A free trial license will be created having 1 page, 1 user and 5 Data Points.

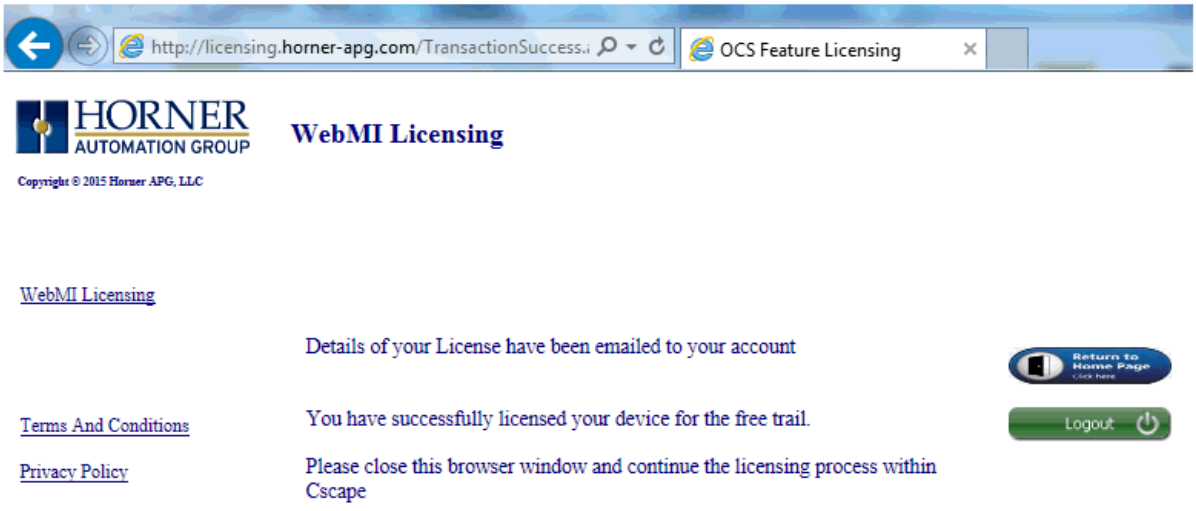
Pay By Voucher

Select Pay By Voucher option. In the "**Voucher Code**" field enter the voucher code given by the administrator.

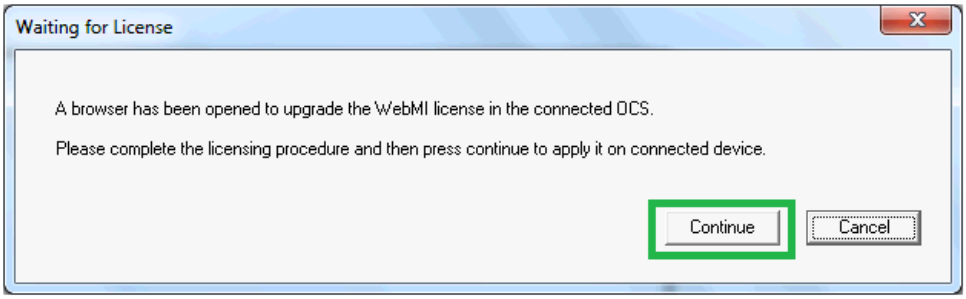


After entering a valid Voucher Code, details regarding the number of licenses remaining, with the number of users, pages and data points is displayed. User needs to accept the Horner APG's Terms and Conditions to redeem the voucher.

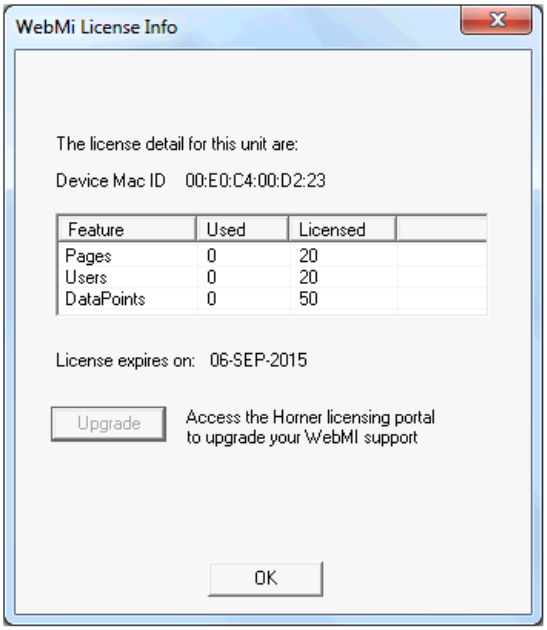
Select **Redeem Voucher**, the following web page is displayed.



Return to Cscape and select the **Continue** button.



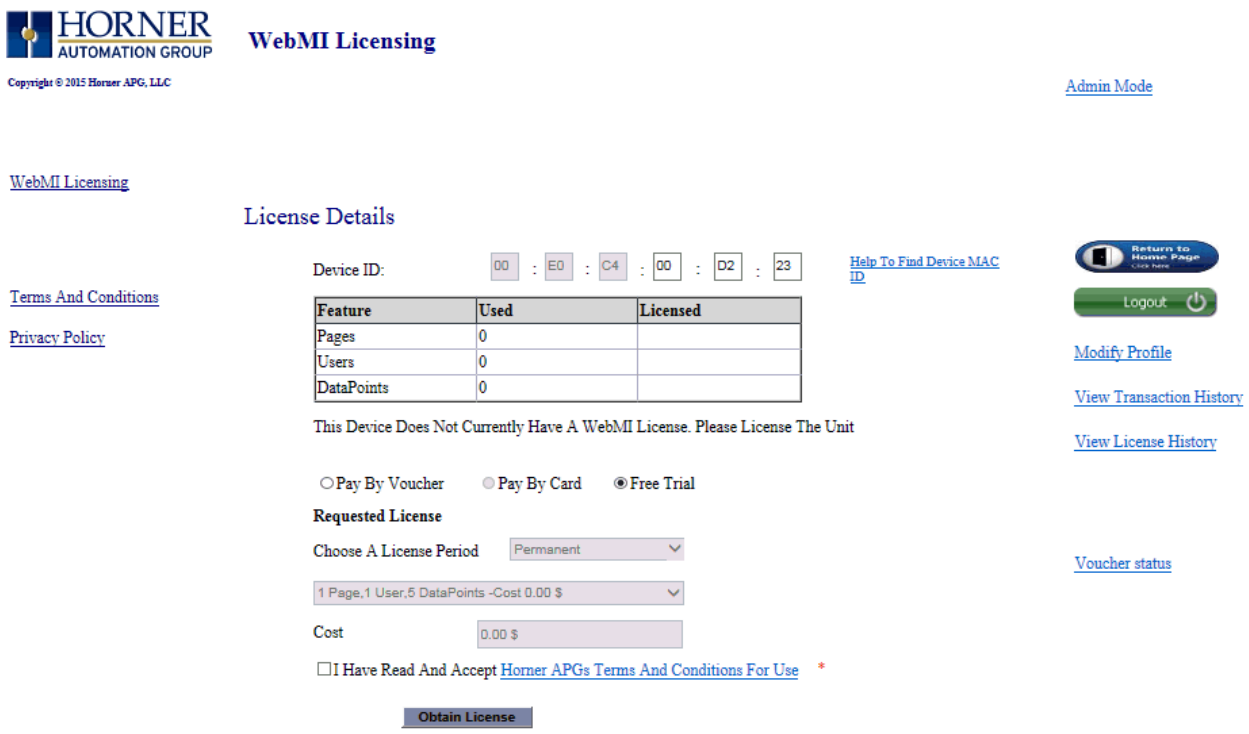
The following window is displayed. Clicking on **OK** loads the connected device with a valid license.



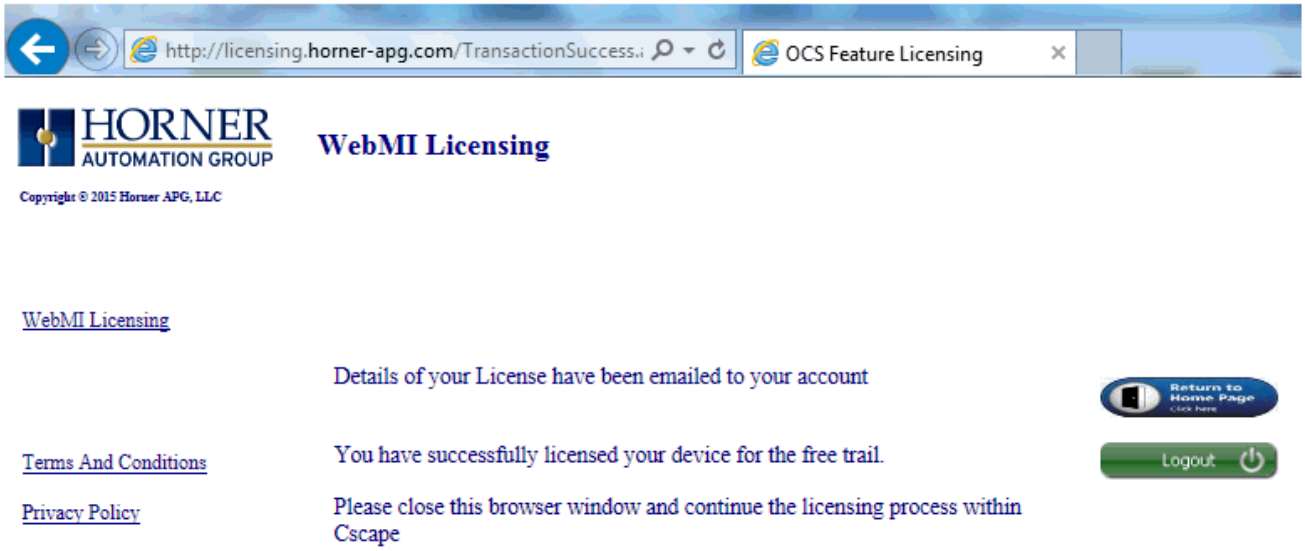
- **Device Mac ID**: Displays the MAC ID of the connected device.
- **Pages**: Displays the number of screens used/licensed in the graphics editor.
- **Users**: Displays the number of users configured/licensed in the user access configuration of the graphics editor
- **DataPoints**: Displays the number of registers used/licensed in the graphics editor.

Free Trial

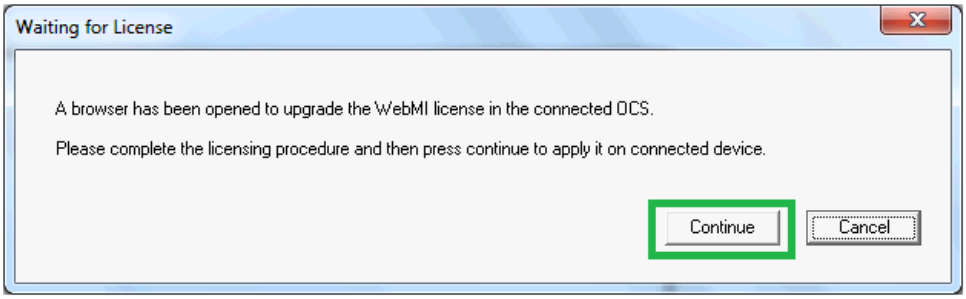
Select **Free Trial** option. The following page is displayed:



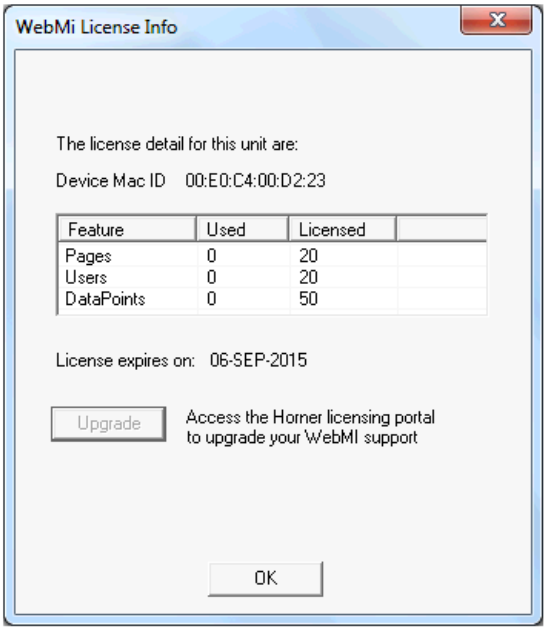
The Free Trial license is limited to only 1 page, 1 user and 5 Data Points. After accepting the Horner APG's Terms and Conditions select **Obtain License**, the following page is displayed:



Return to Cscape and select the **Continue** button:



The following window is displayed. Clicking on **OK** loads the connected device with a valid license.



- **Device Mac ID**: Displays the MAC ID of the connected device.
- **Pages**: Displays the number of screens used/licensed in the graphics editor.
- **Users**: Displays the number of users configured/licensed in the user access configuration of the graphics editor
- **DataPoints**: Displays the number of registers used/licensed in the graphics editor.

Chapter 4: Activate Evaluation License

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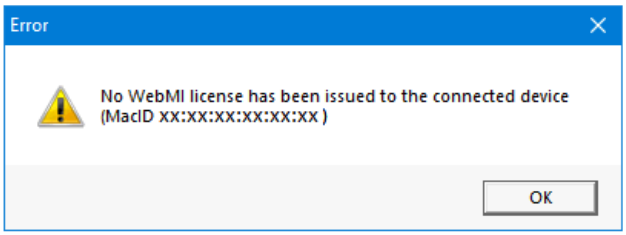
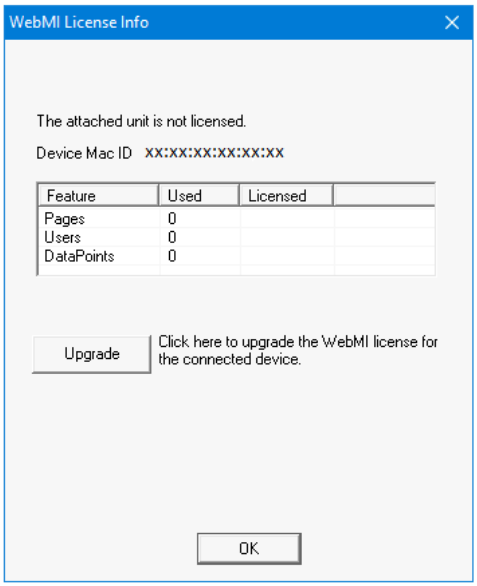
Applying WebMI License for a Registered Cscape

From **Cscape 9.90 SP4** onwards, all users of Cscape must register their email address with Horner so that they can be eligible to use licensed products like WebMI.

1. Verify your license by navigating through **Project Navigator > Graphics > WebMI > Display/Validate License**
2. The following window will be displayed if the connected device is not licensed.

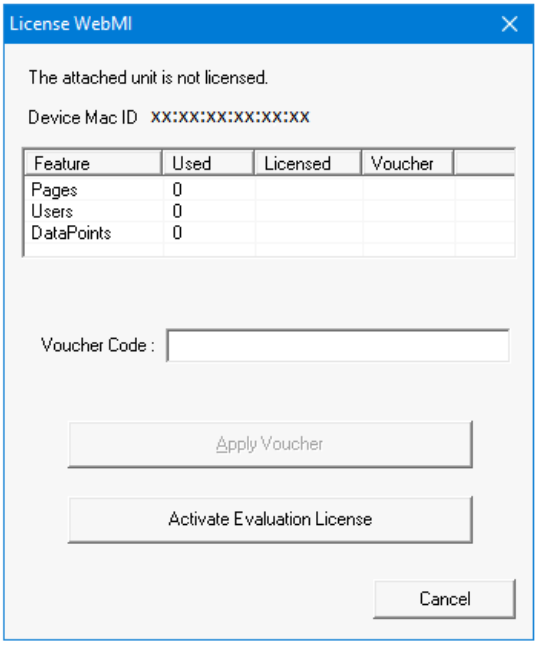


3. Selecting **OK**, displays the following dialogue.



- **Device Mac ID**: Displays the MAC ID of the connected device.
- Selecting **Upgrade** option displays the following dialogue:
- **Pages**: Displays the number of screens used/licensed in the graphics editor.
- **Users**: Displays the number of users configured/licensed in the user access configuration of the graphics editor
- **DataPoints**: Displays the number of registers used/licensed in the graphics editor.

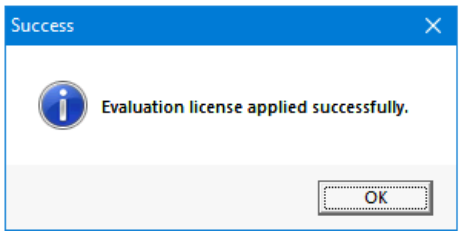
4. Selecting the**Upgrade** option displays the following dialog:



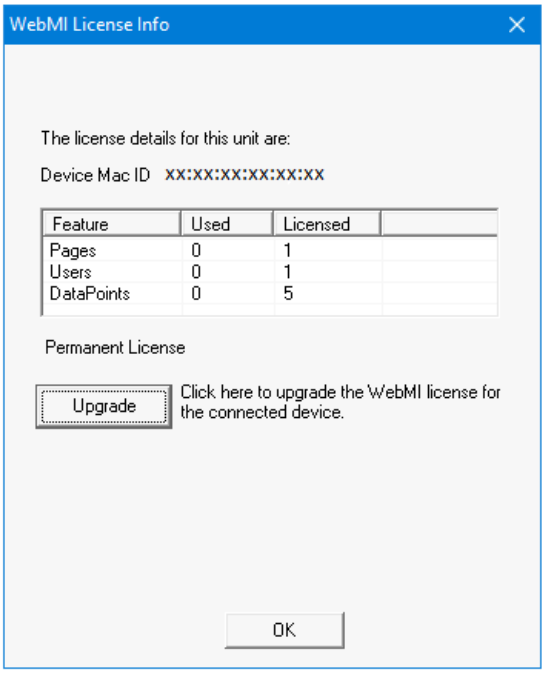
Activate Evaluation License

Clicking on **Activate Evaluation License** activates the trial version license for the device in which user can use 1 page, 1 user, and 5 DataPoints. Once selected, the following confirmation message is displayed.

Select **OK**.



Clicking on **OK** of the above message, displays the following updated window. The evaluation license is a permanent license which has validity for 100 years from the date licensing the connected device.

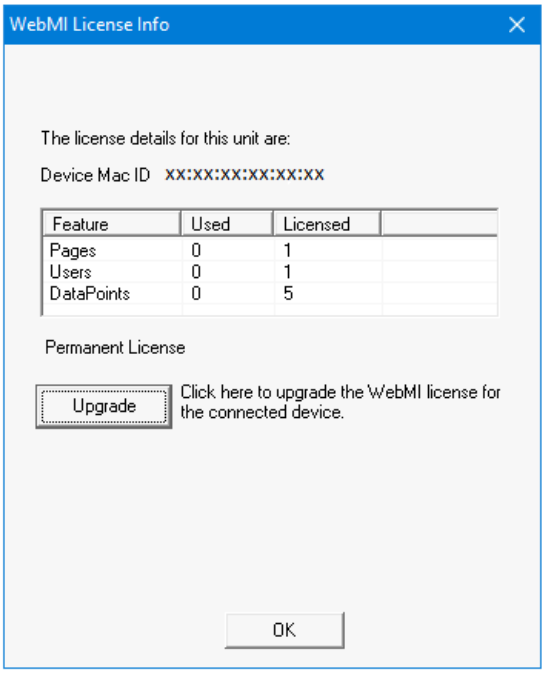


- **Device Mac ID**: Displays the MAC ID of the connected device.
- **Pages**: Displays the number of screens used / licensed in the graphics editor.
- **Users**: Displays the number of users configured / licensed in the user access configuration of the graphics editor
- **DataPoints**: Displays the number of registers used / licensed in the graphics editor.

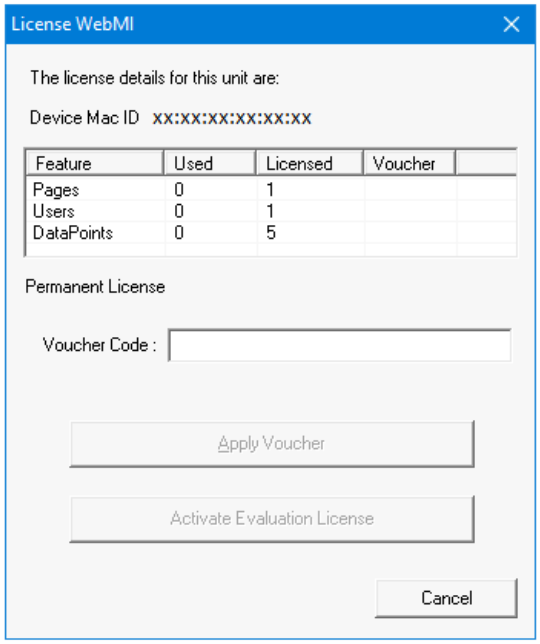
Voucher Code

To apply the WebMI License to the OCS with a Voucher Code, complete the following steps.

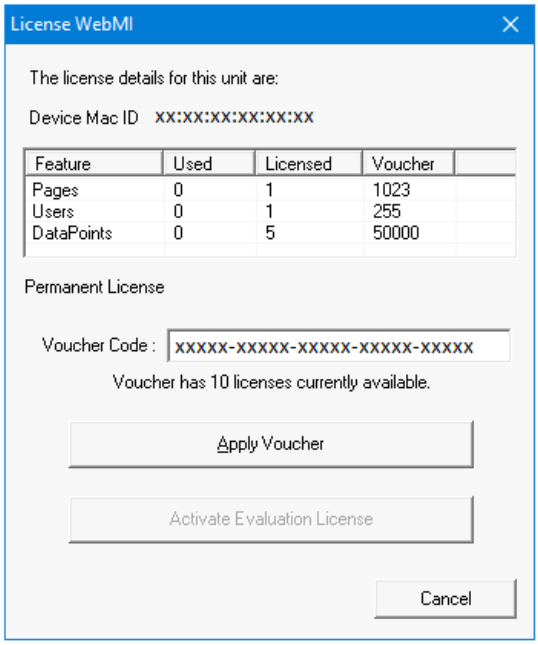
If the user needs to upgrade the license for more credentials, then user needs to get voucher code from Horner and apply the same. For this, select **Display / Validate license** option from WebMI menu of the **Graphics Editor**. The following window is displayed:



Clicking on Upgrade button displays the following window where user can apply the given voucher in **Voucher Code** field.

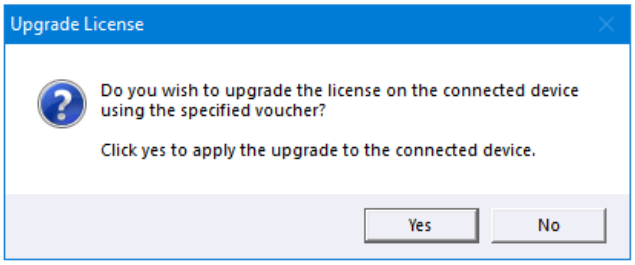


After entering valid voucher code, the following details will be displayed in reference to entered voucher code.

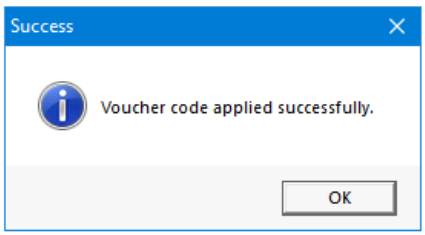


After entering valid voucher code, the voucher details (number of pages, users and DataPoints) will be updated along with number of license available for the given voucher code.

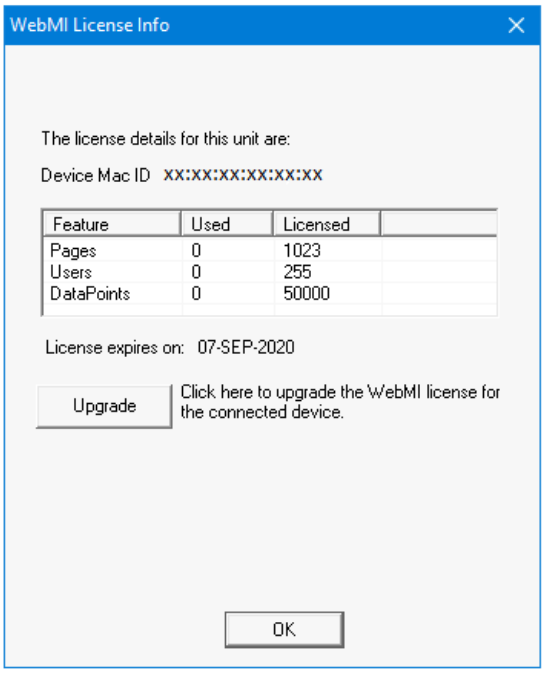
Clicking on **Apply Voucher**, displays the following window if the connected device is already licensed.



Clicking on **Yes** of the above message displays the following confirmation window.



Clicking on **OK** of the above message displays the following window with license and expiration details.



Clicking on **OK** upgrades the connected device to the latest license.

Chapter 5: Building Web Pages

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Publish Pages from Main Application 24
Publish Pages from Web Designer 24
Web Designer Models Configuration 25

Basics of Building Web Pages

Cscape builds web pages according to HTML5 standards. The pages built are derived from the screens developed in the Cscape Graphic Editor. With a few exceptions, what you see in the Cscape Graphic Editor is what you get in the WebMI built web page. The benefit is that you can monitor and control your OCS application remotely without any manual HTML development. Another primary benefit is that the web pages are not limited to predefined templates or premade pages.

NOTE: Early in the process it should be decided what kind of screen resolution is needed and if the web pages are to perform synchronously with the screens on the OCS. This will determine if pages should be published from the main application or from a Web Designer application.

Publish Pages from Main Application

The main application is the primary program .csp or .pgm file that is downloaded to the OCS controller. This includes the logic, I/O configuration, communication protocols, and screens that appear on the OCS itself. The Hardware Configuration of the main application will show the Series, Device Type, and Model # of the OCS in use. WebMI can publish pages from the main application. The result is that the web pages viewed in an internet browser will appear mostly identical to what is seen on the OCS screen.

When publishing from the main application, Screen Sync for synchronous operation may be selected. Use Screen Sync to have the pages displayed in the browser follow what is displayed on the OCS. Synchronous mode also causes the OCS screens to follow what is being done from the internet browser. Example: when Screen Sync mode is checked, when you jump to a new screen in the web browser remotely, the OCS will also jump to that same screen on its display.

Publish Pages from Web Designer

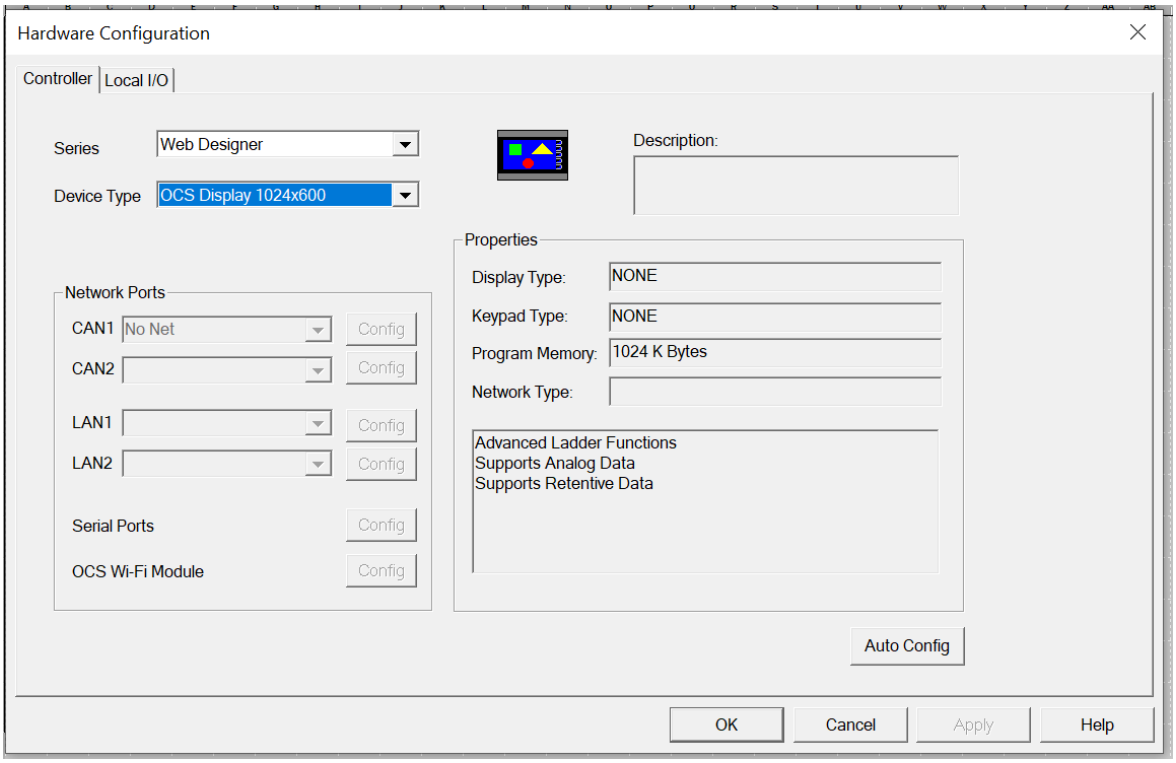
A Web Designer Application is a separate program that allows for larger published screen resolutions which are closer to that of a PC monitor. A Web Designer program does not include logic, I/O configuration, or communication protocols. The Hardware Configuration of the Web Designer program will show Series: Web Designer and Device Type: OCS Web Design + desired screen resolution. Using Web Designer means that there are now multiple application programs for the OCS including the main application and the Web Designer application.

The screen resolution will not match the resolution of the OCS controller, which is typically smaller. Publishing from a Web Designer program frees the developer to build screens without the limitations inherent with the lower resolution OCS screens.

Web Designer Models Configuration

Web Designer Models can be accessed through **Hardware Configuration**.
Home > Program > Hardware Configuration or through the **Project Navigator**

Select **Web Designer** in the from the **Series** drop-down box.



NOTE: The following graphics objects are **not** supported by WebMI:

1. Note Object
2. Trends – Standard Trend Type
3. Video Object
4. Recipes Object.
5. Removable Media (Only A drive support is added).
6. RCC models do not support Alarms and Trends Objects.

Chapter 6: Setting up a Horner OCS

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Removable Media/USB/microSD File System

In most controllers, the microSD card memory slot uses the PC-compatible FAT32 file system supporting up to 32GB cards.

NOTE: In the XL15+ Controllers, the microSD card memory slot supports SDHC, SDXC IN FAT32 format up to 128GB max.

WebMI Ethernet Specifications

Ethernet Protocol TCP Port Usage					
Ethernet Protocol	UDP Port		TCP Port		Maximum Connections
	Hexadecimal	Decimal	Hexadecimal	Decimal	
FTP	n/a	n/a	0014 & 0015	20 & 21	4
WebMI/HTTP	n/a	n/a	0050	80	4
HTTPS			01BB	443	4
CsCAN (Cscape)	n/a	n/a	4845	18501	1

NOTE: The maximum number of connections depends on models connected -
4 for IMX28 (XL4, XL7, EXL10, EXL6, EXL6(W), X5 and RCC), XL Plus, XL Prime models.
2 for M7 (X4, X7, X10) and M4 (X2, XLEe and XLTe) models.

Ethernet Configuration - IP Parameters

IP Parameters from Cscape Hardware Config/LAN Config

Open the Cscape Hardware Configuration window and verify that the Series and Device Type match the connected controller. Enter the desired network parameters in the Cscape Hardware Configuration/LAN Config.

For simplicity, the examples in this manual will show a local connection directly from PC to OCS. IP address 192.168.0.110 is used for the OCS IP. Hence, the PC IP address must be set on the same subnet, using an IP such as 192.168.0.x, where x is in the range of 1-254. Both subnet addresses should be set to 255.255.255.0.

Example OCS	Example PC
IP Address – 192.168.0.110	IP Address – 192.168.0.99
Subnet Mask – 255.255.255.0	Subnet Mask – 255.255.255.0
Gateway – 0.0.0.0	Gateway – 0.0.0.0

For OCS models with more than one Ethernet connection, these settings must be done on LAN1. Other OCS models have only one LAN port so this is not a concern.

NOTE: The OCS controller cannot open the door to make itself available to the World Wide Web; the path must be set in place for it. For connections that are to be accessed remotely, use an IP address as assigned by your IT staff or Internet Service Provider. There are also hardware solutions available from companies such as MB Connect, Secomea, Ewon, and others that can allow an OCS and WebMI functionality to be accessible from the internet. For more details, contact your local distributor.

Ethernet Configuration – IP Parameters

For primary operation the IP address, Net Mask, and Gateway should be set in the LAN config of the Cscape Hardware Configuration. There are options to get IP parameters from the LAN Config or to get parameters from registers. It is possible to set the Ethernet IP parameters from the OCS System Menu, but only as a temporary measure. The following points on IP parameter configuration should be considered.

IP Parameters in Non-Volatile RAM

OCS units with HMI displays

Any IP parameter settings made in the system menu will be lost after cycling power to the unit. It will revert to the last downloaded Cscape LAN Config that was loaded into non-volatile or battery backed RAM.

Cscape LAN Config, Get Settings from – Configuration

When 'Get settings from' is set to Configuration, the IP parameters specified under 'Default Settings' is used after downloading to the controller. The IP parameters are represented in System Menu/Set Networks and can be edited. However, any edits made from System Menu/Set Networks are not retained through a power cycle. After power cycle the unit reverts back to the last downloaded Cscape LAN Config that was loaded into non-volatile RAM at power down.

Cscape LAN Config, Get Settings from - Register

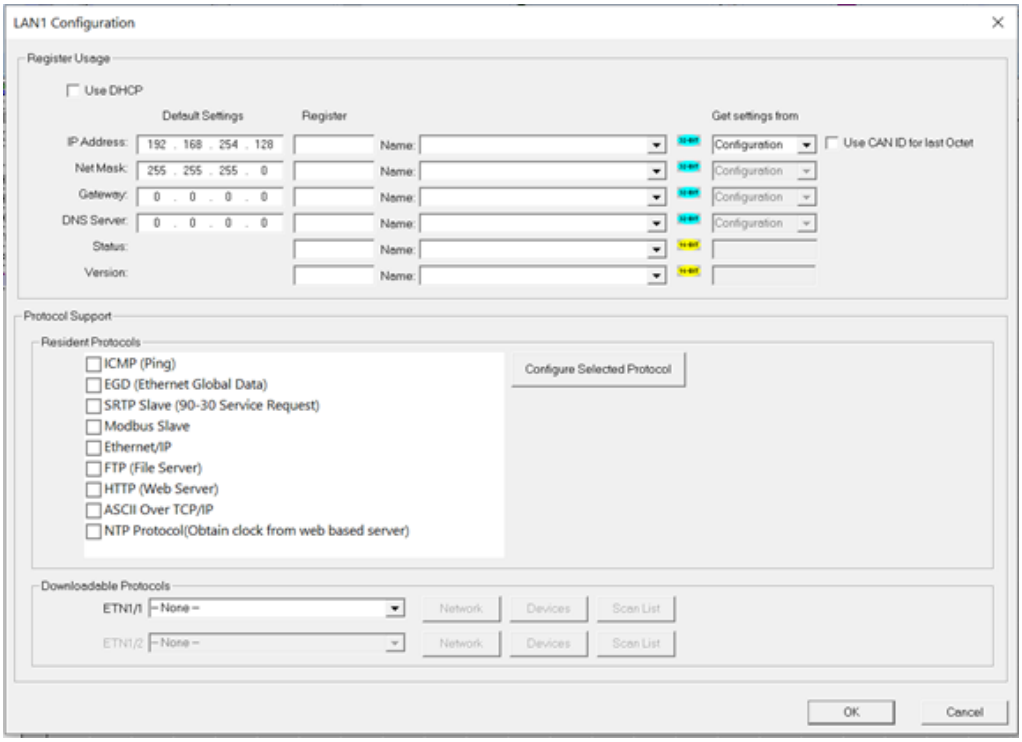
When 'Get settings from' is set to Register, the IP parameters are retrieved from the OCS registers assigned in LAN Config. Configured registers must be populated with the desired IP parameters.

- The IP parameters are represented in System Menu/Set Networks
- The IP Parameters cannot be edited from System Menu/Set Networks while the unit is in Run Mode.
- The IP parameters always follow the values in the registers unless the OCS unit is placed in idle mode. Then the IP parameters can be edited in System Menu/Set Networks. When the OCS is placed back in Run Mode, it reverts to the registers for IP parameters.

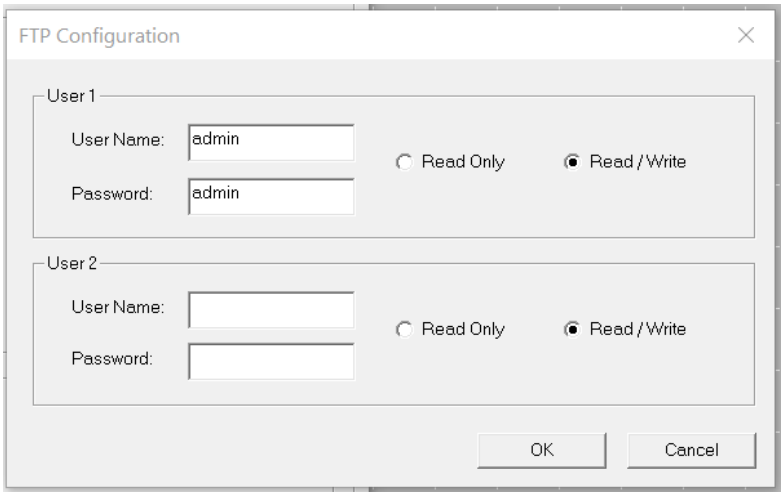
Ethernet Configuration – FTP

In Cscape Hardware Configuration/LAN Config, check the box to enable FTP (File Server). With regard to WebMI, FTP is used to transfer published web page files to the OCS removable media card via Ethernet. While it is not essential to use FTP to transfer the web page files, FTP is a more convenient option when the network is properly configured. The alternative to FTP is to manually place the WebMI files on the removable media card directly from the PC, then remove the card from the PC and install into the OCS. More on this in"Setting up a Horner OCS " on page 26

Home > Hardware Configuration > LAN1/2 > Config (button) > FTP > Configure Selected Protocol



When using FTP you must supply a User Name and Password in the FTP Configuration. For the examples in this document, we will use “admin” for User Name and Password. Select **Read / Write.**

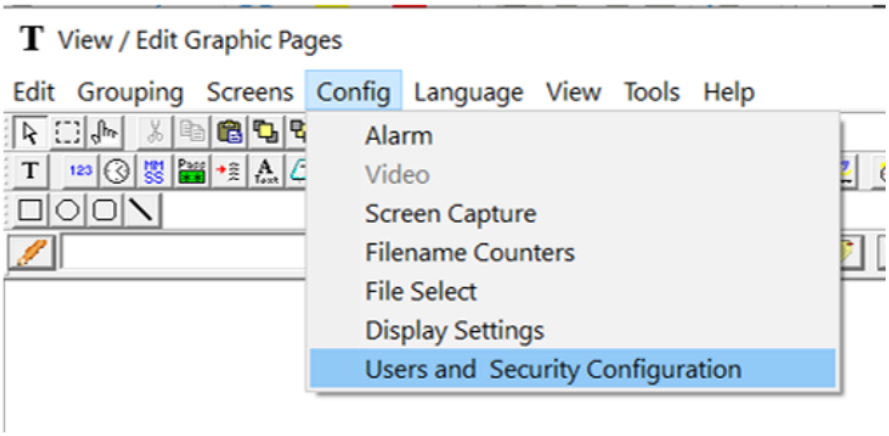


User Access Level Editor

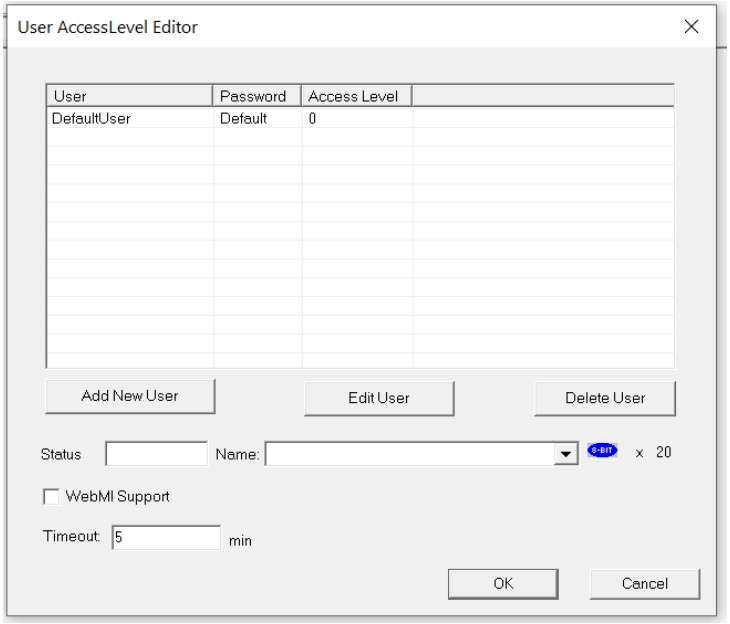
Level Based Access is a feature where a list of users can be created and configured with associated passwords and access levels. Graphic objects on the user screens can be configured to have an associated access level. This level will determine which users can interact with that screen object, based on their access level. Utilizing Level Based Access on screen objects is possible, but not a prerequisite to the implementation of WebMI. However, it is necessary for a WebMI application to configure at least one user in the User Security Configuration.

In a Web Designer application, the User Security Configuration is independent from the User Security Configuration in the main application. The User Security configurations between the main and the web designer do not have to match. Log ins from the screen and from WebMI are monitored separately in the status registers. When opening the WebMI page in an internet browser on a completed system, a prompt to enter a user name and password will appear. A user name and password assigned in the User Security Configuration must be used. (Not the FTP user name and password).

In the **Graphic Editor**, select **Config > Users and Security Configuration**.



User Security Configuration



Add a User

- Highlight the existing "**DefaultUser**" line and click '**Edit User**' or select the '**Add User**' button to create a user-name, password and assign an access level. Here an access level of 0 was selected, which is the lowest level of access.
- This is the user name and password that is entered later in the internet browser. Up to 255 Users at any of 8 access levels (0 to 7) can be configured. However, in WebMI the number of users possible may be limited depending on the license limitations.
- For WebMI usage, username/password/access level must be configured as constants. They cannot be assigned as registers.

Status - Local Device Status

The status indicates the user currently logged in to the User Security feature and for how long they have been logged in. This is for users directly using the OCS touchscreen and is separate from the WebMI user logged in, which is covered in the next section. 20 bytes total is split into a UDINT timer to show the length of time the user has been logged in, plus 16 bytes/characters to indicate the username currently logged in.

Register Example using %R1000 assigned to Status

- %R1000 + %R1001 = OCS User Logged In Timer (%R1000, format UDINT)
- %R1002 through %R1009 = OCS username Logged In (%R1002, format ASCII x 16 characters)

Variable Example using UINT UserStatus[] Variable Array, Length 10, assigned to Status

- UserStatus[0] + UserStatus[1] = OCS User Logged In Timer (UserStatus[0], format UINT, extra logic needed if log ins greater than 18 hours are expected)
- UserStatus[2] through UserStatus[9] = OCS username Logged In (UserStatus[2], format ASCII x 16 characters)

WebMI Support

When the WebMI Support box is checked, the User Security Status expands to 100 Bytes total. The first 20 Bytes remain unchanged for User Security OCS User Logged In status. An additional 80 bytes covers the status of 4 WebMI users logged in. The extra WebMI status is optional. Using the WebMI feature on OCS does not require that the 'WebMI Support' box be checked.

Register Example using %R1000 assigned to Status

- %R1000 + %R1001 = OCS User Logged In Timer (%R1000, format UDINT)
- %R1002 through %R1009 = OCS username Logged In (%R1002, format ASCII x 16 characters)
- %R1010 + %R1011 = WebMI User 1 Logged In Timer (%R1010, format UDINT)
- %R1012 through %R1019 = WebMI username 1 Logged In (%R1012, format ASCII x 16 characters)
- %R1020 + %R1021 = WebMI User 2 Logged In Timer (%R1010, format UDINT)
- %R1022 through %R1029 = WebMI username 2 Logged In (%R1012, format ASCII x 16 characters)
- %R1030 + %R1031 = WebMI User 3 Logged In Timer (%R1010, format UDINT)
- %R1032 through %R1039 = WebMI username 3 Logged In (%R1012, format ASCII x 16 characters)
- %R1040 + %R1041 = WebMI User 4 Logged In Timer (%R1010, format UDINT)
- %R1042 through %R1049 = WebMI username 4 Logged In (%R1012, format ASCII x 16 characters)

Variable Example using UINT UserStatus[] Variable Array, Length 50, assigned to Status

- UserStatus[0] + UserStatus[1] = OCS User Logged In Timer (UserStatus[0], format UINT, extra logic needed if log ins greater than 18 hours are expected)
- UserStatus[2] through UserStatus[9] = OCS username Logged In (UserStatus[2], format ASCII x 16 characters)
- UserStatus[10] + UserStatus[11] = WebMI User 1 Logged In Timer (UserStatus[10], format UDINT)
- UserStatus[12] through UserStatus[19] = WebMI username 1 Logged In (UserStatus[12], format ASCII x 16 characters)
- UserStatus[20] + UserStatus[21] = WebMI User 2 Logged In Timer (UserStatus[20], format UDINT)
- UserStatus[22] through UserStatus[29] = WebMI username 2 Logged In (UserStatus[22], format ASCII x 16 characters)
- UserStatus[30] + UserStatus[31] = WebMI User 3 Logged In Timer (UserStatus[30], format UDINT)
- UserStatus[32] through UserStatus[39] = WebMI username 3 Logged In (UserStatus[32], format ASCII x 16 characters)
- UserStatus[40] + UserStatus[41] = WebMI User 4 Logged In Timer (UserStatus[40], format UDINT)
- UserStatus[42] through UserStatus[49] = WebMI username 4 Logged In (UserStatus[42], format ASCII x 16 characters)

Timeout (Mins)

This specifies a timeout after which protected screen access mode will resume by logging out the user. The configurable Timeout range can be set from 1 to 60 minutes. After a Timeout occurs, objects on the OCS display screen that are set with level-based security cannot be manipulated until a user logs in again. In relation to WebMI, when the Timeout value is reached, the screen in the internet browser turns a shade darker and at the bottom of the screen the message "User Session Timed Out" appears. Upon Timeout, the WebMI pages are not accessible. To access the pages again, click the browser refresh button.

WebMI Security

Information about Secure Connections - WebMI supports non-secure HTTP on Port 80 and secure HTTPS on Port 443. For HTTPS connections, TLS ver. 1.2 protocol is supported. Requests that come in via HTTP are not automatically redirected to HTTPS. HTTPS requires a digital certificate from a certification authority (CA).

Information about Secure Connections

WebMI supports non-secure HTTP on Port 80 and secure HTTPS on Port 443. For HTTPS connections, TLS ver. 1.2 protocol is supported. Refer to the glossary in "WebMI Overview" on page 4.

Requests that come in via HTTP are not automatically redirected to HTTPS. HTTPS requires a digital certificate from a certification authority (CA).

Please contact Technical Support with regards to Security Certificate Generation.

North America	Europe
Tel: (317) 916-4274	Tel: (+) 353-21-4321-266
Website: www.hornerautomation.com	Website: www.hornerautomation.eu
Email: techsppt@heapg.com	Email: technical.support@horner-apg.com

Chapter 7: Web Options

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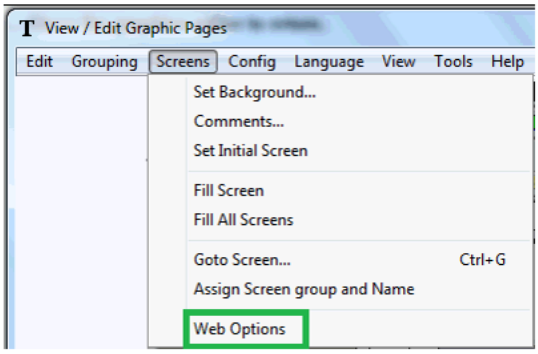
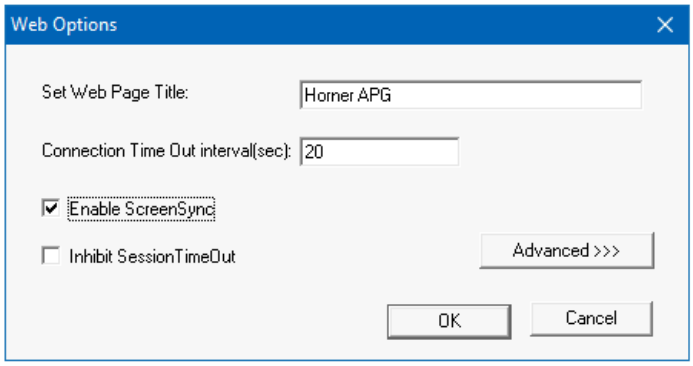
Download License File from WebMI Licensing Portal 39
Transfer the License File to the microSD Card Manually 39
Let Cscape Transfer the File 39
Verify the WebMI License File Transfer 40

In the Cscape Graphic Editor, Select: **Screens > Web Options**.



Web Options Configuration

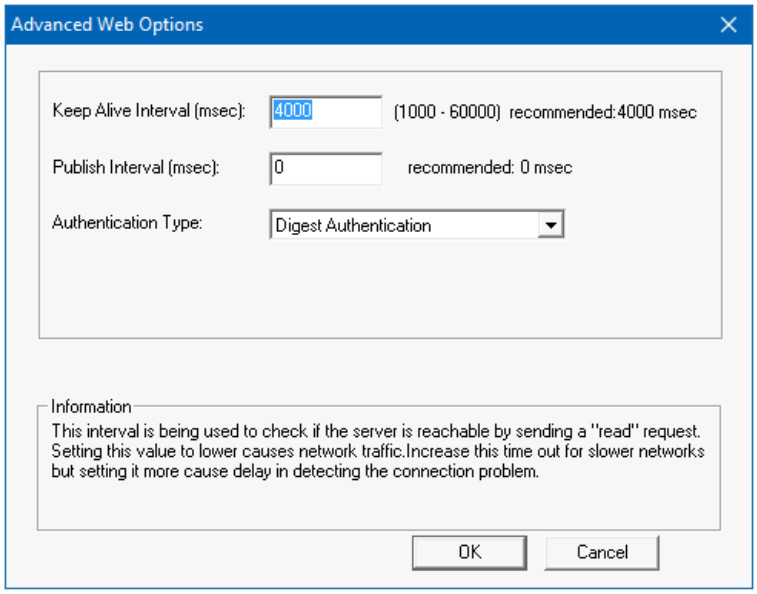
The following window is displayed:



- **Set Web Page Title** - This sets the text that will appear in the banner at the top of the web browser when a connection is made to the OCS WebMI Server. By default, it is set to Horner APG, LLC. Most OEMs/Users will want to change this to reflect their company name, or the name of the machine.
- **Connection Time Out interval (sec)** - This is the key time-out interval in seconds agreed upon between the WebMI Client (JavaScript Applet) and the WebMI Server in the OCS. WebMI uses the standard HTTP or HTTPS port for compatibility purposes. Using a unique port would cause the connection to be rejected by some network security devices. This is a busy port, which means message delays can occur even on connections with solid bandwidth. Because nuisance connection timeouts can be experienced, it is recommended that this value be set to at least 20 seconds.
- **Enable Screen Sync** - For applications where the WebMI web pages are duplicates of screens in the OCS, this allows screen changes made remotely on the browser to cause screen changes locally on the OCS and vice versa. This is analogous to the functionality you get with Windows Remote Desktop but with an OCS instead of a computer. Screen Sync is not available in a Web Designer application.
- **Inhibit Session Timeout** - Use this option to inhibit a Session Timeout. The session will run indefinitely. This applies only to Session Timeout that is configured in the User Security Configuration. This is not related to a Connection Timeout that happens when internet connectivity is lost.

Advanced Web Options Settings

Selecting **Advanced>>>** options displays the following window:



NOTE: Enable Sync Screen option is not available in Web Designer Models.

- **Keep Alive Interval (ms)** - Keep Alive interval specifies at what rate the network heart beat is checked in msec. Heartbeat Messages ensure the browser connection remains active. Without a heartbeat message, mobile browsers will shut off the connection quickly to save bandwidth. Default is 4000ms, after every four seconds the client checks for a reply from the device (OCS/Web Server) to confirm the network is up. If there is no reply after four seconds, then it will show a temporary disconnection in the network symbol on the web page. Data changes will not be reflected during this time. During this time, connection is not terminated, but after every four seconds the connection timeout count is checked.
- **Publish Interval (ms)** - Publish Interval specifies the rate at which the variables will be updated in the web client (internet browser), which is also the delay in sending values to the OCS web server when edited from the browser. If set to the value of 0, publishing is event driven where the changes are reflected immediately. In almost all applications there is no reason to delay the transmission of these new values. So, setting the value to 0ms is recommended. The Publish Interval is unrelated and should not be confused with publishing web pages described later in this document.
- **Authentication Type** - Digest and Basic authentication types are supported. Web server uses the selected authentication for user log in.
  - **Digest Authentication** - This authentication is more secure. Digest Authentication is the default setting.
  - **Basic Authentication** - This is less secure and should be used along with SSL connections or VPN

Inactivity Timeout

After the configured timeout (session timeout), "user session timed out" message appears and the message remains until user refreshes the page. Once refreshed, license agreement page appears.

Cscape to OCS Connection

Most controllers that support WebMI have the following options for connectivity with Cscape:

- **Serial** - The default serial programming port is MJ1.
- **USB** - Most controllers that support WebMI feature a Mini-B USB port for programming. No setting has to be made in the controller to make use of the Mini-B port for programming.
- **Ethernet** - Refer to prior Ethernet Configuration sections and OCS hardware manual.

For more information on connecting to an OCS with Cscape, please refer to the specific OCS User Manual via the Documentation Search page on the Horner website.

While WebMI is an Ethernet based feature, it is not necessary to connect to the OCS controller via Ethernet to set up the WebMI feature. Any of the above connection methods may be used.

Keep in mind to transfer published WebMI files to the controller via FTP, an Ethernet connection does have to be established. By having this Ethernet connection established, one could connect to the OCS with Cscape via Ethernet if desired. If the Ethernet connection is already established, it then becomes easy to test the WebMI application in an internet browser. The OCS supports simultaneous connections to both Cscape and Internet browsers from the same LAN1 port.

Download

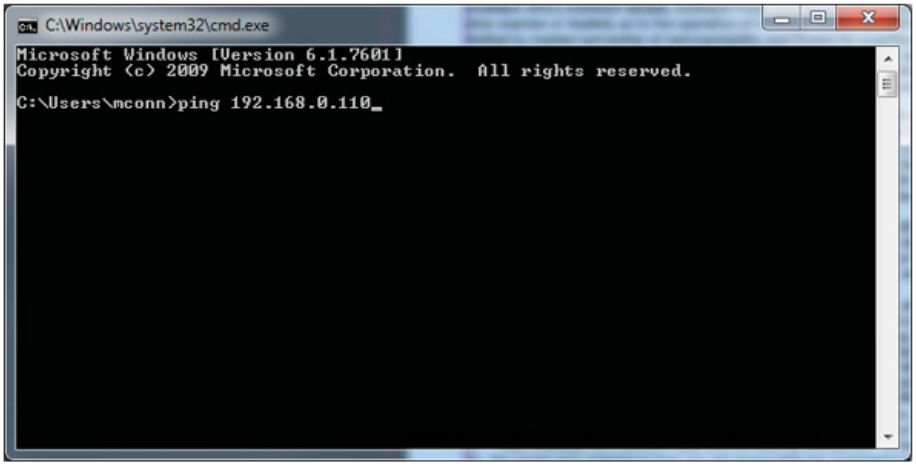
When the logic, protocols, screens, and hardware configuration are completed to satisfaction download the application to the OCS.

Program Checklist:

1. A completed Ethernet setup in LAN1 configuration.
2. FTP should be checked under Resident Protocols and username and password assigned in the LAN1 configuration. (If FTP is to be used to transfer the WebMI pages).
3. Password and username assigned in User Security Configuration.
4. **In the LAN Config, DO NOT check the HTTP (Web Server) protocol box. This is a separate feature that is not related or compatible with WebMI. Checking the HTTP Web Server protocol will cause WebMI to not work.**

Verify the Ethernet Connection

After configuring the OCS Ethernet parameters, it is a good idea to open a command prompt on the PC and Ping the OCS to insure an Ethernet connection has been established. To do this, enter "**cmd**" into the Windows search bar and click on **cmd.exe**. The following window will appear, enter "**Ping 192.168.0.110**" (or the IP address of your OCS) and hit **Enter**.



If there is a successful connection established, the command will return a response such as "Reply from 192.168.0.110: bytes=32 time=1ms TLL=64".

Applying the WebMI License to the OCS

The WebMI license file must be stored on a microSD card that is installed in the Horner OCS. There are two primary ways to transfer the file to the microSD card.

NOTE: Ensure that the OCS is set to the correct time and date. The time and date has to be the same or later than what is encoded in the license file.

Download License File from WebMI Licensing Portal

The license file needs to download to transfer manually. After obtaining a free or purchased WebMI license from the Horner WebMI website, the license file may be downloaded. This is an encrypted file that contains license details including the MAC ID of the intended OCS of which to apply the license. The content of this file should not be edited. Editing the content of the file will invalidate the file. The original file name is different for every license and includes the MAC ID of the licensed device. Example file name: WebMILicense-00E0C404c625.

NOTE: If you have already executed the steps to obtain a free Evaluation license or applied a license by using a voucher number from the Cscape graphic editor, you have already transferred the license file to the removable media card in the controller.

Transfer the License File to the microSD Card Manually

First rename the file. The file name should be renamed to **FIRMWARE.LIC** . Copy and paste or drag and drop the newly renamed FIRMWARE.LIC file onto the root directory of a microSD card installed in the PC. Then it is just a matter of removing the microSD card from the PC and installing it into the OCS controller whose MAC ID was used to set up the license. There are no further steps to be taken for manually transferring the license file. If there are multiple OCS units on site to be licensed, it is recommended to organize the license files so that they are easily paired with the correct OCS.

NOTE: From following firmware onwards, user can directly copy the license file without renaming.

- IMX28 (XL4, XL7, EXL10, EXL6, EXL6(W), RCC, X5) - FW 15.60
- M7 (X4, X7, X10) - FW 15.70
- XL Prime - FW 16.26

Let Cscape Transfer the File

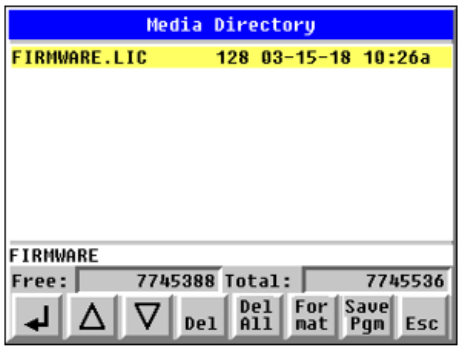
Establish a connection from Cscape to the controller via serial, USB, or Ethernet. The PC running Cscape must be connected to the internet. An Ethernet connection from Cscape to the OCS is technically not required to transfer the license file. The connection can be serial or USB. However, an Ethernet connection is required later if transferring files via FTP and to test the WebMI feature. A common arrangement is to have the PC LAN port set up to talk to the OCS on its own subnet while the wireless connection on the PC is set to access the Internet.

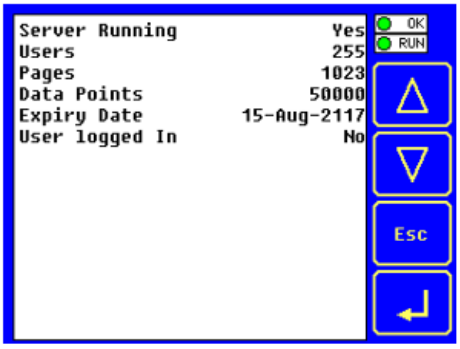
Alternately the PC and OCS can be on the same subnet with access to the broader network, which would negate the need for two separate Ethernet subnets. To do this typically requires that your IT department or internet service provider issue an IP address for the OCS.

Verify the WebMI License File Transfer

To verify that the license file has been transferred to the microSD card installed on the Horner controller, enter the System Menu on the unit and select Removable Media. The file **FIRMWARE.LIC** should be present. License Details can also be selected from the System Menu.

Images below: **System Menu > Removable Media** and **System Menu > License Details**





Alternately, WebMI status and license details can be viewed in system registers %SR209 and %SR218-222. The system registers are conveniently viewed in Cscape/Data Watch for RCC controllers that do not have displays.

WebMI Status Registers	
%SR209.3	WebMI server status. Bit 3 is ON if server running.
%SR209.4	WebMI user logged in status. Bit 4 in ON if 1 or more users logged in.
%SR209.9 to %SR209.16	Number of Users. Shows in upper byte in decimal format.
%SR218	Number of Web pages, license detail.
%SR219	Number of Data Points, license detail.
%SR220-%SR222	Expiry Date of WebMI License, license detail.

Chapter 8: Publish WebMI Pages

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Publication Steps

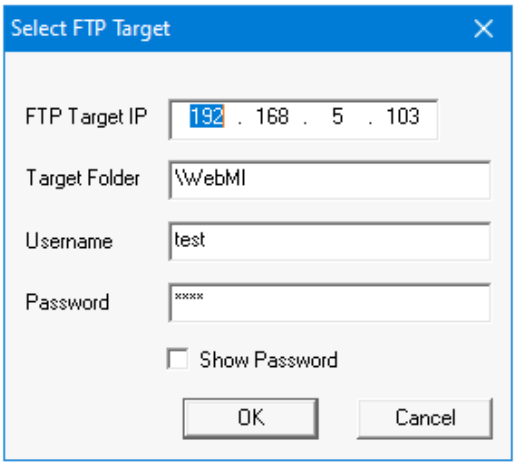
To publish WebMI Pages is to trigger Cscape to convert the user-created screens into HTML5 based web pages and save those pages to the PC hard drive. A secondary step included in the publishing process is to transfer the published pages via FTP over Ethernet to the OCS/microSD.

Publishing does not technically require that Cscape be connected to the OCS controller and does not require that the OCS be connected to the PC via Ethernet. However, by default Cscape expects that both of these connections are made prior to publishing. To avoid 'No Connection' warnings and extra steps, it is more efficient to establish an Ethernet connection to the OCS with FTP configured and be connected to the OCS with Cscape by any of the connection methods: serial, USB, or Ethernet.

To publish, open the **Graphic Editor** in Cscape.

From **Cscape 9.90 SP2** onwards, a new menu **WebMI** has been added in Cscape graphics editor.

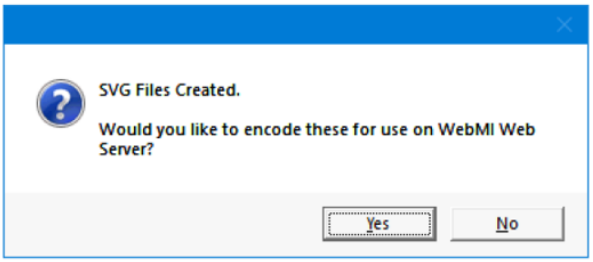
Selecting **Publish Web Site**, opens the following window:



The **Select FTP Target** dialog pops up first. Enter the IP address assigned in the OCS controller. The default Target Folder is **\WebMI**, which should be left as is. Enter the user name and password that is setup in the FTP configuration in **Home > Program > Hardware Configure > LAN Config**.

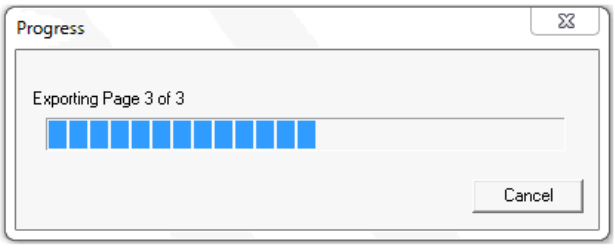
Select **OK** after making the configuration, the progress bar appears where in SVG files are created.

Upon clicking '**OK**', Cscape generates the HTML5 based SVG files (web pages that are based on the screens built in the Cscape Graphic Editor), and Cscape is now ready to encode the files for use with the WebMI feature. Click '**Yes**' to continue or click **'No**' to cancel the operation.

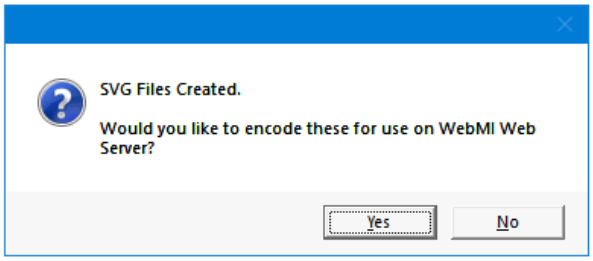


Now that the WebMI files have been published, you have two options for transferring the files to the Web Server (the OCS controller). You can transfer files via FTP, or you can manually transfer the files.

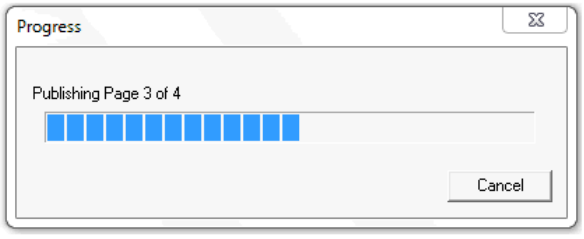
Cscape now asks if you would like to transfer the files to the Web Server via FTP. Click **Yes** to continue or if manual transfer is desired click **No** to cancel the operation.



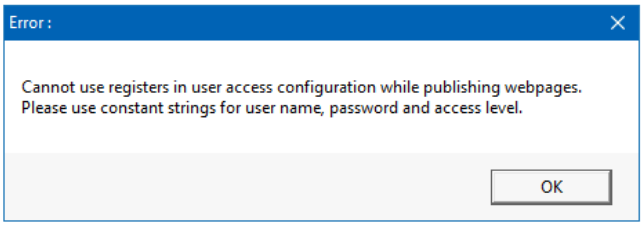
After the files are created, the following message box appears:



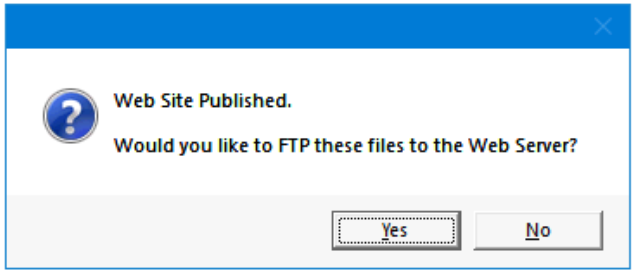
Selecting **Yes** publishes website if proper user access (i.e., constants) is configured in user access configuration.



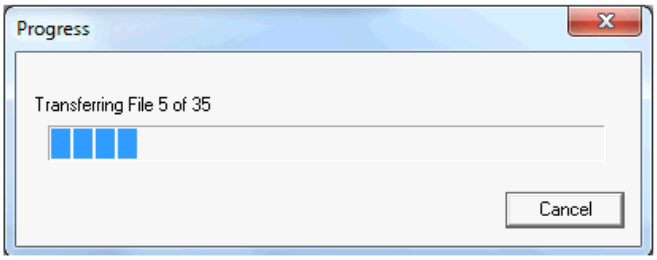
If user access is configured as registered, then the following error message appears:



After website is published, the message asks for FTP the files to the server.



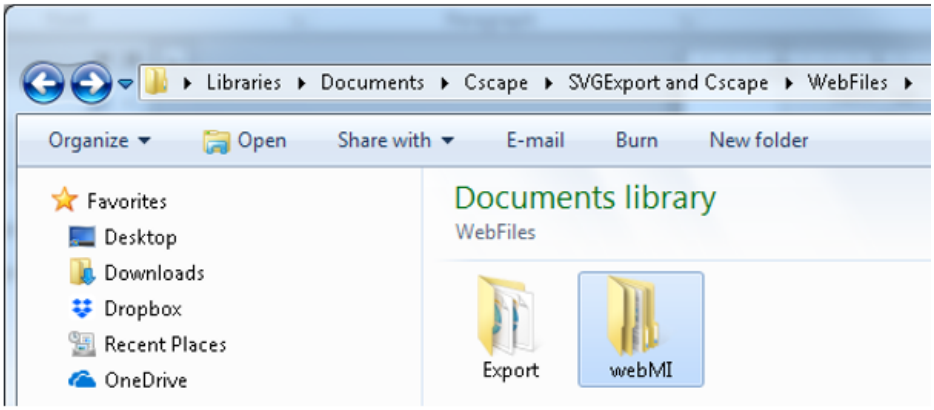
Selecting **Yes** starts FTP and the files are copied to the microSD card of the device.



Manual File Transfer

After encoding the SVG files for use with WebMI the web pages are now published, but not yet sent to the OCS/microSD. Cscape automatically places published files in the Windows My Documents folder at this default location shown below.

Web page SVG File Location:

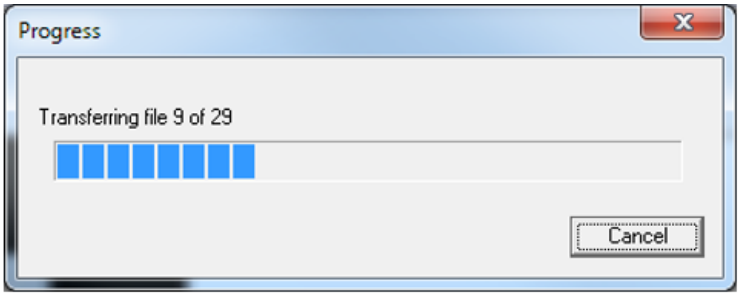


To transfer the files manually, install the microSD card into the PC. Copy the **WebMI** folder and paste it into the root directory of the microSD card. Then remove the microSD card from the PC and install it into the OCS controller.

Use FTP to Transfer Files

When Cscape asks 'Would you like to FTP these files to the Web Server?' click '**Yes**'. Cscape will then transfer the files via FTP.

See Below: FTP progress of a test program containing one screen. A larger program with several configured screens will have more files to transfer.



Chapter 9: Launch Web Site

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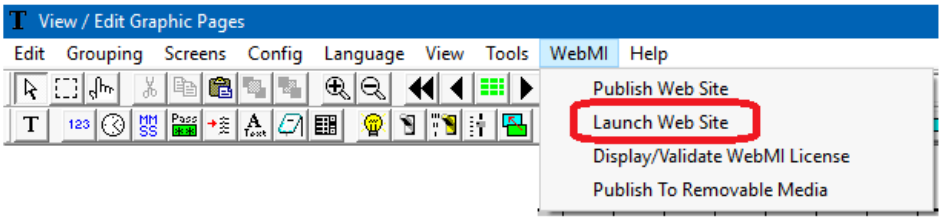
Launch from OCS Web Server

To launch the website from the OCS Web Server, enter the IP address of the OCS in the address field of a web browser such as Chrome, Microsoft Edge, or Firefox. If you can ping the OCS from your PC, then you have a valid Ethernet connection and should be able to launch the page. Alternately, you can launch the OCS Web Server from the Cscape Graphic Editor by clicking '**WebMI**' and then '**Launch Website**'.

When you first type in the IP Address of your OCS in your web browser or launch from Cscape, a connection procedure is initiated.

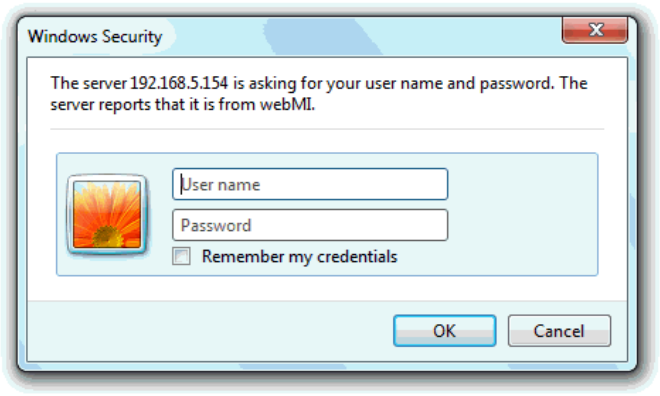
Step 1: Go to **Graphics Editor** and Select **WebMI > Launch Web Site**.



Step 2: User Name and Password credentials are requested and authenticated. These are the credentials you created in the User Security Configuration. This ensures that only authorized personnel can access the web pages and allows different access levels to be granted to users of different capability.

Selecting **Launch Web Site** opens the web pages in default browser and asks for user credentials. Give the user credentials configured in Cscape (i.e, **Graphic Editor - Config User Security Configuration**).

http://192.168.5.154/
Waiting for 192.168.5.154


Windows Security
The server 192.168.5.154 is asking for your user name and password. The server reports that it is from webMI.
User name
Password
Remember my credentials
OK
Cancel

Step 3: After giving the correct user credentials, clicking on **OK** takes to License agreement page where user needs to accept the license and then continue to view the pages.

The WebMI Usage License is accepted by the user. With a basic connection now established – the WebMI server in the OCS “serves up” graphics information along with a JavaScript Applet which runs on the browser as a WebMI Client. This provides the browser with everything it needs to know in order to draw the default OCS web page. The WebMI Client (JavaScript Applet running on the browser) and WebMI Server (running on the OCS) agree upon a connection timeout. This is the value that is set in Cscape: **Connection Time Out interval (sec)**

Step 4: The WebMI Client and WebMI Server go into data communications mode – where only the following messages are exchanged over the network – saving bandwidth:

- Current OCS data values for each of the Read/Only and Read/Write objects on the web page, requested by the WebMI Client running in the browser and provided by the WebMI Server on the OCS.
- **Heartbeat Messages** – Ensure the browser connection remains active.
- **Without heartbeat messages** – Mobile browsers will shut off the connection quickly to save bandwidth. This interval at which heartbeats are sent is set in Cscape as the Keep Alive Interval (ms).
- Changed data values for Read/Write objects, transmitted by the WebMI Client on the browser to the WebMI Server on the OCS. These are typically sent on a change of state basis as the user clicks buttons and updates data objects on the web page. The interval can be delayed by setting the Publish Interval (ms) parameter in Cscape to a non-zero value, but this is not recommended.

NOTE:

1. License Agreement page will not be displayed if there are no user editable fields in the WebMI project.
2. If editable fields are configured in WebMI project, then License Agreement page will be displayed only once i.e., once user accepts the license first project page will be displayed, again if same user logs in then License Agreement page will not be displayed and directly first project page will be displayed.

Launching Web Pages from Any Browser

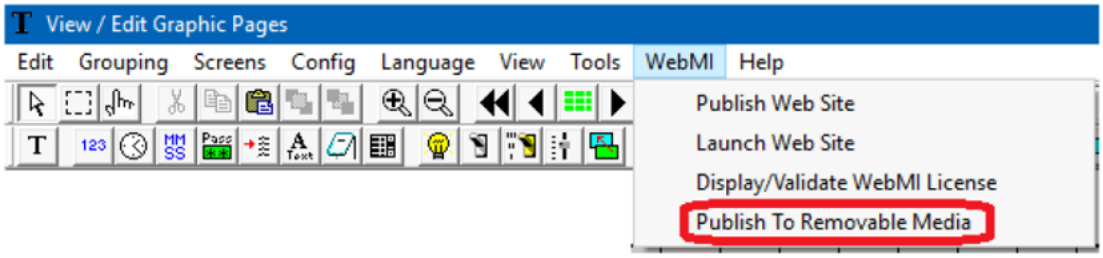
Open any web browser (IE, Chrome, Mozilla, Safari etc) from any device (iOS devices, android devices, windows devices etc). Give the IP address of the device (Same as FTP Target IP) on the address bar. Once the web browser connects to the device, it will ask for user credentials. Give user credentials and follow the procedure from Step 3, as explained above.

Any changes made in the website will be reflected on the device and vice versa.

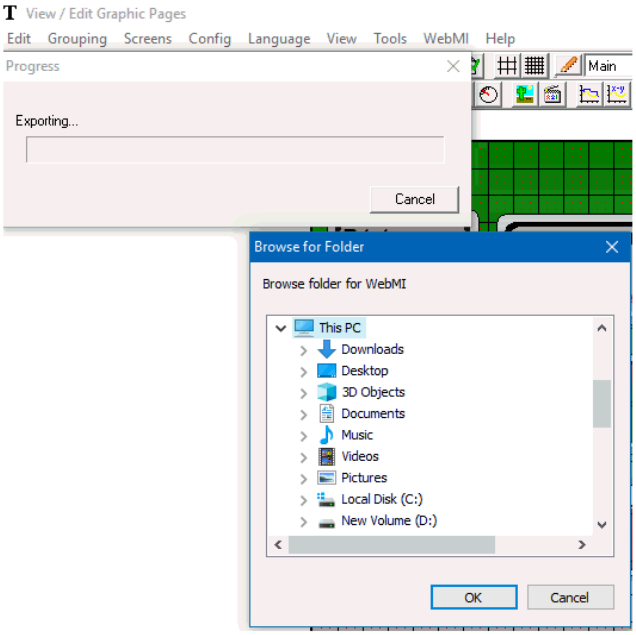
Publish to Removable Media

From Cscape 9.90 onwards, the WebMI folder can be directly published to removable media instead of using FTP for the web pages. In Cscape 9.90 SP2, in the **Graphic Editor**, select **WebMI > Publish to Removable Media** option.

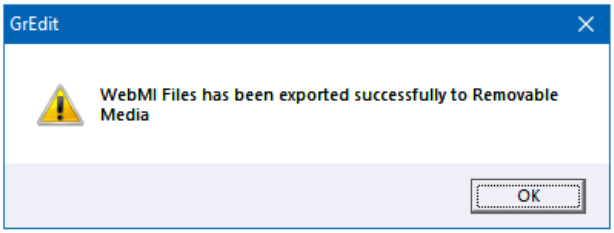
NOTE: In older versions of Cscape, this is found in the Edit tab.



The following windows will be displayed:



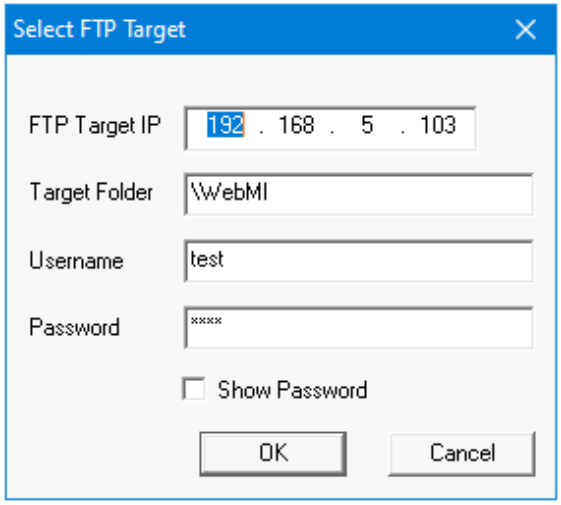
Browse the folder removable media to copy the web pages. Once path is selected, click on **OK**. Progress bar window for exporting and publishing pages will be displayed. Once web pages are copied to removable media, the following message will be displayed.



Import Tags

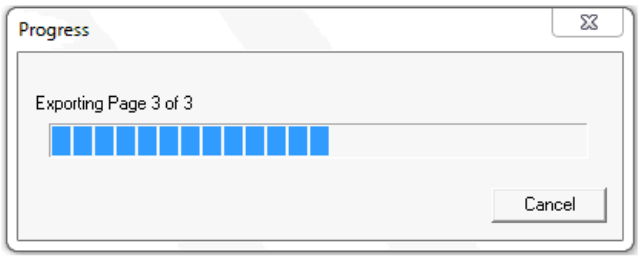
User will have to import tags before publishing (FTPing) web pages when using Web designer models for IEC and Advanced ladder with tags editor.

Select **WebMI > Publish Website** for Web designer models of IEC/Advanced ladder with tags editor.

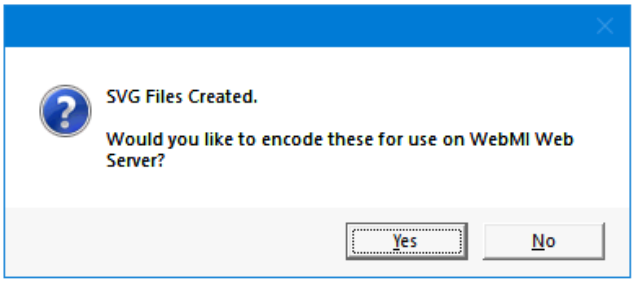


- **FTP Target IP** - IP address of the device that is configured in Hardware Configuration.
- **Target Folder** - This is the default folder where HTTP pages/SVG files are created in SD Card.
- **Username** - Username configured for FTP in Hardware Configuration
- **Password** - Password configured for FTP in Hardware Configuration.

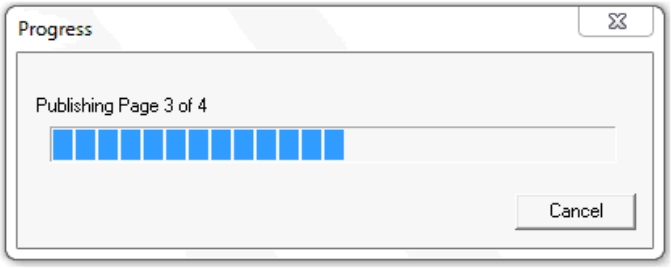
Select **OK** after the configuration, the following progress bar appears where in SVG files are created.



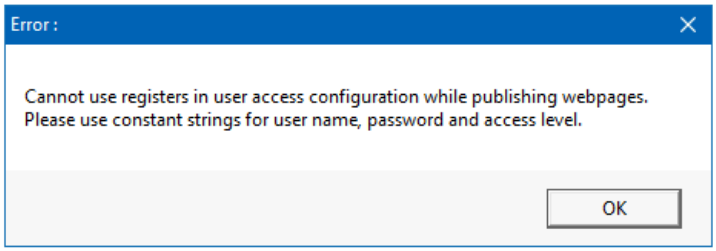
After the files are created, the following message box appears.



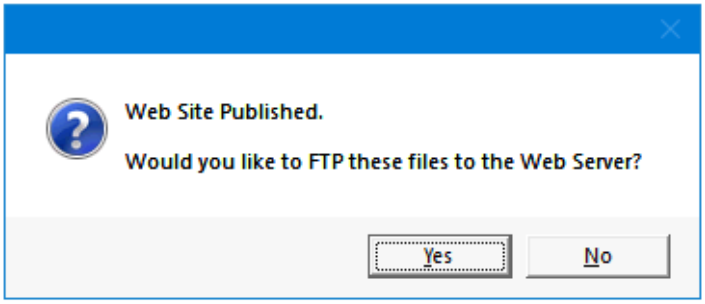
Selecting **Yes** publishes website if proper user access (i.e., constants) is configured in user access configuration.



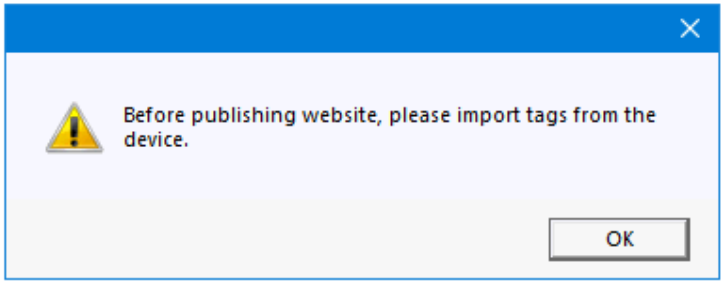
If user access is configured as registered, then the following error message appears:



After website is published, asks for FTP the files to web server.

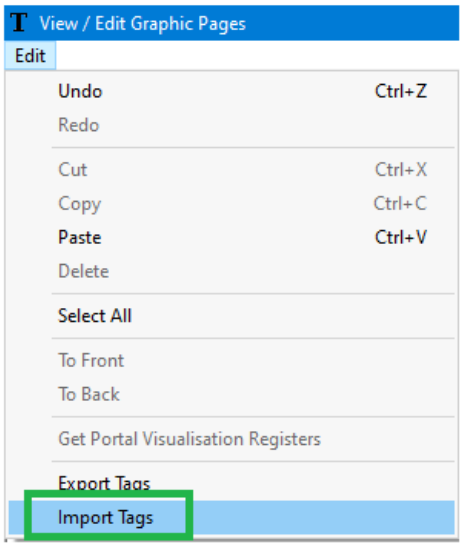


Selecting **Yes** displays the following window if tags are not imported before publishing the website.

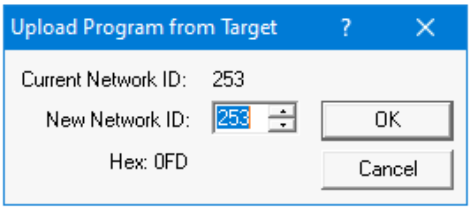


Click on **Ok**.

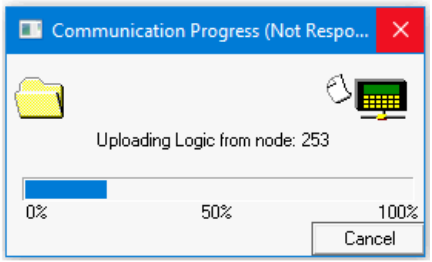
Select **Edit > Import Tags** from the graphics editor window.



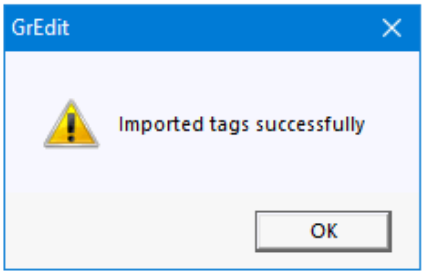
The following window will be displayed. Configure the Network ID and select **OK**.



After selecting **OK**, the following window will be displayed.



Once tags are imported, the following window will be displayed.



Again, select **WebMI > Publish Website** to publish the web pages to removable media. Select **Browse Website** to visit page.

Chapter 10: WebMI Limitations

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Limitations of Retentive Trend Type 53
Potential Problems with Trend Properties 54
Limitations on Alarms Object 55

Not Supported

The following graphics objects are not supported by WebMI:

1. Note Object
2. Trends – Standard Trend Type
3. Video Object
4. Recipes Object
5. Removable Media (Only A drive support is added)
6. RCC models do not support Alarms and Trends Objects

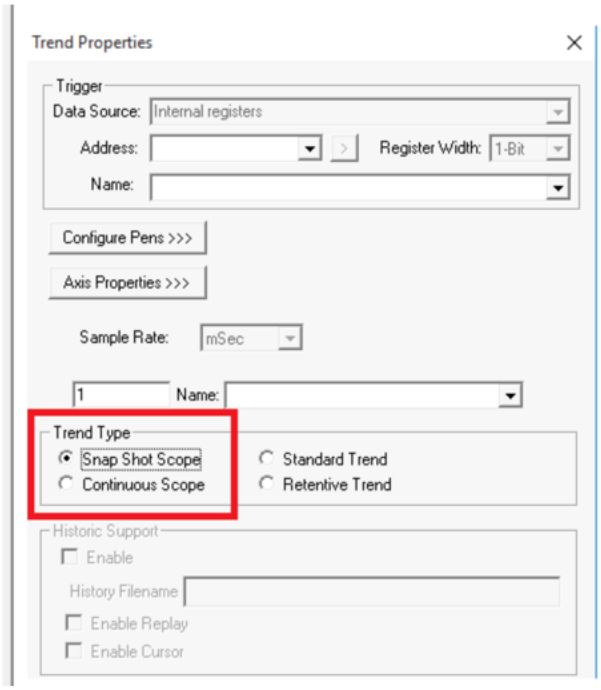
Limitations of Retentive Trend Type

1. Retrieval of historic data may be delayed depending on the amount of data being retrieved.
2. Retrieval of historic data may be slow depending on the speed of internet being used.
3. For supporting retentive trends user need to configure the same register with logging in the OCS downloaded program
4. Retentive trend has to be configured on OCS in order to be displayed on the WebMI:
    a. Pens has to match
    b. Time base (start & stop): any
    c. Sampling rate: preferable same, but if different sample rates are configured, then OCS should be equal or higher sample rate compared to WebMI

Potential Problems with Trend Properties

Potential problems with using Continuous and Snapshot scope Objects in Horner WebMI:

The **Scope Objects**, although available in the Horner WebMI system need special consideration.

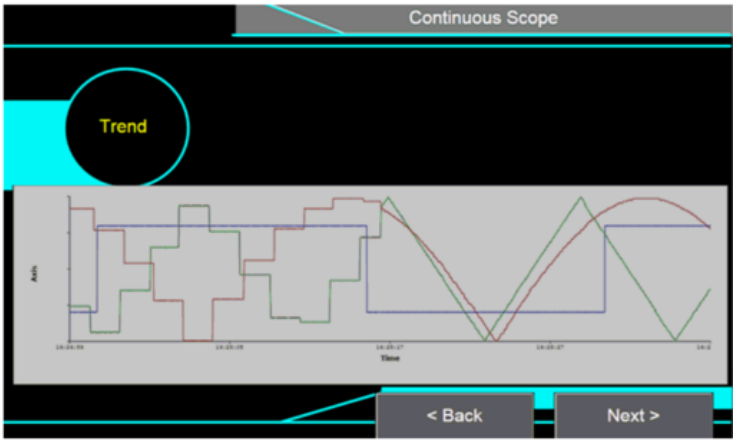


Problems in using these objects stem from the fact that the sample period can be set very low, as low as 10ms. The objects are updated by transferring values from the OCS running the WebMI system to the browser displaying the trend at the rate required, however there are a number of problems which can occur which would cause the update rate to be unachievable.

These problems would include:

1. **Intermittent Web Connection**: For example, where the connection is dropping many packets between OCS and browser.
2. **High Latency connections**: For example, GPRS modem connections where packets can take 20 seconds or more to travel from OCS to browser.
3. **OCS is in a high load situation**: For example, running logic with a very long scan time, or while displaying objects with high processor overheads such as the scope objects themselves or video objects

Typically, a system suffering from this problem would show a trend similar to the following:



Here the first half of the trend is filled whilst the OCS was running a very processor intensive graphics screen, and at the midpoint changed to much simpler graphics display.

Ways to counteract the problems:

1. Consider whether the scope objects are really applicable. Is it useful to have a trace of what happened to a set of values over a very short period at a remote location?
2. Select one of the other (standard/retentive) trend objects with much higher sample periods.
3. Reduce the sample rate of the scope type trends in use.
4. Increase the graphics time slice to as close to 50ms as the application will allow
5. Avoid multiple, simultaneous browser connections to the device where possible

Limitations on Alarms Object

1. Alarm text on Web designer models are replaced by alarm text of Cscape program that is downloaded to unit.
2. Alarm text on Web browser will not be readable if scaling of alarm object is not proper – expected aspect ratio is 4:3.

   NOTE: User must take care to configure alarm object, so that the alarm object is big enough to show the entire alarm text and acknowledge status.

3. Acknowledge All (**Ack All**), Clear (**Clr**) and Clear All (**Clr All**) states are not supported in Web browser.

Chapter 11: WebMI Troubleshooting

WebMI Troubleshooting - Cscape 56
WebMI Troubleshooting - WebMI 57

This troubleshooting section will focus on licensing, publishing, and client to browser connections. For the most part what you see in Cscape is what you get on the internet browser. There are a small few exceptions. For the most up to date list of supported graphic features please refer to the Cscape Help file.

WebMI Troubleshooting - Cscape

Cscape Messages	Description/Course of Action
Date on the device does not match with the license date. Please set correct date on Device.	The Real Time Clock date cannot be older than the date encoded in the license. Correct the date in the OCS. *NTP (Network Time Protocol) can be used keep the time and date updated automatically.
A Removable Media card is not present in the target device. The Removable media card is required for transfer of the license information. Please insert a Removable Media card into the device and try again.	Ensure that the functioning microSD card is present in the controller.
No users have been added to the User Access Table. As a result, once the project is published it will not be possible to log in to the WebMI. Do you still wish to proceed?	Ensure that at least one user is configured in User Security Configuration. **Graphics/Screen Editor > Config > User Security Configuration**
The request to connect to and log on to the FTP server failed.	While connecting, if any of the log-in credentials are not entered correctly or if there is no Ethernet connection, this message will appear. Check log-in credentials and ping response.
Device communications error. Check device connection and relaunch the graphics editor.	Cscape is not connected to the controller. Check Local and Target in the lower right-hand corner of Cscape for connection status. If developing in a Web Designer application, ensure that the Target number is set to the controllers CsCAN node ID.
C:\Users\name\Documents\Cscape\LicenseFiles\ firmware.lic was not found.	• Connect PC to internet and run Display/Validate WebMI license. Download license file when given the option. • Ensure that license file, FIRMWARE.LIC, is present on the microSD card. • Install microSD in OCS or replace faulty microSD card.
No License has been Issued to the connected device (MACIDxx:xx:xx:xx:xx:xx)	Obtain a valid license from: https://licensing.hornerautomation.com/ And install it on the microSD card of the device. See Section 5 on installing the license.
The License files on this unit do not match that on the server (or the device had been license but the license has not been applied to the unit). Do you want to Download the server license to the device?	Either manually copy the **FIRMWARE.LIC** file onto the microSD card of the device or select **Yes** and the license will be automatically copied onto the device.

WebMI Troubleshooting - WebMI	
Website Messages	**Description/Course of Action**
!!!Error!!! OCS is not in RUN mode. Please put the OCS in RUN mode to access the web pages.	Place the OCS in RUN mode and then refresh the browser.
404 **Not Found** Requested Entity:	Ensure that WebMI folder is present in root of microSD card before accessing web pages.
!!!Error!!! Date on the OCS does not match with the license date.	The date on the controller is before the purchased license date. Set the current time and date on the OCS.
This site can't be reached. (Chrome) **Or** This page can't be displayed (Windows IE)	Ensure all of the WebMI published files are present on the microSD and that the card is installed and functioning in the OCS.
401 Authorization Required	* Ensure that the username and password match that entered in User Security Configuration. * Cycle power to the OCS after publishing and transferring WebMI files.
!!!Error!!! Invalid license. Please install a valid license or contact Horner APG to purchase the license for this OCS.	Install valid license and refresh the web browser to access the web page.
Web pages on the OCS does not match with the web pages downloaded/built through Cscape. Please download/copy correct web page built through Cscape to OCS and put it in run mode to access the web pages.	If the FTP transfer stops during publishing, then the user needs to republish the WebMI files.
!!!Error!!! The target OCS license has insufficient credits. Please contact Horner APG to purchase a new license with ore credits for this OCS.	Either purchase higher credentials or configure according to the license purchased.
!!!Error!!! There is no valid program on the device. Please download a valid program to device and put it in run mode to access the web pages.	Download a valid program to device and put it in run mode to access the web pages.
Authentication Required A username and password are being requested by… The site says: "webMI"	Ensure that the correct username and password is given.