

# WebMI Manual for Horner Automation Controllers

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## Section 1: WebMI Overview

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.

**Table 1.1 – 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. <b>NOTE:</b> Information about Secure Connections is in the <a href="#">Appendix</a> .
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

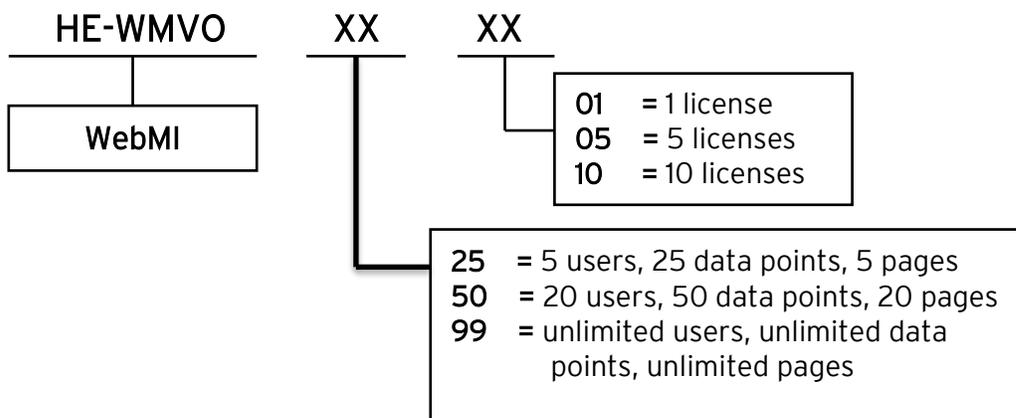
TLS Protocol	Transport Layer Security
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## Section 2: WebMI License

### License

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 Builder



A single license cannot be applied to multiple OCS units. However, there are currently options for 1, 5, and 10 license bundles. The last two digits of the part number define the number of licenses. **Example:** HE-WMV05005 (HE-WMI05005) indicates five (5) licenses at 20 Pages, 20 Users, and 50 Data Points each.

### Pages

These are the number of webpages 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. See 'Level Based Access' in Section 4.

### 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

### 1. Obtain a 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 login email address and the entered Horner OCS MAC ID.

### 2. Purchase a license - from <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>

### 3. Purchase a license - from an authorized Horner distributor

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

Distributors in **Europe** can be located by checking the Distributor Centre here: <http://www.horner-apg.com/en/distributors.aspx>

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.

## Section 3: Building Web Pages

### Overview

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 pre-defined 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.

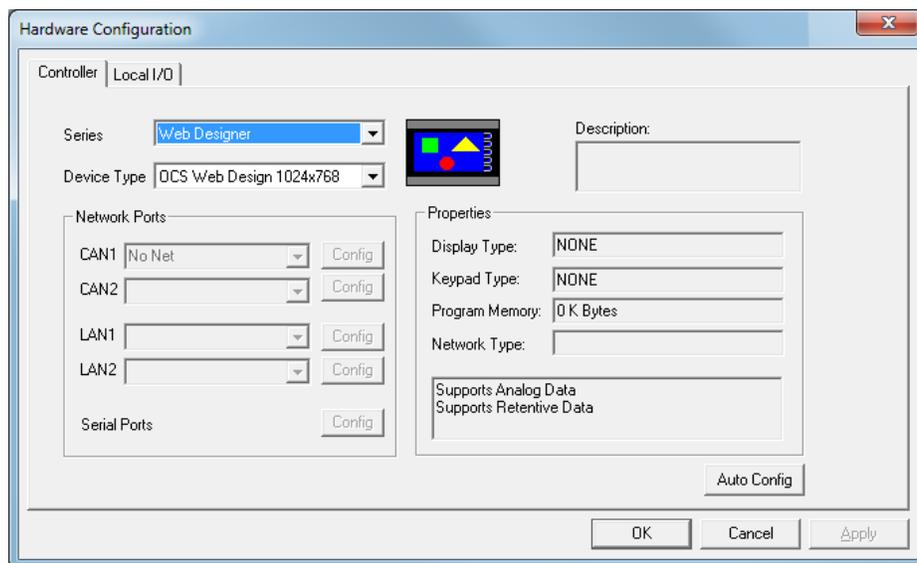
## Publish Pages from Web Designer

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.

**Example:** An XL4e may have five objects per screen spread across five screens, 25 objects total; with Web Designer one could put all 25 objects on one page for quicker more convenient viewing/editing.

A Web Designer program can also be used to build pages that fit within the license parameters if the main application exceeds the license on users, pages, and data points.



## Section 4: Setting up a Horner OCS for Use with WebMI

### Removable Media / USB / microSD File System

X, XL, and RCC controllers:

The microSD card memory slot uses the PC-compatible FAT32 file system supporting up to 32GB cards.

ZX controllers:

Support USB 2.0 up to 32GB.

XL+ controllers:

The microSD card memory slot supports SDHC, SDXC IN FAT32 format up to 128GB max.

### WebMI Ethernet Specifications

Table 1 - 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

### Ethernet Configuration - 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:

IP Address - 192.168.0.110

Subnet Mask - 255.255.255.0

Gateway - 0.0.0.0

Example PC:

IP Address - 192.168.0.99

Subnet Mask - 255.255.255.0

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.

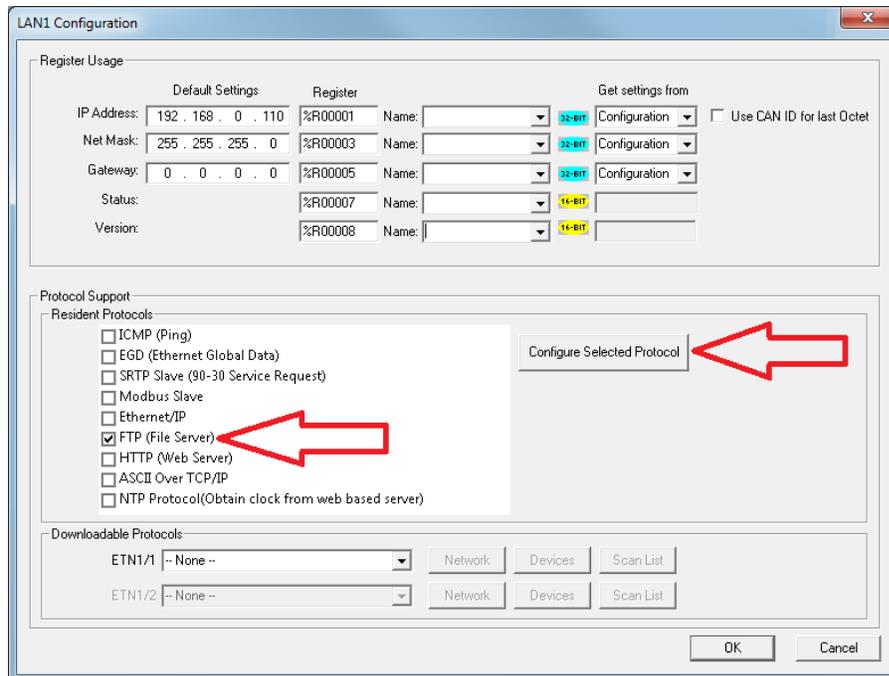
##### **Cscape LAN Config, Get Settings from - Register**

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.

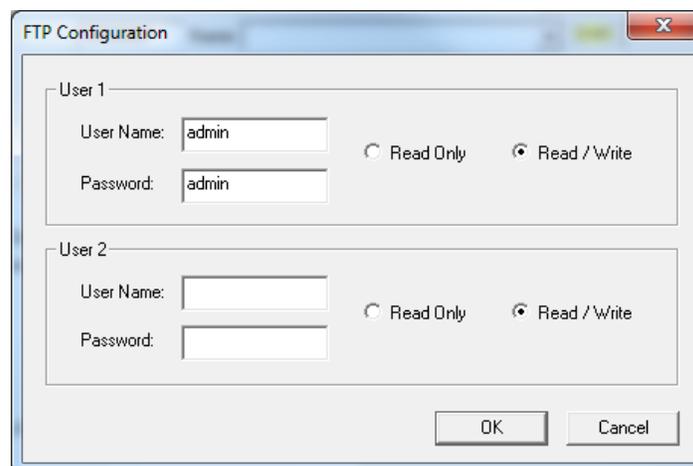
- The IP parameters are represented in System Menu / Set Networks
- The IP Parameters cannot be edited from System Menu / Set Networks while the unit is in Run Mode.
- The IP parameters always follow the values in the registers unless the OCS unit is placed in idle mode. Then the IP parameters can be 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 webpage files to the OSC removable media card via Ethernet. While it is not essential to use FTP to transfer the webpage 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 'Publish WebMI Pages' Section 6.



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.



## Level Based Access

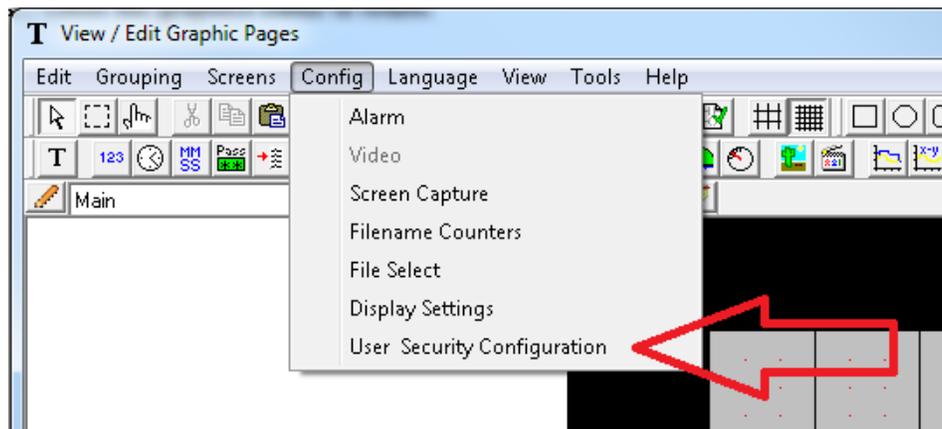
Level Based Access is a feature where a list of users can be created and configured with associated passwords and access levels. Graphic objects on the user screens can be configured to have an associated access level. This level will determine which users can interact with that screen object, based 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.

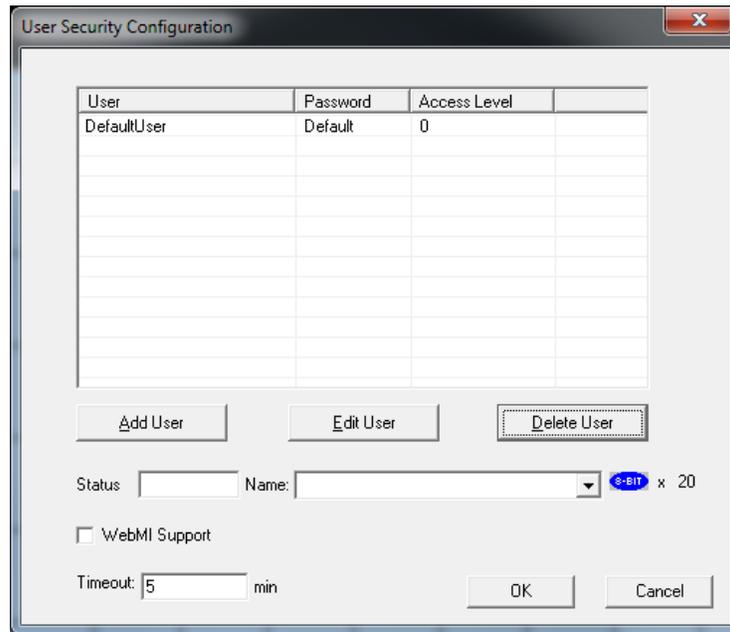
In a Web Designer application, the User Security Configuration is independent from the User Security Configuration in the main application. The User Security configurations between the main and the web designer do not have to match. Logins from the screen and from WebMI are monitored separately in the 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 username and password assigned in the User Security Configuration must be used. (Not the FTP User Name and password).

In the Graphic Editor. Select the 'Config' tab and click on 'User 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 username, 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

Status indicates who is logged in and for how long they have been logged in. The first 20 bytes (8-bit x 20) represent the user logged in directly from the OCS screen, not WebMI. The first 4 bytes show a running time of how long the user has been logged in. It is a double word viewed in DINT format. The remaining 16 bytes contain the logged in user name in ASCII format.

Example:

%R1000 + %R1001 = Running logged in Time (%R1000, format DINT)  
 %R1002 to %R1009 = Username. (%R1002 - 1009, format ASCII)

## WebMI Support

When the WebMI Support box is checked an additional 80 bytes of status are added starting at the 11th word where the local device status leaves off. These 80 bytes show logged in WebMI users. Since four (4) connections are possible at a time, 80 bytes are used. The extra WebMI status is optional. WebMI does not require that the 'WebMI Support' box be checked.

### Examples:

%R1010 to %R1019 - 1st connection / 1st user i.e., %R1010 + %R1011 = running time for 1st connection / user and %R1012 to %R1019 = 1st logged in username in ASCII format.

%R1020 to %R1029 - 2nd connection / 2nd user i.e., %R1020 + %R1021 = running time for 2nd connection / user and %R1022 to %R1029 = 2nd logged in username in ASCII format.

%R1030 to %R1039 - 3rd connection / 3rd user i.e., %R1030 + %R1031 = running time for 3rd connection / user and %R1032 to %R1039 = 3rd logged in username in ASCII format.

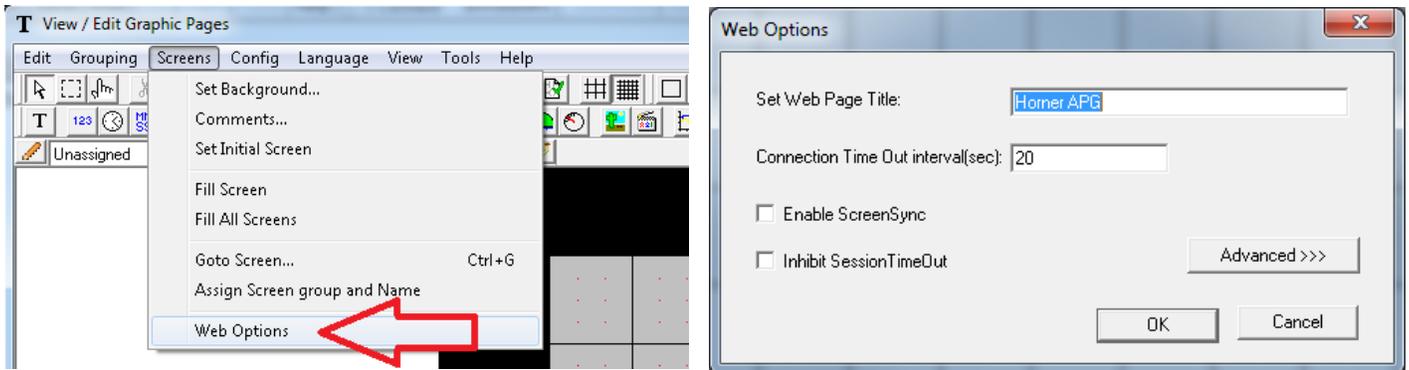
%R1040 to %R1049 - 4th connection / 4th user i.e., %R1040 + %R1041 = running time for 4th connection / user and %R1042 to %R1049 = 4th logged in username in ASCII format.

## 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.

## Web Options

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



### 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

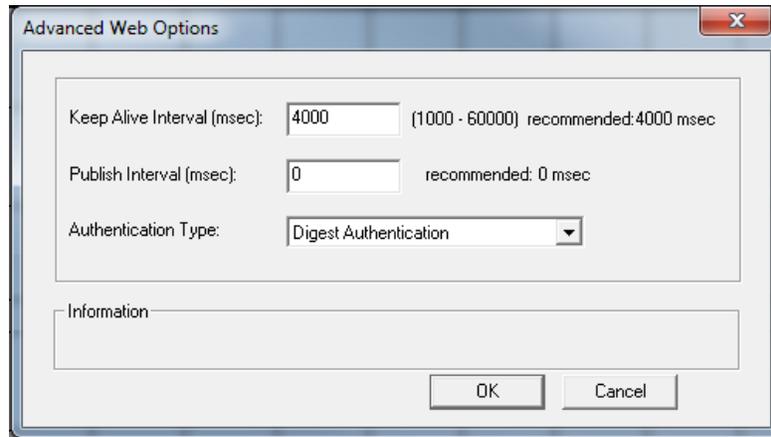
For applications where the WebMI web pages are duplicates of screens in the OCS, this allows screen changes made remotely on the browser to cause screen changes locally on the OCS and vice-versa. This is analogous to the functionality you get with Windows Remote Desktop but with an OCS instead of a computer. 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>>>** in the Web Options dialog displays the following window:



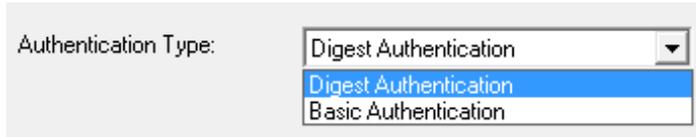
### Keep Alive Interval (ms)

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



The screenshot shows a web interface with a label 'Authentication Type:' followed by a dropdown menu. The dropdown menu is open, showing three options: 'Digest Authentication' (selected and highlighted in blue), 'Digest Authentication', and 'Basic Authentication'.

Digest and Basic authentication types are supported. Webserver uses the selected authentication for user login.

### 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 connections which do not support Digest Authentication.

## Cscape to OCS Connection

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

- |                 |  |
|-----------------|--|
| <b>Serial</b>   | The default serial programming port is MJ1.  |
| <b>USB</b>      | 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. |
| <b>Ethernet</b> | 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 hardware manual.

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

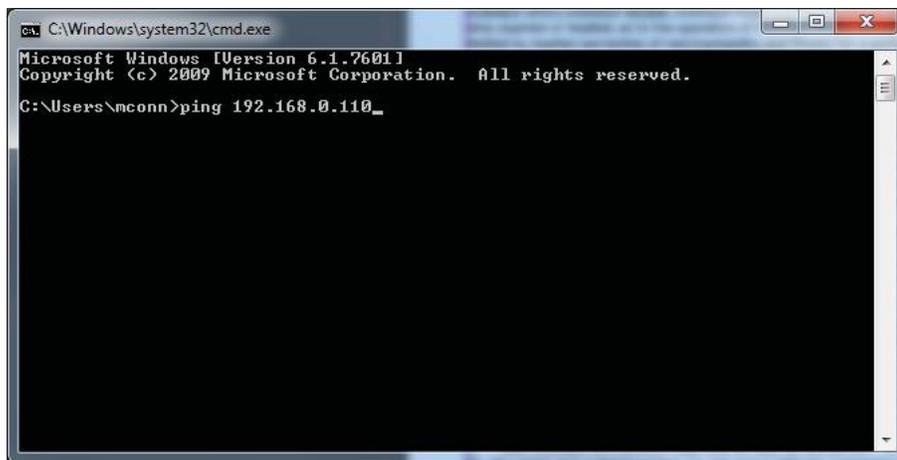
When the logic, protocols, screens, and hardware configuration are completed to satisfaction download the application to the OCS.

Program Checklist:

1. There should be a completed Ethernet setup in LAN1 configuration.
2. FTP should be checked under Resident Protocols and User Name and Password assigned in the LAN1 configuration. (If FTP is to be used to transfer the WebMI pages).
3. There should be a Password and User Name 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".

## Section 5: 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.

### Transfer the license file manually

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 filename is different for every license and includes the MAC ID of the licensed device. Example filename: WebMILicense-00EOC404c625.

### Transfer the license file to the microSD card manually

First rename the file. The filename 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.

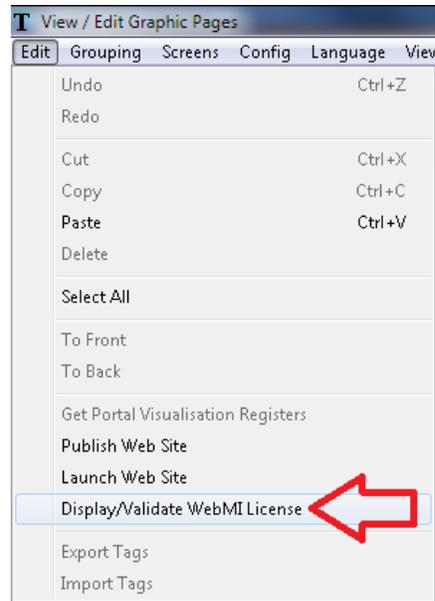
### Let Cscape transfer the file

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.

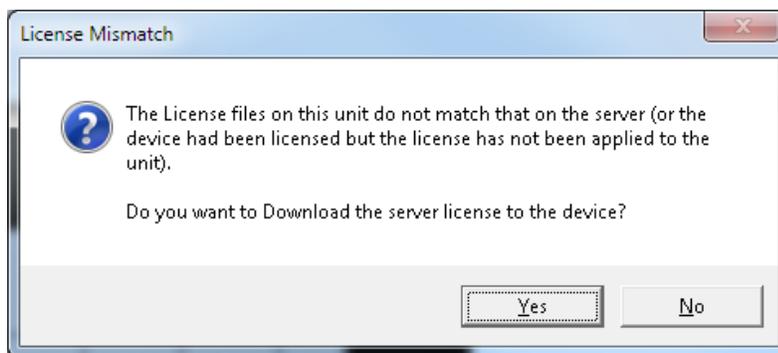
Perform the following steps to let Cscape transfer the file.

1. In Cscape open the Graphic Editor, click Edit at the top, click Display / Validate WebMI License.



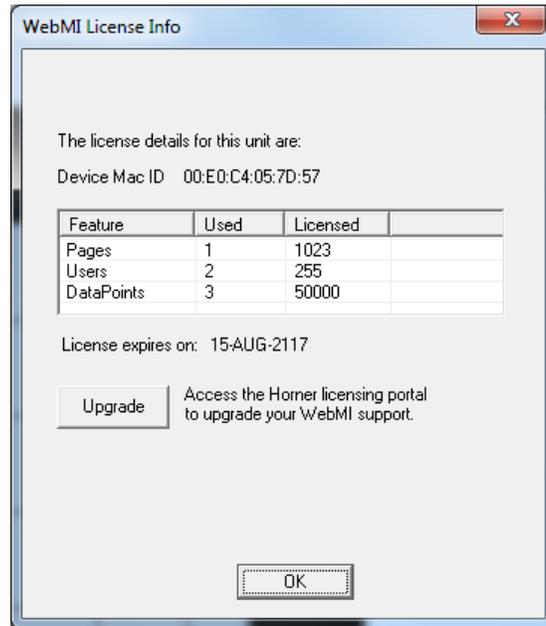
2. The following message will pop up if:
  - \*The license file is not yet on the microSD card.
  - \*The OCS MAC ID is not correct for the license file that is already on the microSD card.

Click Yes to download the license file to the OCS with installed microSD card.



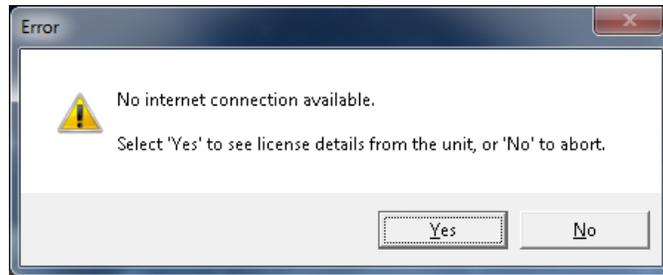
Clicking 'Yes' triggers Cscape to connect with the Horner WebMI site via internet connection. The license file is retrieved and sent to the OCS/microSD via whatever connection method is being used whether it is serial, USB, or Ethernet.

3. When a valid license is found and sent to the OCS, the WebMI License Info is displayed. The MAC ID of the connected OCS device, the license details, and the Pages, Users, and Data Points used are shown. From this window, the WebMI license could be upgraded if desired. Clicking Upgrade will launch a web browser directed to the Horner WebMI website (**internet connection required**).

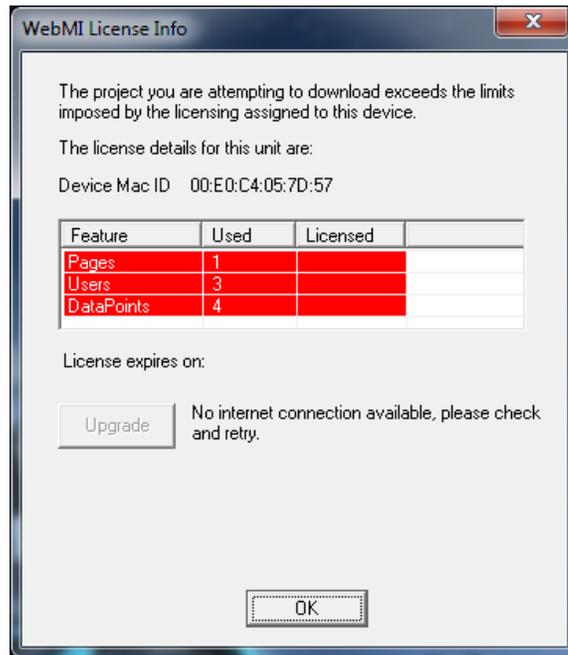


Shown: Unlimited license with 1023 Pages, 255 Users, and 50,000 Data Points.

**NOTE:** If the PC is not connected to the internet when Display / Validate License is selected, Cscape cannot reach the WebMI server to validate the license. The 'No internet connection available message will be shown.'



Click 'Yes' to obtain license details from the unit. If the license file has not already been transferred to the unit (because it was not retrieved due to no internet connection), the license details will appear in red.

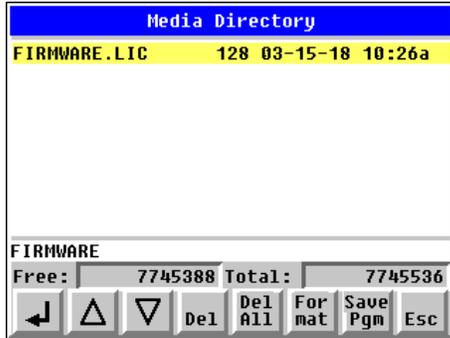


For existing WebMI applications where the license file has already been transferred to the unit, but the PC is not connected to the internet, the WebMI License Info will be retrieved from the unit and display normally showing used and licensed details.

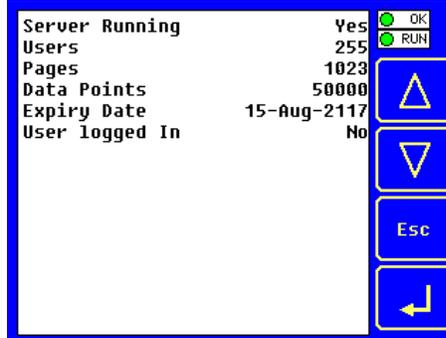
If no internet connection is currently available, then transfer the license file manually.

## 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.



Removable Media from System Menu



License Details from System Menu

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

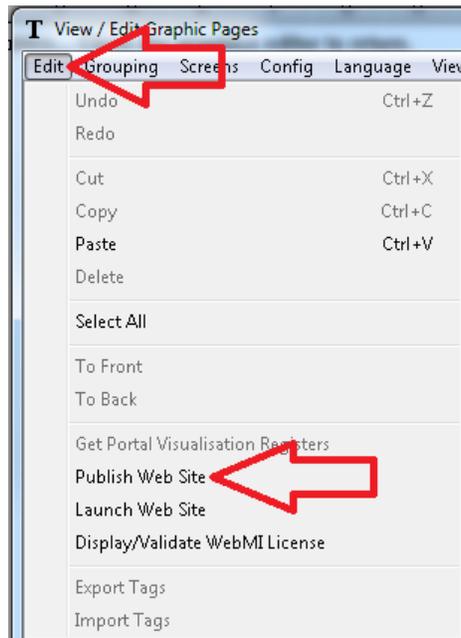
Table 1 - WebMI Status Registers	
%SR209.3	WebMI server status. Bit 3 is ON if server running.
%SR209.4	WebMI user logged in status. Bit 4 in ON if 1 or more users logged in.
%SR209.8 to %SR209.16	Number of Users. Shows in upper byte in decimal format.
%SR218	Number of Webpages, license detail.
%SR219	Number of Data Points, license detail.
%SR220-%SR222	Expiry Date of WebMI License, license detail.

## Section 6: Publish WebMI Pages

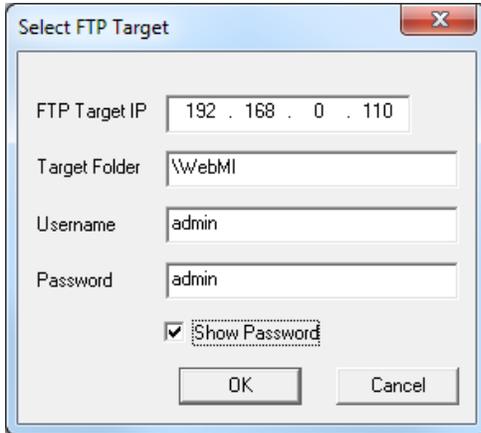
To publish WebMI Pages is to trigger Cscape to convert the user-created screens into HTML5 based web pages and save those pages to the PC hard drive. A secondary step included in the publishing process is to transfer the published pages via FTP over Ethernet to the OCS / microSD.

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.

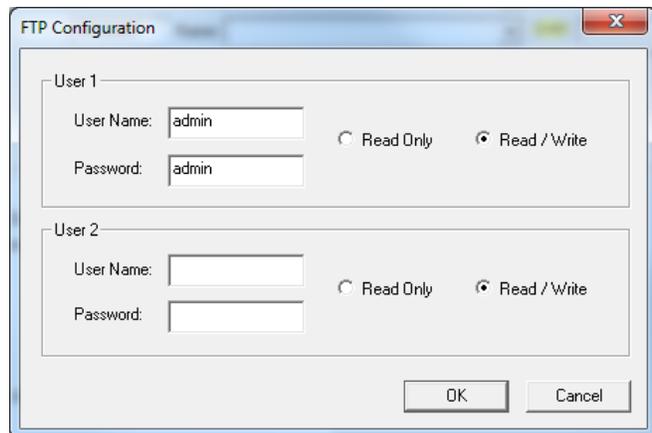
To publish, open the Graphic Editor in Cscape, click Edit, and then click Publish Website.



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 **Cscape → Hardware Configure → LAN Config**. Verify correct FTP Target IP and FTP credentials and click 'OK'.

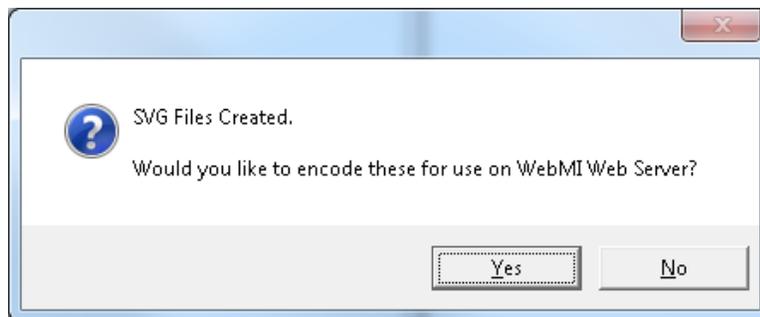


Select FTP Target



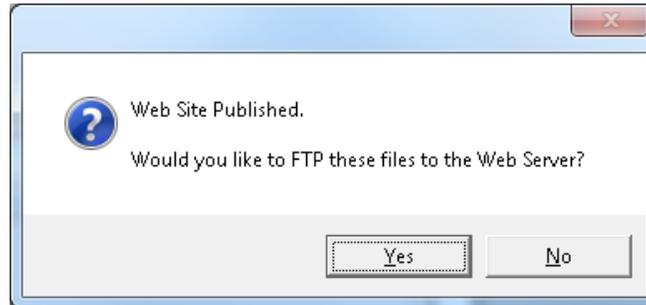
Use the credentials from FTP Configuration in FTP Target.

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.



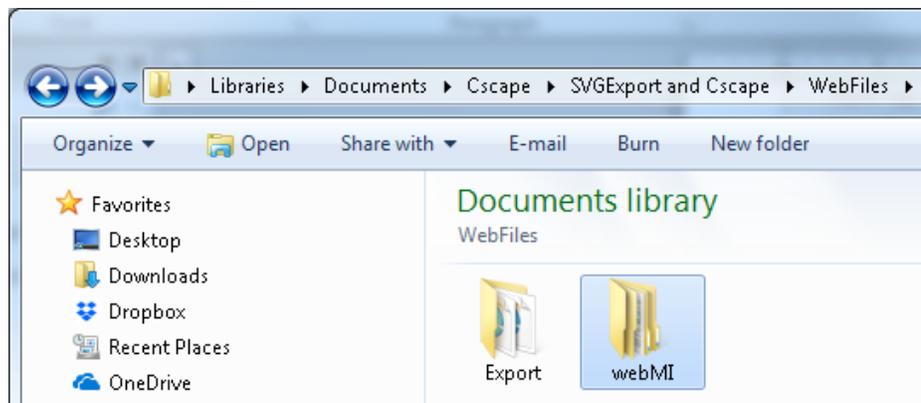
Now that the WebMI files have been published, you have two options for transferring the files to the Web Server (the OCS controller). You can transfer files via FTP, or you can manually transfer the files.

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.



## 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.



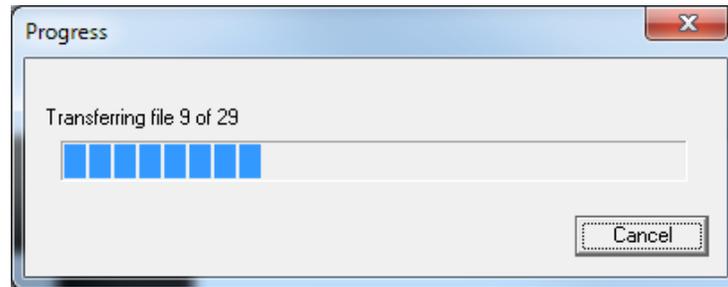
Webpage SVG File Location

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.

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



## Section 7: Using WebMI

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, Internet Explorer, 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 Cscope Graphic Editor by clicking 'Edit' and then 'Launch Website'.

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

- a. 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.
- b. 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 Cscope: Connection Time Out interval (sec)
- c. 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 - ensuring 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 Cscope 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 Cscope to a non-zero value, but this is not recommended.

## Supported/Not Supported

The following graphics objects are not supported by WebMI:

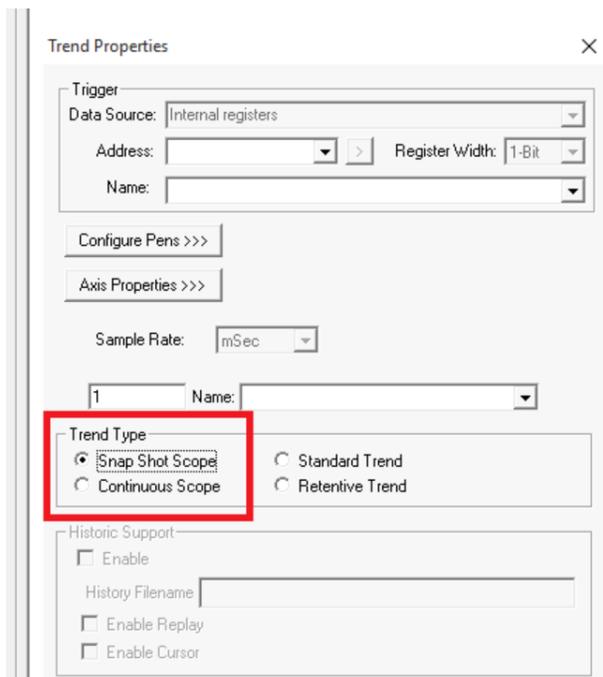
1. Note Object
2. Trends - Standard Trend Type
3. Video Object
4. Recipes Object.
5. Removable Media (Only A drive support is added).
6. RCC models do not support Alarms and Trends Objects.

### 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 using Continuous and Snapshot scope Objects in Horner WebMI:

The scope objects, although available in the Horner WebMI system need special consideration.



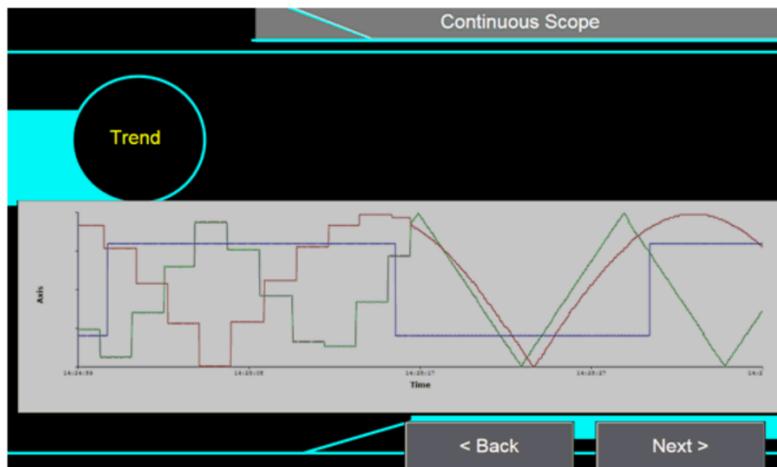
Problems in using these objects stem from the fact that the sample period can be set very low, as low as 10ms.

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.

## Section 8: Troubleshooting

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.

Table 2 - 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. <b>Graphics/Screen Editor → Config → User Security Configuration</b>
The request to connect to and log on to the FTP server failed.	While connecting, if any of the login credentials are not entered correctly or if there is no Ethernet connection, this message will appear. Check login 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, insure 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: <a href="https://licensing.hornerautomation.com/">https://licensing.hornerautomation.com/</a>  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 <b>FIRMWARE.LIC</b> file onto the microSD card of the device or select Yes and the license will be automatically copied onto the device.

Table 3 - Troubleshooting - Website	
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 <b>Not Found</b> 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)  <b>Or</b>  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 User Name 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.
Webpages on the OCS does not match with the webpages downloaded/built through Cscape. Please download/copy correct webpage 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.

## Section 9: Technical Support

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Email: [techspt@heapg.com](mailto:techspt@heapg.com)

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### Europe:

## Section 10: TERMS AND CONDITIONS OF USE Policy

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UPDATED April 25th, 2018

#### HOW TO CONTACT US

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## Appendix: 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. Refer to Table 1.1 in [Section 1](#).

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.

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