P-300 WEB CONTROLLER
CONFIGURATION AND TROUBLESHOOTING MANUAL

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- Read this manual carefully before using the equipment.
- Familiarize yourself with all safety precautions before using the equipment.
- Keep this manual handy for future reference.

ESPEC NORTH AMERICA, INC.

Table of Contents

1.1 P-300 Communication Settings

Delimiter	CR and LF
Transmission	9600 bps
Parity	None
Data Bits	8bit
Stop Bits	1bit
Protocol	STND

1.2 Connecting to the Chamber for Debugging Purposes

Debugging information is accessed through the center serial port (mini Din8 connector) of the gumstix board. Connecting a PC to this port allows you to monitor any debugging information printed by the polling service. To connect to the serial port, use the following settings:

Speed	115200
Data Bits	8
Stop Bits	1 bit
Parity	None
Flow Control	None
Stop Bits	1 bit
Protocol	STND

To connect to the web server serially, you will need to use a null modem cable and connect to the middle port on the gumstix board, as shown in the image below. Connect the DB9 end of the cable to the serial (COM1) port of your PC.

For further explanation of the steps to follow to connect and communicate serially, follow steps 1-10 of the “Web Controller Firmware Download Procedure” document.

1.3 Web Browser Alert Box Listings and Descriptions

Page	Message	Meaning
Monitor	Your download is being prepared. It may take a few seconds to start.	This message exists to inform the user that generating the CSV file for download does take a noticeable amount of time (depending on the log size).
Constant	Error handling: [item list]	This message is rare and should not be encountered in a normal environment. It is not normally a user-serviceable issue.
Constant	Constant settings saved.	Informs the user that their settings have been saved.
Edit Program	An error occurred while saving the program ([error code]). Entered data for a program step is out of range. Hours must be in the range 0-999, minutes must be 9-59, humidity must be 0-100, and product temperature control deviation must be 0-100. Ramp and soak control cannot be selected at the same time for any step.	The error code is for factory diagnostics only. It varies based on the error code returned by the chamber. The web serve does not know anything about this code. This message informs the user that they have entered some incorrect data into their program.
Edit Program	Program was saved.	Informs the user that the program was successfully saved.
Edit Program	The maximum number of steps is 99.	This informs the user that no more than 99 steps can be added to a program.
Edit Program	Programs may not be downloaded to the chamber controller when the TCP forwarder is in use. The program has not been downloaded to the chamber controller. To save the program, save it to the computer's hard drive then upload it once the device(s) using the forwards have disconnected.	Informs the user the TCP forwarder is enabled and in use. When the TCP forwarder is in use no programs may be downloaded to the chamber.
Edit Page	ERROR: No program specified to load.	This happens when a user visits the program editing page directly without passing the appropriate "GET" arguments. Under typical usage conditions, this will not occur.
Monitor Page	Unable to reset the graph, please reload the page.	This only occurs when there is a problem redrawing the graph on the monitor page. In the case where reloading doesn't work, the user needs to refresh the page manually when they want to see new data.
Monitor Page	Invalid Scale, must be greater than 0.	This error message won't show up. The "scale" function it is tied to was hidden for debugging purposes only.
Program Page	Cannot erase ROM programs (21 to 30).	This error appears when we try to save to a ROM program slot.

Program Page	Program failed to delete.	This error appears when we fail to delete a program.
Program Page	This program hasn't been defined yet.	This error appears when we attempt to delete a program which is “Undefined”.
All Pages	General exception and stack trace.	This error appears when there is an unhandled exception in the server Ruby code. This is enabled for beta and other debugging and should be turned off before going to production.
All Pages	DEBUG: No handler defined for [item].	This error only shows up when there is a miss-configuration in software concerning fields on the right column which display chamber data. This should never show up for the end user.
Setup Page	Name must be at least one character long.	This error appears when the user tries to enter a Time Signal name of length zero.
Setup Page	[Name] failed.	
Setup Page	You entered the wrong passcode.	This appears when trying to save network settings or e-mail settings and the wrong passcode has been entered.
Setup Page	Something went wrong when trying to save the network settings. Please check the network settings and try again.	This appears when trying to save network settings and bad settings have been input.
Setup Page	Something went wrong when trying to save the e-mail settings. Please check the e-mail settings and try again.	This appears when trying to save e-mail settings and bad settings have been input.
Setup Page	Error changing passcode. The current passcode supplied was incorrect.	When changing the passcode and the old passcode is entered incorrectly, this message appears.
Setup Page	Error saving chamber name.	This appears when there is a problem saving the chamber name.
Setup Page	TCP forwarder settings saved.	

1.4 Manually Clearing Trend Graph History

For older versions of web server firmware that do not have the “Clear Log Data” button, follow the procedure below.

Trend graph history can be cleared by first powering down the gumstix device, then moving the microSD card into a microSD card reader on a Linux machine (or any other machine which can read ext2 file systems) and removing every file ***except*** Cleanup.rb in the directory /espec/log/.

The following commands can be run to do this:

Mount [microSD device] [mount point]

cd [mount point]

rm espec/log/chamber_*

Unmount the micro SD card and return it to the gumstix device.

Note: Many modern Linux distributions will mount the microSD card for you and put a link to it on your desktop.

1.5 Web Server Firmware Revision

To find out what version web server firmware you are running, navigate to http://X.X.X.X/version.txt (where X.X.X.X is the IP address of the web server device you are connected to).

1.6 Input Field Restrictions

1.6.1 Constant Mode Setup

Temperature Setpoint	Numbers within the chamber’s temperature range.
Humidity Setpoint	Numbers within the chamber’s humidity range.
Deviation Limit	Positive numbers within the chamber’s deviation limits.

1.6.2 Program Editor

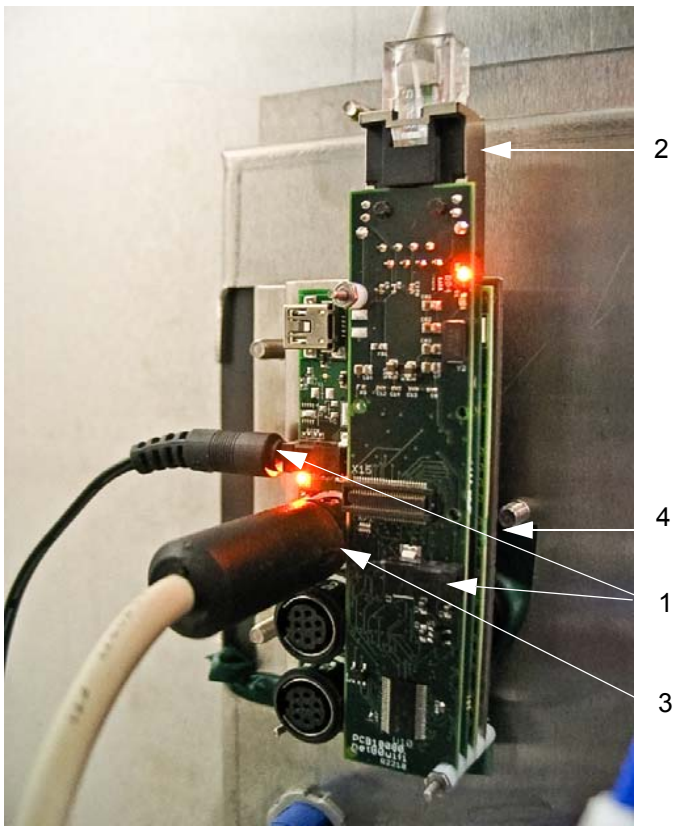
Program Name	14 characters, no spaces.
Temperature	Numbers within the chamber’s temperature range.
Humi	Numbers within the chamber’s humidity range.
Time Hours	0 to 999
Time Minutes	0 to 59
Product Control Deviation Limits	Positive numbers within the chamber’s deviation limits.

1.6.3 Device Configuration

Chamber Name	Any combination of numbers and letters. Note: symbols are allowed. HTML tags can be embedded in the name.
IP Address	Any valid IP address.
Netmask	Any valid network mask.
Gatway	Any valid IP address.
DNS 1	Any valid IP address.
DNS 2	Any valid IP address.
SMTP Host	Any valid hostname or IP address.
SMTP Port	Any valid port number (1 to 65535).
SMTP User	Any valid SMTP user name.
Send E-mail as	Any valid e-mail address.
Alert Addresses	Any line-separated list of e-mail addresses.

1.7 Hardware Connection & Installation Details

1. Power supply connection (2 power plugs to choose from)
2. Ethernet connection (to the Ethernet connector mounted in the option panel)
3. P-300 Web Control RS-232 Serial Cable connection to P-300 main board.
4. Micro SD card installation slot, in gumstix board



1.7.1 Hardware Installation Procedure

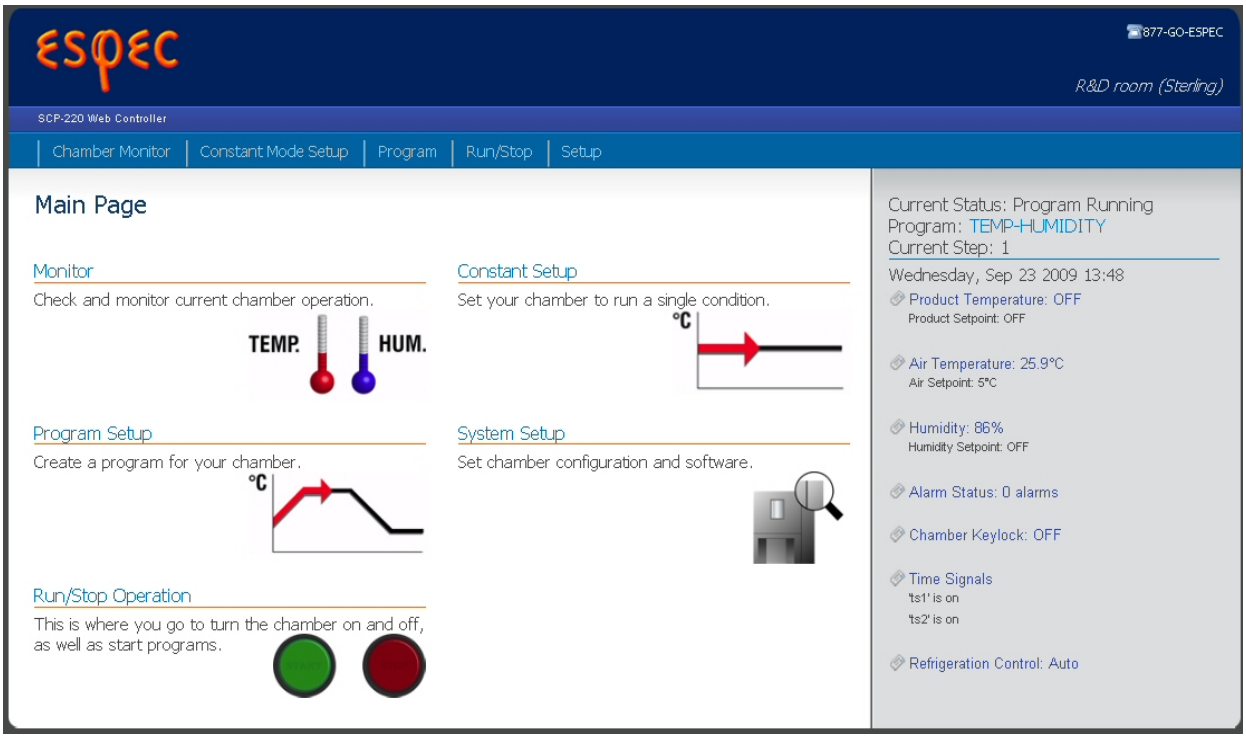
Use the following steps for a web server option installation:

1. Turn all power off to chamber before starting.
2. Mount the web server assemly onto the I/O Boards, using stand offs.
3. Connect the P-300/Web Control RS-232 communications cable between the P-300 main board connector CNM22 and the serial connection on the web server (labeled #3 on the image above).
4. Connect the Ethernet cable between the web server Ethernet connection (labeled #2 on the image above) and the Ethernet port that goes to the outside of the chamber.
5. Install the web server firmware micro SD card, if it is not already installed. It slides into a small slot on the “middle” gumstix board (labeled #4 on the image above).
6. Connect the gumstix power supply to the receptacle on the chamber electrical panel and plug the power connector into one of the gumstix power supply connection plugs (labeled #1 on the image above).
7. Turn power back on to the chamber.

1.7.2 Hardware Installation Verification

Use the following steps to verify the functionality of a web server option installation:

1. Make sure that all cables and connections are made properly for the web server option.
2. Turn on power to the test chamber, which will apply control power to the SCP-220 controller and the web server device.
3. Turn on the P-300 HMI.
4. After about 30 seconds, you should see the communications light under the P-300 HMI start to blink. It should blink on and off once about every 60 seconds after RS232 communications has been established between the SCP and the web server.
5. Connect a PC directly to the Ethernet port on the chamber, using a cross over cable.
6. Start the PC directly to the Ethernet port on the chamber, using a cross over cable.
7. After about another 30 seconds (following step 4), you should start to see the green LED on the Ethernet connector for the gumstix turn on solid and the yellow LED should start to blink. If these LEDs are not correct, turn off chamber power and go back to step 1 of this process (check all cables and connections). If you still can't get the Ethernet port comms to work, call service for help.
8. Enter the following IP address into the web browser on your PC http://192.168.0.83/.
9. The web server should open up the main page, and it should show the status of the chamber on the right status bar of the web page (as shown below).

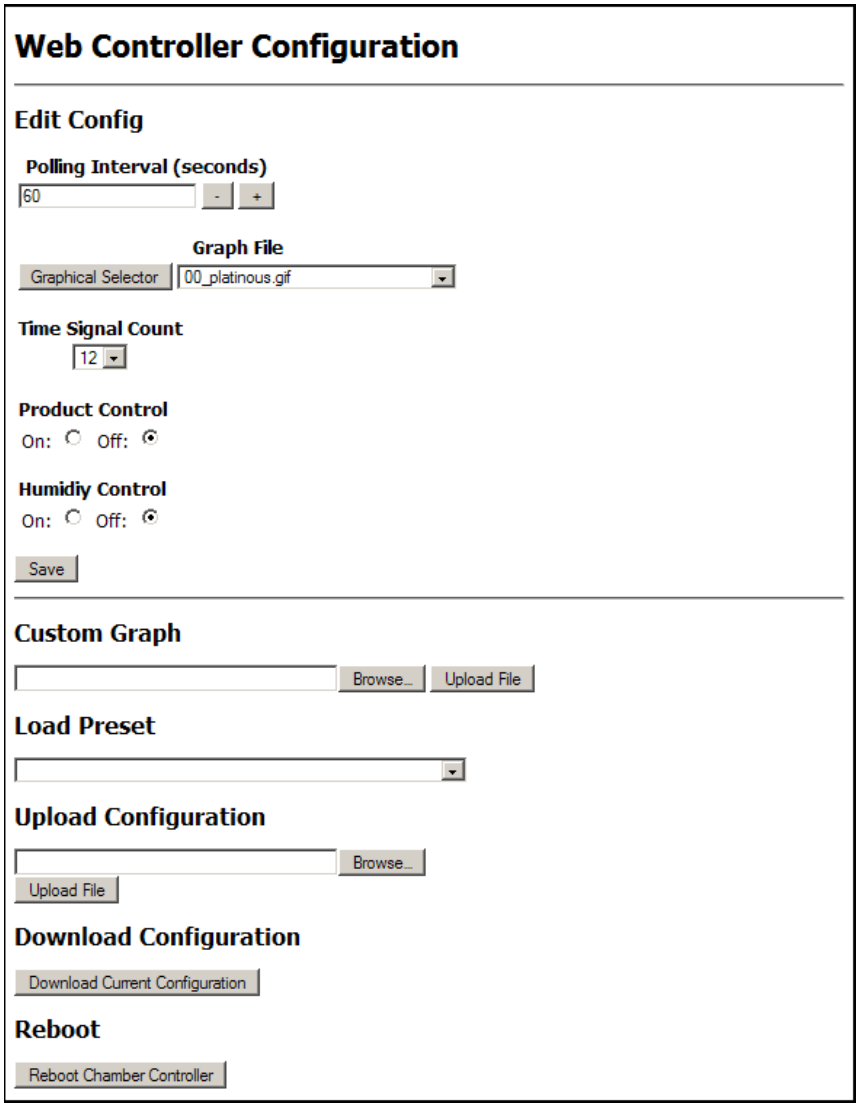


10. Click on the link to navigate to the setup page, and then click on the "Configure Web Controller" button. Enter "4141" as the configuration password and click OK.
11. Configure the web server using the instructions detailed in Section 2.1 "Web Controller Configuration".
12. Start the chamber operation using the P-300 HMI and verify that the chamber operational status updates on the web server to properly reflect the SP & PV data as shown on the chamber monitor HMI screen.
13. Navigate to the Constant Mode Setup screen and verify that you can successfully send a new setpoint to the P-300, without getting any error messages.
14. The web server is now validated as being fully functional.

2.1 Web Controller Configuration

2.1.1 Introduction

The web controller configuration screen is split into two main sections, as shown below. The top section of the screen is used for manually entering the individual configurations, while the bottom section of the screen can be used for loading standard preset configurations and other various functions. You have the option of manually selecting the individual configurations that you need, or you can select a standard preset; which will automatically load standard parameters that are used by many ENA standard test chamber models. In order to use a preset, skip the instructions in section 2.1.1, and go directly to the Load Preset Instructions in the “Web Controller Configuration Procedure” on page 11.



The first step in the web controller configurations process is to find out the details for all of the various configurations and record them for use during the config procedure. Fill in the following data chart for the configurations of your test chamber and controller.

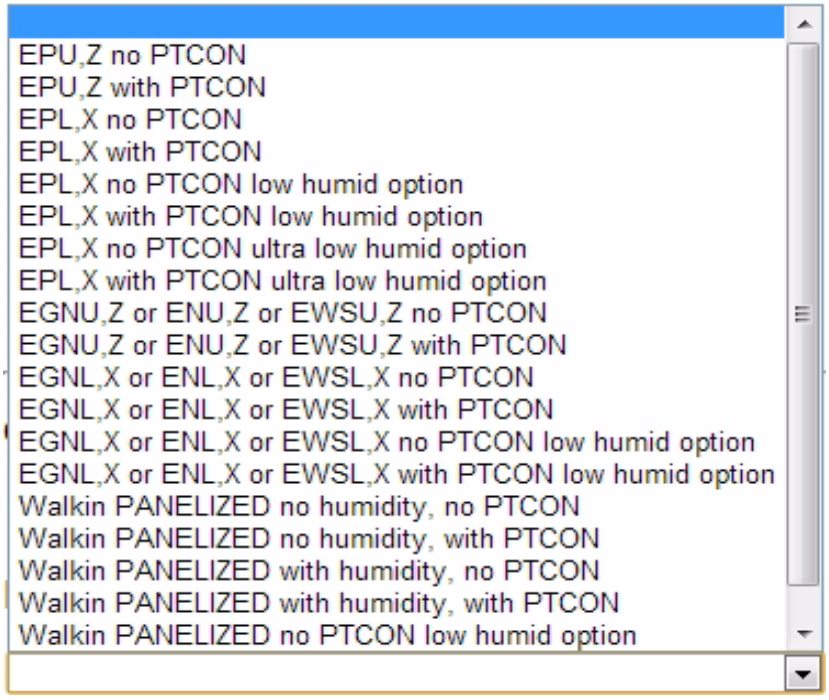
Item Number	Configuration Parameter	P-300 Screen to use for Verification	Actual Data
1	Test chamber has humidity (yes or no)	Constant setup screen	
2	If the chamber has humidity, does it have “low humidity” or “ultra low humidity” options	This data is not on the P-300 screens, verify actual with chamber specification or drawings	
3	Test chamber has product temperature option (yes or no)	Constant setup screen	
4	Chamber type or model (EP, EGN, EN, EWS, EWP) See list below for details	This data is not on the P-300 screens, verify actual with chamber specification or drawings	

Chamber Model Details

Model Name	Model “code” (used by web server config screen)
Platinous H	EP
Platinum	EN
Global N-series	EGN
Solid Walkin	EWS
Panelized Walkin	EWP

2.1.2 Web Controller Configuration Procedure

1. Navigate to the web controller setup page, and click on the “Configure web controller” button. When the dialog box asks for the configuration password, enter “4141” and click the OK button.
2. The initial preference for configuration is to use a configuration “preset”. You need to know the model type of your chamber (EP, EGN, EN, etc.). Click on the “Load Preset” dropdown (shown below) and locate your chamber in the list. Make sure to select the correct line item, based on whether or not your chamber has product temperature control and if it has low humidity or ultra low humidity options.



3. If your exact chamber is in the list, continue to step #4. If your chamber is not on the preset list, skip to step #5 so that you can load the configurations manually in the “Edit config” area of the web page.
4. Click on the appropriate preset and wait for the web server to load the data. A message box that says “Loaded preset to configuration file” will appear when the configuration data has been loaded. Click the OK button to dismiss the box. Now, go to step #10 to complete the configuration process.
5. Using the “Polling interval” numeric data box, select the polling interval you wish to use for data collection with the web server. Manually type the data collection interval in the edit box, or use the plus and minus buttons to change the value one second at a time. This interval time is directly related to the amount of data that the web server can store, as detailed below.

   10 second interval - 3 days of data storage

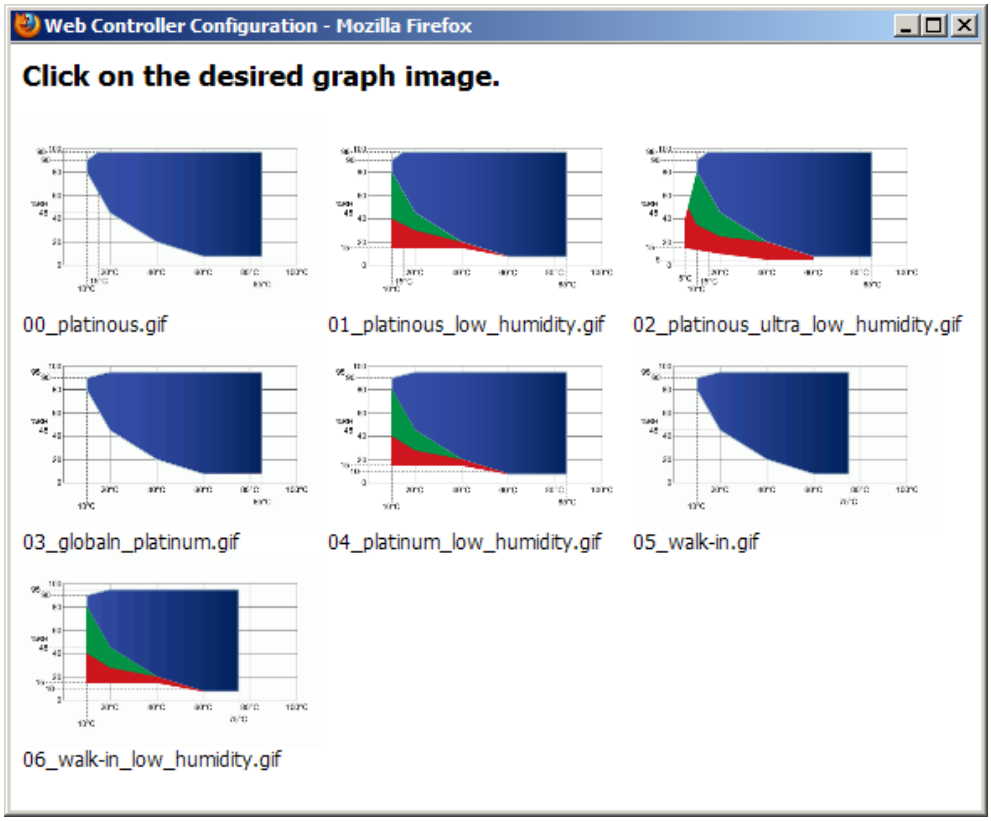
   30 second interval - 9 days of data storage

   60 second interval - 18 days of data storage

   120 second interval - 36 days of data storage

6. Click the appropriate “on” or “off” radio button for “Product control”. This value corresponds to item #4 from the data chart that you filled in at the start of this process.
7. Click the appropriate “on” or “off” radio button for “Humidity control”. This value corresponds to item #2 from the data chart that you filled in at the start of this process.

8. If your chamber does not have humidity, skip this step and go directly to step #10. If your chamber does have humidity, you will need to select the appropriate temp-humidity graph file in the “Graph file” area, which is found directly below the “Polling Interval” edit box. Click on the “Graphical selector” button to bring up the graphical selection window shown below.



Click on the humidity graphic you want to use. The graphical selection window will automatically close, and the graphic file you have chosen will be listed in the “Graph File” drop down box to the right of the “Graphical Selector” button. Alternatively, you can select the graphic image file name directly by using the graph file drop down box; if you can identify the graph file by name alone.

9. After verifying that all of the configurations are correct, click the “Save” button to send them to the web controller. After a few moments, a message box will appear to confirm that the new configurations have been saved to the web controller.
10. Click the “Reboot chamber controller” button at the bottom of the page to complete the process. After waiting for a few minutes, the web controller should be booted back up with the new configuration; and you can validate the changes you made by viewing the other standard web controller screen pages.

2.2 Additional Web Controller Configuration Functions

2.2.1 Custom Temp-Humidity Performance Graphic Files

Custom Graph

1. Click on the “Browse” button in order to use a “non-standard” temperature humidity performance graph for the image that is used on the “Constant Mode Setup” screen.
2. Navigate to the appropriate graphic file, and then click the open box. Click the “Upload File” button to upload the image to the web server you are connected to. The file will upload and a confirmation dialog box will appear to confirm completion of the upload.
3. Click the “OK” button. After the confirmation dialog box disappears, you will see that “999_custom.gif” is selected as the new “Graph file” in the manual edit config settings area in the top section of the screen.
4. Click the “Save” button, and then the “Reboot chamber controller” button to complete your new graphic installation process.

2.2.2 Uploading and Downloading Configuration Parameter Files

Download Configuration

1. Click on the “Download current configuration” button to download the configuration parameters from the web controller you are connected to and storing the file on a server or other hard drive.

This feature can be useful if you have a number of chambers that all need a custom configuration. You can create the configuration for one of the web controllers, download the file, and then upload it to all of the other web controllers that require the same custom configuration. This feature can also be useful for historical archiving purposes.

Upload Configuration

1. Click on the “Browse” button in order to select a web controller configuration parameters file for upload to the currently connected web controller.
2. Navigate to the appropriate configuration file, and then click the open box. Click the “Upload File” button to upload the configuration to the web server you are connected to. The file will upload and a confirmation dialog box will appear to confirm completion of the upload.
3. Click the “OK” button. After the confirmation dialog box disappears, you will see the individual controls in the upper “Edit Config” section of the screen update with the new parameters.
4. Click the “Save” button, and then the “Reboot chamber controller” button (at the bottom of the page) to complete the process.

2.3 Web Controller Configurations Map

Config File Name	Polling Interval*	Humidity Graphic Name	Time Signal Count	Humidity	Product Temp Control
EPU, Z no PTCON* **	60s	n/a (no humidity)	12		
EPU,Z with PTCON	60s	n/a (no humidity)	12		X
EPL,X no PTCON	60s	platinous.gif	12	X	
EPL,X with PTCON	60s	platinous.gif	12	X	X
EPL,X no PTCON low humid option	60s	platinous_low_humidity.gif	12	X	
EPL,X with PTCON low humid option	60s	platinous_low_humidity.gif	12	X	X
EPL,X no PTCON ultra low humid option	60s	platinous_ultra_low_humidity.gif	12	X	
EPL,X with PTCON ultra low humid option	60s	platinous_ultra_low_humidity.gif	12	X	X
EGNU,Z or ENU,Z or EWSU,Z no PTCON	60s	n/a (no humidity)	12		
EGNU,Z or ENU,Z or EWSU,Z with PTCON	60s	n/a (no humidity)	12		X
EGNL,X or ENL,X or EWSL, X no PTCON	60s	globaln_platinum.gif	12	X	
EGNL,X or ENL,X or EWSL, X with PTCON	60s	globaln_platinum.gif	12	X	X
EGNL,X or ENL,X or EWSL,X no PTCON low humid option	60s	platinum_low_humidity.gif	12	X	
EGNL,X or ENL,X or EWSL,X with PTCON low humid option	60s	platinum_low_humidity.	12	X	X
Walkin PANELIZED no humidity, no PTCON	60s	n/a (no humidity)	12		
Walkin PANELIZED no humidity, with PTCON	60s	n/a (no humidity)	12		X
Walkin PANELIZED with humidity, no PTCON	60s	walk-in.gif	12	X	
Walkin PANELIZED with humidity, with PTCON	60s	walk-in.gif	12	X	X
Walkin PANELIZED no PTCON low humid option	60s	walk-in_low_humidity.gif	12	X	
Walkin PANELIZED with PTCON low humid option	60s	walk-in_low_humidity.gif	12	X	X

*Note: Standard polling interval of 60s will give 18 days of storage.
***Standard web server firmware ships with "**EPU,Z no PTCON**" configuration file.

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