



**WEB CONTROLLER
FOR SOFTWARE VERSION 2.1
USER MANUAL**



- 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.

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1.0 Introduction

This document describes the various features of Espec North America's web controller version 2.

1.1 User Accounts

The web controller supports various user access types. These types and the pages they may access are listed in the following table. The 'Guest' account type is used when the user is not logged into the web controller.

User Account Access Table.						
Account Type	Pages					
	Home	Monitor	Constant Setup	Program Setup	Run/Stop	Setup
Guest	Yes	Yes	No	No	No	No
User	Yes	Yes	Yes	No	Yes	No
Technician	Yes	Yes	Yes	Yes	Yes	No
Administrator	Yes	Yes	Yes	Yes	Yes	Yes

The Server comes configured with an Administrator account: username: 'admin', password: 'admin'.

1.2 Requirements

Browser Compatibility:

- Internet Explorer: version 9+
- Google Chrome
- Mozilla Firefox
- Apple's Safari
- Opera

Site requirements:

- IPv6 is not supported at this time.
- DHCP is used by default; if no DHCP server is reachable a static IP address of 192.168.0.83 will be used. A static IP address may also be used if DHCP is not desirable, this is configured on the setup screen.

1.3 Terminology

Since this web controller is intended for use with several different process controllers this section covers the various terminology used on the web controller and the corresponding terminology of the supported controller(s).

Web Controller	P300 SCP-220	Watlow F4T	Description
Program	Program	Profile	A series of set points for the chamber to run.
Time Signal	Time Signal	Profile Event	A signal that can be used to turn features on or off manually or at a programmed time.
		Event Output	

2.0 Accessing the Web Controller

There are two ways to access the web controller.

1. Directly via the IP address <http://ipaddress/>, the IP address can be found two different ways:
 - a. Each time the web controller boots up it will post the IP address to the chamber controller:
 - i. On a Watlow F4T the IP address is shown on the 3rd line of the message screen:



- ii. On a P300 the IP address is shown (and settable) on the “Set Lan” Screen:



- b. The IP address can be found via the “Espec Web Controller Locator” utility included on the web controller and or chambers manual CD. The utility will scan look for web controllers version 2.0.0 and higher immediately after opening it, the IP Addresses are listed in the second column. Clicking on the IP address will open that controller via its IP address, the host name will be clickable if the computer can resolve it.



2. Additionally the web controller can be accessed via its hostname: <http://HOSTNAME/> on windows, <http://HOSTNAME.local> on Apple devices, windows computers with Apple's Bonjour, and Linux Computers. There are several ways to access the hostname:

- a. The default hostname that the chamber ships with is "espec-serial#" where "serial#" is the serial number of the chamber. If the web controller did not ship with the chamber then the hostname is "espec-default".



For the serial tag shown to the left the web controller would be accessible at: <http://espec-06ic515/> on windows and <http://espec-06ic515.local> on apple devices or Linux computers.

- b. The hostname can also be found on a chamber with a Watlow F4T in the same manner the IP address except the hostname is on line two not three (see 1.a.i of this section).
- c. The hostname can also be found using the "Espec Web Controller Locator" just like the IP address (see 1.b. of this section); the hostnames are listed in the first column.

3.0 First Time Use

Connecting to the device and configuring it for use on your network. The web controller is setup initially to use DHCP, however it will default to an IP address of 192.168.0.83 if a DHCP server is not found.

1. Ensure that the web controller is not powered up.
 - a. When the web controller is installed inside a chambers electrical box, turn power off by the disconnecting means (unplug it or switch of the chambers main breaker).
 - b. If the web controller is the external type then simply disconnect the power cord.
2. Connect the web controller to the network via a straight through Ethernet cable, or directly to a computer via a cross over Ethernet cable. Ensure that the correct Ethernet port is used:



3. Apply power to the web controller and chamber (if the web controller is installed into the chamber turning on the chamber's disconnect or plugging the power cord back in is sufficient).
4. Give the web controller (and chamber if applicable) time to boot up, two minutes should be sufficient.
5. Access the web controller's home page, which will redirect to the initial setup wizard when accessed the first time.
 - a. Refer to section 2.0 of this manual for further details when connected to a network.
 - b. If connected directly via a cross over cable the web controller interface is available at (no quotes): "http://192.168.0.83/".
6. The web controller will prompt for a username and password in order to run the setup wizard; use the following (no quotes):
Username: "admin"
Password: "admin"
7. Follow the directions given by the web controller.
 - a. If the web controller was installed into the chamber at the factory the setup wizard will skip the first step for the controller.
 - b. It is highly recommended that the "admin" accounts password is changed when prompted.
 - c. The wizard can be exited at any time by pressing the "Exit Wizard" button located at the bottom of all pages. This is not recommended as all settings will need to be configured manually and a manual reboot may be required.
8. Once the setup is complete, and the web controller has finished rebooting the web controller is ready for use. If the IP address or hostname was changed during setup it may be required to navigate to the new hostname or IP address after the reboot.

4.0 Common Page Elements

A Description of elements common to all pages for both desktop (left) and mobile (right) view.

The image displays two side-by-side screenshots of the ESPEC Web Controller interface. The left screenshot shows the desktop view, and the right screenshot shows the mobile view. Both views are annotated with numbered callouts (1-5) pointing to common page elements.

Desktop View (Left):

- 1:** Navigation bar containing links: Monitor, Constant Setup, Program Setup, Run/Stop, Setup.
- 2:** Location bar showing the current web controller name (WebDevF4T) and the current page (Setup).
- 3:** Page contents area with four main sections: Monitor, Run/Stop Operation, Program Setup, and Constant Setup.
- 4:** Status bar at the bottom showing: Status: Standby, Program: None, Program Step: None, Temperature: Off, Process Value: 29.8°C, Time Signals: Time Signal (On), Alarm Status: None, Chamber Date/Time: Wed Nov 30 2016 16:06:31.

Mobile View (Right):

- 1:** Navigation bar collapsed into a hamburger menu icon.
- 2:** Location bar showing the current web controller name (WebDevF4T) and the current page (Standby) with a temperature of 29.8°C.
- 3:** Page contents area with two main sections: Monitor and Run/Stop Operation.
- 4:** Status bar at the bottom showing: Status: Standby, Program: None, Program Step: None, Temperature: Off, Process Value: 29.8°C, Time Signals: Time Signal (On), Alarm Status: None, Chamber Date/Time: Wed Nov 30 2016 16:34:28.

1. Navigation bar; contains links to each page on the web controller. On a mobile device it will collapse into an expandable menu.
2. Location bar; this shows the current web controller name as well as what page is being viewed.
3. Page contents; this is where each page will differ, the one shown here is "Home Page". Note in order to fit the mobile screen shot on one page some of the pages contents have been removed.
4. Status bar; this allows a quick at-a-glance view of what the chamber is currently doing.
5. Quick status; since the mobile view pushes the status bar to the bottom of the screen the most relevant information is shown in the navigation bar for mobile devices only. The first line gives the chambers current run status (i.e. Standby, Constant, Program, Alarm) and the second line the conditions inside the chamber i.e. temperature and humidity (if the chamber has humidity).

5.0 Status Bar

The status bar gives the chamber status at a glance. A brief description of each section of the side bar is shown here:

The status bar is divided into several sections:

- Status:** Standby
Program: None
Program Step: None
- Set Point / Process Value:** Temperature Off **29.7°C**
- Time Signals:** Time Signal On
- Alarm Status:** None
- Chamber Date/Time:** Wed Nov 30 2016 16:58:58

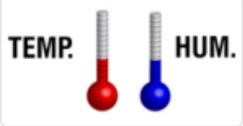
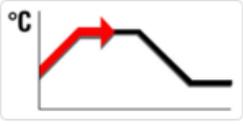
Callout boxes provide the following descriptions:

- Status:** This is the current run mode of the chamber; see the "Status Modes" table below for further details.
- Set Point / Process Value:** The current conditions in the chamber. If the conditions are currently being controlled the set point will be shown as well.
- Time Signals:** This shows the current time signal status.
- Alarm Status:** All active chamber alarms that may prevent the chamber from running will be listed here.
- Chamber Date/Time:** The current date and time of the controller.

Status Modes	
Status	Description
Status: Standby Program: NONE Program Step: NONE	The chamber is currently not running.
Status: Constant Program: NONE Program Step: NONE	The chamber is currently running a constant set point.
Status: Program Running Program: Humidity Program Step: 1	The chamber is currently running a program. The current program is shown, clicking on it will open it in for editing. The current program step is shown.
Status: Alarm Program: NONE Program Step: NONE	The chamber is currently alarmed, this state must be cleared before operation may resume.

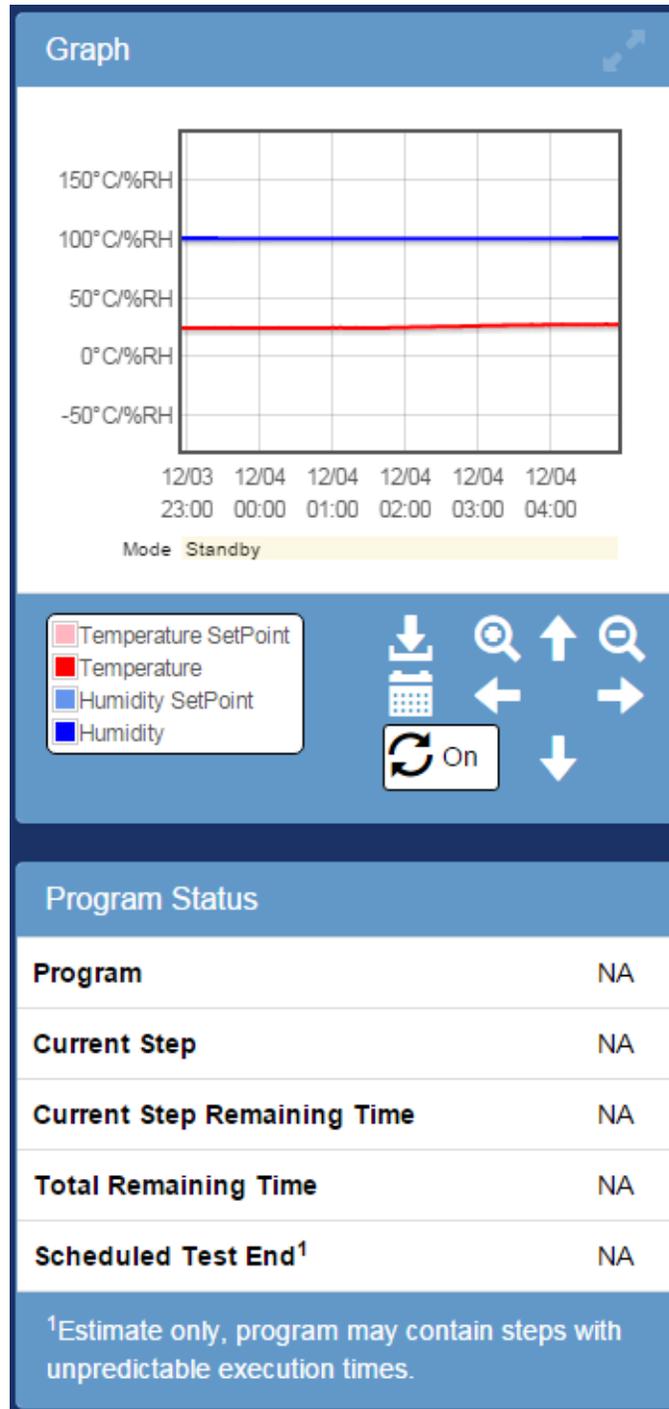
6.0 Home Page

This page provides shortcuts to all other pages that contain the actual functionality. Any user type, as well as guests may access this page.

<h3>Monitor</h3>  <p>Check and monitor current chamber operation.</p>	<h3>Run/Stop Operation</h3>  <p>This is where the chamber is turned on, off and programs run.</p>
<h3>Program Setup</h3>  <p>Create or edit a program for the chamber.</p>	<h3>Constant Setup</h3>  <p>Set the chamber to run a single condition.</p>
<h3>System Setup</h3>  <p>Set software and chamber configuration.</p>	

7.0 Monitor Page

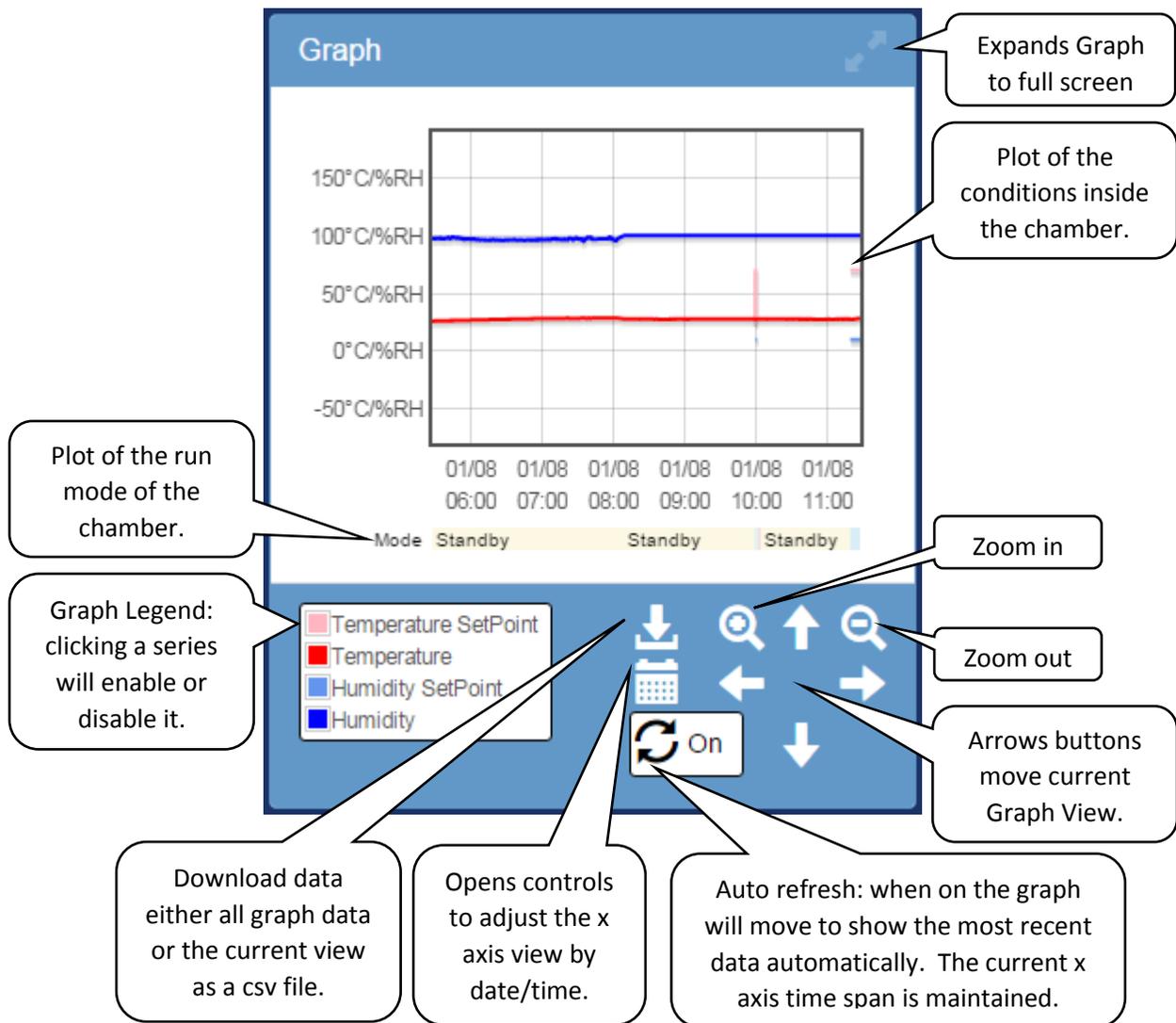
The Monitor page contains two sections of information about the chamber. The top section is a trend graph of the conditions inside chamber and its control mode. The bottom section details the currently running program when the chamber is program mode. Any user type may access this page.



7.1 Graph

The trend graph has two sets of controls; buttons shown on in the graph panel shown below, and controls that can be accessed when using a mouse:

- Left clicking will select the nearest point in time as well as show the value of each series at that time.
- Left clicking and dragging will zoom into the selected area.
- Clicking and dragging the mouse wheel will pan around the view around and load in data as required.
- Scrolling the mouse wheel up/down will zoom in/out centered at the cursor.



7.2 Program Status

The program status contains the details about the current program when the chamber is in program mode.

Program Status	
Program	Humidity
Current Step	1
Current Step Remaining Time	1:00:00
Total Remaining Time	10:00:00
Scheduled Test End¹	Fri Jan 08 2016 22:44:37

¹Estimate only, program may contain steps with unpredictable execution times.

The running programs name, clicking it will open it in the program editor.

The current step number of the running program.

The time remaining on the current step (format: HH:MM:SS).

The time remaining on the running program (format: HH:MM:SS).

The estimated program end time.

8.0 Constant Setup Page

This page allows setting of the constant set point and time signals, and refrigeration power (SCP-220/P300 only) for constant mode operation. To change the constant set point; enter the temperature, humidity (if equipped), product control settings (if equipped) and time signal settings then press “Apply”. Further details on each element and its functionality is shown below. Only users of type ‘User’, ‘Technician’, or ‘Administrator’ may access this page.

	Mode	Setpoint		Product Control		
				Enable	+ Deviation	- Deviation
Temperature	On ▼	60	°C	<input type="checkbox"/>	10 °C	-10 °C
Humidity	Off ▼	70	%RH			

Other	
Refrigeration	Auto ▼

Time Signals

Time Signal #1

Time Signal #2

Other

Refrigeration: Auto ▼

Apply

Humidity Range Chart

Legend: ■ Standard Humidity, ■ Set Point

On the Watlow F4T changing the time signals will effect a running program.

Send settings to the chamber controller.

Humidity Range Chart will only be visible on a chamber with humidity.

Constant point, only visible if Temperature is 0-100°C (32-212°F).

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9.0 Program Setup Page

This page displays all programs currently on the chamber as well as all available slots shown as "EMPTY" (each chamber has 40 program slots). Each slot lists the program name which can be clicked to edit it; as well as controls to download, upload, or delete the program. Only users of type 'Technician', or 'Administrator' may access this page.

#	Name	Actions
1	Humidity	  
2	BTX-475	  
3	EMPTY	  
4	EMPTY	  

Program slot number.

The program name "EMPTY" denotes no program in this slot.

Download this program.

Upload to this program.

Delete this program.

10.0 Program Edit Page Watlow F4T

This page is where Watlow F4T programs can be viewed and edited. This page is only accessible if the web controller is configured for a Watlow F4T and for users of type 'Technician', or 'Administrator' may access this page.

The screenshot shows the 'Program Edit Page' for a Watlow F4T. The page is divided into three main sections: 'Program Details', 'Program Steps', and 'Program Preview'. Callout 10.1 points to the 'Program Details' section, which includes a 'Program Name' field, a 'Log Data' button, and a 'Guaranteed Soak Deviation' section with 'Temperature(°C)' and 'Humidity(%RH)' fields, both set to 3. Callout 10.2 points to the 'Program Steps' section, which is a table with columns for Step, Step Mode (Jump, Soak, Ramp), Step Duration (HHH:MM:SS), Temperature (EN, Set Point, GS), Humidity (EN, Set Point, GS), and Time Signals. Two steps are listed: Step 1 with a duration of 2:00:00 and a temperature set point of 50, and Step 2 with a duration of 0:00:00 and a humidity set point of 10. Callout 10.3 points to the 'Program Preview' section, which is a line graph showing Temperature (red line) and Humidity (blue line) over time. The x-axis is labeled 'Instant' and has markers at 1.00, 2.00, and 3.00. The y-axis ranges from 0 to 70. The graph shows a temperature jump from 0 to 50 at 1.00, a humidity jump from 0 to 60 at 1.00, a temperature jump from 50 to 0 at 2.00, and a humidity jump from 60 to 0 at 2.00. The 'Append Step' button is located below the table, and 'Download', 'Save To', and 'Save #8' buttons are at the bottom right.

10.1

10.2

10.3

This is a drop down for navigating to other program slots.

To Edit the current program:

1. Enter the program name, guaranteed soak deviation, and data logging settings per section 10.1.
2. Fill in the each program step.
 - a. Select a step mode (if an instant set point change is not desired).
 - b. Enter step duration (not applicable for Jump, Ramp:Rate, or End mode steps).
 - c. Enter the loop details, enabled guaranteed soak, set point, etc.
 - d. Enter the time signal settings.
3. Repeat 2 for each step
4. Once the program is complete there are several options:
 - a. Download: Download the program to the computer as a JSON file.
 - b. Save To: Save the program to a slot any of the slots the chamber has.
 - c. Save #(slot): Save the program to the active slot.

10.1 Program Details

Overall settings for the entire program are set in the first section; element details are shown below.

The screenshot shows the 'Program Details' section of a software interface. It includes a 'Program Name' field with the value 'Manual Profile', a 'Log Data' checkbox, and a 'Guaranteed Soak Deviation' section with 'Temperature(°C)' and 'Humidity(%RH)' both set to 3. Three callout boxes provide additional information:

- Program Name:** 1-20 characters.
- Log Data:** Logs data while the program is running if the Watlow F4T has the logging option.
- Guaranteed Soak Deviation:** When a step has Guaranteed Soak the step counter will not run unless the process value is within \pm the deviations.

10.2 Program Steps

The program steps are edited in the second section; element details are shown below.

The screenshot shows the 'Program Steps' section with a table of step parameters. Below the table are buttons for 'Append Step', 'Download', 'Save To', and 'Save #10'. Five callout boxes explain these elements:

- Program Step:** Points to the first row of the table.
- Add a new step to the end:** Points to the 'Append Step' button.
- Download this program:** Points to the 'Download' button.
- Save to another slot (dropdown):** Points to the 'Save To' dropdown menu.
- Save to this slot:** Points to the 'Save #10' button.

Column Description:

- Step:** The rows step number in addition to buttons that will insert a step before the selected step (+), or delete the selected step (-). On the last step only the option to set the end conditions is available, selecting this will replace the standard parameters with the option to stop the chamber when the program ends as well as set each loops (Temperature/Humidity) mode when the program ends:

This detailed view shows the 'End' condition settings for a step. It includes a 'Stop Chamber' checkbox, two 'Mode' dropdown menus (both set to 'User'), and a 'Show' button.

- Step Mode:**

- **Jump:** Instead of changing the set point the program will jump to a specified step a specified number of times; selecting this will change the view as shown:

<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	Target Step	1	Repeat Count	0	Show
-------------------------------------	---	-------------------------------------	-------------	---	--------------	---	------

- **Soak:** Instead of changing the set point the program will maintain the previous set point for a specified “Step Duration”; selecting this will change the view as shown:

Step	Step Mode			Step Duration (HHH:MM:SS)	Temperature		Humidity		Time Signals		
	Jump	Soak	Ramp		EN	Set Point	GS	EN		Set Point	GS
<input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1:00:00	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Show

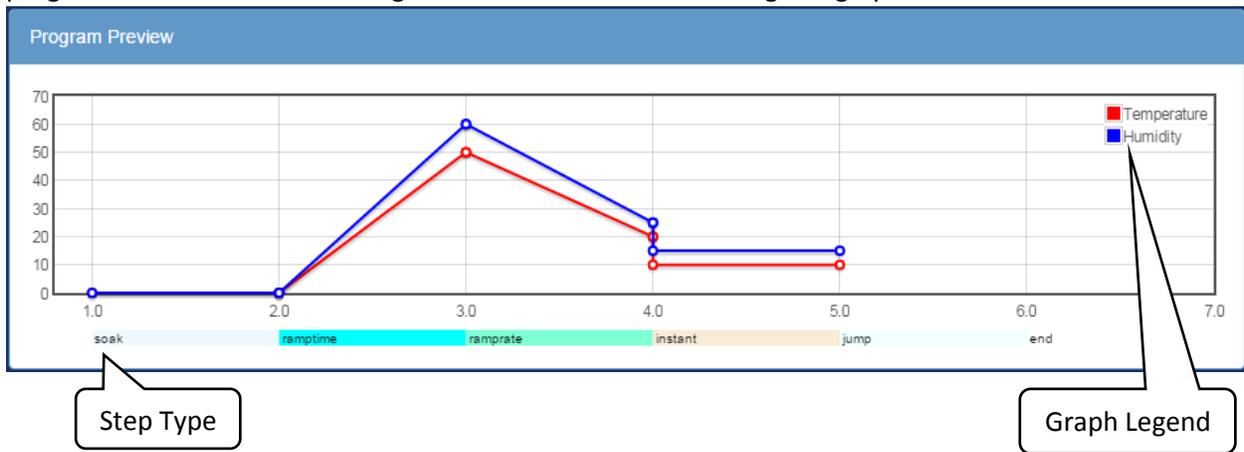
- **Ramp:**
 - Off: The set point will be changed instantly.
 - Time: The set point will be ramped to the new set point over the given duration.
 - Rate: The set point will be ramped at a given rate; selecting this will change the view as shown:

Step	Step Mode			Step Duration (HHH:MM:SS)	Temperature		Humidity		Time Signals		
	Jump	Soak	Ramp		EN	Set Point	GS	EN		Set Point	GS
<input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Rate		<input checked="" type="checkbox"/>	60	<input type="checkbox"/>	<input checked="" type="checkbox"/>	50	<input type="checkbox"/>	Show
					Rate	5		Rate	5		

- **Step Duration:** The duration of the step in Hours: Minutes: seconds. If an entered time has greater than 60 seconds or minutes the time will be converted to the correct format ie: “90” becomes “0:01:30”, and “90:00” becomes “1:30:00” etc.
- **Temperature, Humidity (or any control loop):** This is a control loop, the following parameters can be set:
 - **EN:** Enable the loop for this step.
 - **Set Point:** The temperature/humidity to go to during this step.
 - **GS:** Enable Guaranteed soak for this step; this prevents the duration timer from counting down until the process value is within +/- the deviation set in the program details section.
 - **Rate:** This parameter is only visible if the step is set to have a Ramp:Rate; it specifies the rate at which the working set point will change in order to achieve the specified set point.
 - **Mode:** This parameter is only visible if the final steps end checkbox is selected; it specifies what each loop (Temperature, Humidity) will do when a program ends.
 - User: Run the constant set point.
 - Hold: Hold the last set point that the program was at.
 - Off: Disable the loop. This should not be used as the loop will need to be manually re-enabled.
- **Time Signals:** This button will show the settings for each available time signal.
 - NC: No change; do not change the state of this time signal.
 - On: Turn the time signal on.
 - Off: Turn the time signal off.

10.3 Program Preview

The current program is plotted at the bottom of the page. Note that the conditions prior to starting a program are assumed to be 0 degrees and 0%RH when rendering this graph.



11.0 Program Edit Page P300/SCP-220

This page is where P300/SCP-220 programs can be viewed and edited. This page is only accessible if the web controller is configured for a P300/SCP-220 and for users of type 'Technician', or 'Administrator' may access this page.

The screenshot shows the 'Program Editor #1' interface. At the top, there is a breadcrumb 'WebDevP300 > Program Editor #1'. Below this is the 'Program Details' section, which includes a 'Program Name' field with 'TEST', an 'End Mode' dropdown set to 'Off', and a 'Next Program' dropdown set to '1:TEST'. Below these are three expandable sections: 'Temperature Details', 'Humidity Details', and 'Counter Details'. Callout 11.1 points to the 'Next Program' dropdown. A callout box on the right explains: 'This is a drop down for navigating to other program slots.'

The 'Program Steps' section contains a table with columns for Step, Duration, Soak Ctrl, Temperature (Set Point, Ramp, EN, + Dev, - Dev), Humidity (EN, Set Point, Ramp), Refrig., Time Signals, and Counter (A, B). The first step is numbered '1' and has a duration of '1:00'. Below the table is an 'Append Step' button. Callout 11.2 points to the table. At the bottom of this section are 'Download', 'Save To', and 'Save #1' buttons.

The 'Program Preview' section shows a line graph with a y-axis from -1.0 to 1.0 and an x-axis from 1 to 2. A red line represents 'Temperature' and a blue line represents 'Humidity'. Both lines are flat at 0.0. Callout 11.3 points to the graph.

To Edit the current program:

1. Enter the program name, guaranteed soak deviation, and data logging settings per section 10.1.
2. Fill in the each program step.
 - a. Select a step mode (if an instant set point change is not desired).
 - b. Enter step duration (not applicable for Jump, Ramp:Rate, or End mode steps).
 - c. Enter the loop details, enabled guaranteed soak, set point, etc.
 - d. Enter the time signal settings.
3. Repeat 2 for each step
4. Once the program is complete there are several options:
 - a. Download: Download the program to the computer as a JSON file.
 - b. Save To: Save the program to a slot any of the slots the chamber has.
 - c. Save #(slot): Save the program to the active slot.

11.1 Program Details

This section allows the user to setup a program name, as well as specify what the chamber will do when the program has finished execution. The following execution modes are available:

- **Off:** Turn the chamber off.
- **Start constant mode:** Run the first constant mode.
- **Hold last step:** Hold the set point(s), time signal(s) and refrigeration settings from the last step executed.
- **Start Next Program:** Start the next program that is specified by the Next program drop down menu.
- **Standby (P300 only):** Stop operation but leave the chamber display on.

Program Details

Program Name	End Mode	Next Program
<input type="text" value="TEST"/>	<input type="text" value="Off"/>	<input type="text" value="1:TEST"/>

Temperature Details

Humidity Details

Counter Details

11.1.1 Temperature/Humidity Details

Only present on P300 controllers. This section provides settings for the allowable range of operation of this program as well as how the controller will behave when the first program step contains a ramp.

Temperature Details

Abs. High (°C)	Abs. Low (°C)	Ramp Start Mode	Ramp Start Setpoint (°C)
<input type="text" value="190"/>	<input type="text" value="-80"/>	<input type="text" value="Off"/>	<input type="text" value="0"/>

Notes:

- **Abs. High:** The high limit of the chamber while this program is running.
- **Abs. Low:** The low limit of the chamber while this program is running.
- **Ramp Start Mode:** If setpoint ramping is enabled for the first step of the program do the selected action
 - **Off:** Do not ramp to the setpoint for step #1.
 - **Set Point:** Ramp starting from the setpoint specified in this details section.
 - **Process Value:** Ramp starting from the process value of the chamber when the program was started.
- **Ramp Start Setpoint:** The setpoint used when "Set Point" is selected for "Ramp Start Mode".

11.1.2 Counter Details

This section sets up the counters A & B which can be used to make a set number of steps repeat a set number of times. To use it enter the start step (bottom left) end step (bottom right) and desired number of cycles (top center). These settings may also be configured in the program steps section as draggable arrows.

Counter Details

Counter A

↙

↖

→

Counter B

↙

↖

→

Notes:

- Each counter may be used to execute a range of steps a set number of times, they may be nested but they may not cross, the counters/section will turn red when invalid settings are entered.
- Field description:
 - Cycles (Top Center):** The number of times to run the steps (note the actual number of times the steps will be executed is this plus one).
 - Start Step (Lower Left):** The first step in the set.
 - End Step (Lower Right):** The last step in the set, go to the start step after this unless the specified number of cycles have been run.

11.2 Program Steps

The program steps are edited in the second section; element details are shown below.

Program Steps

Step	Duration (HH:MM)	Soak Ctrl	Temperature		Product Temp. Ctrl			Humidity			Refrig.	Time Signals	Counter	
			Set Point	Ramp	EN	+ Dev	- Dev	EN	Set Point	Ramp			A	B
⊕ 1 ⊖	1:00	<input type="checkbox"/>	0	<input type="checkbox"/>	<input type="checkbox"/>	0	0	<input type="checkbox"/>	0	0	Auto	All Off	<input checked="" type="checkbox"/>	<input type="checkbox"/>
⊕ 2 ⊖	1:00	<input type="checkbox"/>	10	<input type="checkbox"/>	<input type="checkbox"/>	0	0	<input type="checkbox"/>	0	0	Auto	All Off	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Append Step

Program Step

Add a new step to the

Download this program

Save to another slot (dropdown)

Save to this slot

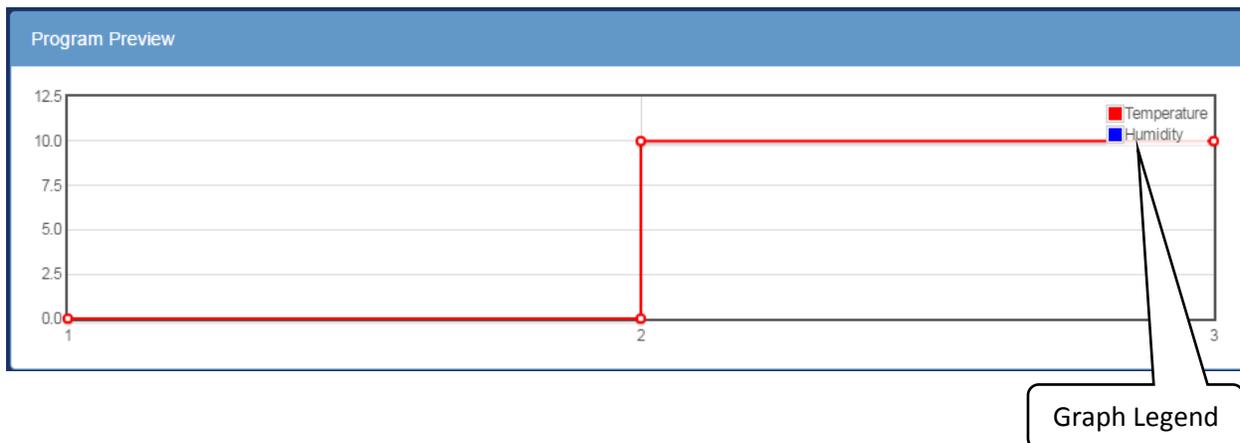
Columns Description:

- Step:** The rows step number in addition to buttons that will insert a step before the selected step (⊕), or delete the selected step (⊖).
- Duration:** The duration of the step in Hours: Minutes. If an entered time has greater than 60 minutes the time will be converted to the correct format ie: "90" becomes "01:30" etc.

- **Soak Ctrl:** When soak control is enabled the step will wait until the setpoint(s) have been attained before the duration counter starts to count down.
- **Temperature:** The temperature control loop settings.
 - **Set Point:** The temperature to go to during this step
 - **Ramp:** When enabled the set point will be gradually changed from the previous steps set point to this steps set point over the duration of the step. When disabled the set point will be set immediately go to this steps set point when the step begins.
- **Product Temp. Ctrl (Optional):** Control the product temperature not the air temperature.
 - **EN:** Enable or disable product temperature control.
 - **+ Dev:** The allowable positive deviation between the product and air temperatures (must be positive).
 - **- Dev:** The allowable negative deviation between the product and air temperatures (must be negative).
- **Humidity (Optional):** The humidity control loop settings.
 - **EN:** Enable or disable humidity control for this program step.
 - **Set Point:** The humidity set point for this step.
 - **Ramp:** When enabled the set point will be gradually changed from the previous steps set point to this steps set point over the duration of the step. When disabled the set point will be set immediately go to this steps set point when the step begins.
- **Refrig:** Configure how the refrigeration system will behave during this step. It can be setup for automatic cooling power, a manual cooling power percentage, or completely disabled.
- **Time Signals:** Turn each time signal on or off for each step.
- **Counter:** The counter is used to repeat a specified number of steps. Both counter A and counter B can be set by enabling the check box in their respective column then dragging the start(◀) and end(▶) arrows to the desired step. The counter (number of times to repeat the steps can be adjusted in the text box in each column.

11.3 Program Preview

The current program is plotted at the bottom of the page. Note that the conditions prior to starting a program are assumed to be 0 degrees and 0%RH when rendering this graph.



12.0 Run/Stop Page

The chamber may be started, stopped, and programs run from this page. Only users of type 'User', 'Technician', or 'Administrator' may access this page.

12.1 Section Description

A description of what each section means, and how to tell if it is active or not is given below.

The screenshot shows a user interface for controlling a chamber. At the top, there is an 'Alarm' section with a red header and a red checkmark icon. Below it, a message states: 'The chamber cannot run any mode until alarms are cleared at the chambers user interface.' Below the alarm section are three mode selection panels: 'Standby', 'Constant', and 'Program'. Each panel has a title, an 'In-Active mode checkbox', and a 'Run' button. The 'Standby' panel has a 'Stop Operation' button. The 'Constant' panel shows 'Temperature 50.0°C' and 'Humidity 45.0%RH'. The 'Program' panel shows 'Program' set to 'BTX-475', 'Step Number' set to '1', and buttons for 'Run Program Mode', 'Pause', 'Continue', and 'Next Step'. Callouts provide descriptions for each mode and checkbox.

Alarm Mode: the chamber has an active alarm. (Only visible when there is an active alarm.)

Active mode checkbox.

Alarm

The chamber cannot run any mode until alarms are cleared at the chambers user interface.

Standby

Stop Operation

In-Active mode checkbox.

Constant

Run Constant Mode

Temperature 50.0°C

Humidity 45.0%RH

Program

Program BTX-475

Step Number 1

Run Program Mode

Pause Continue Next Step

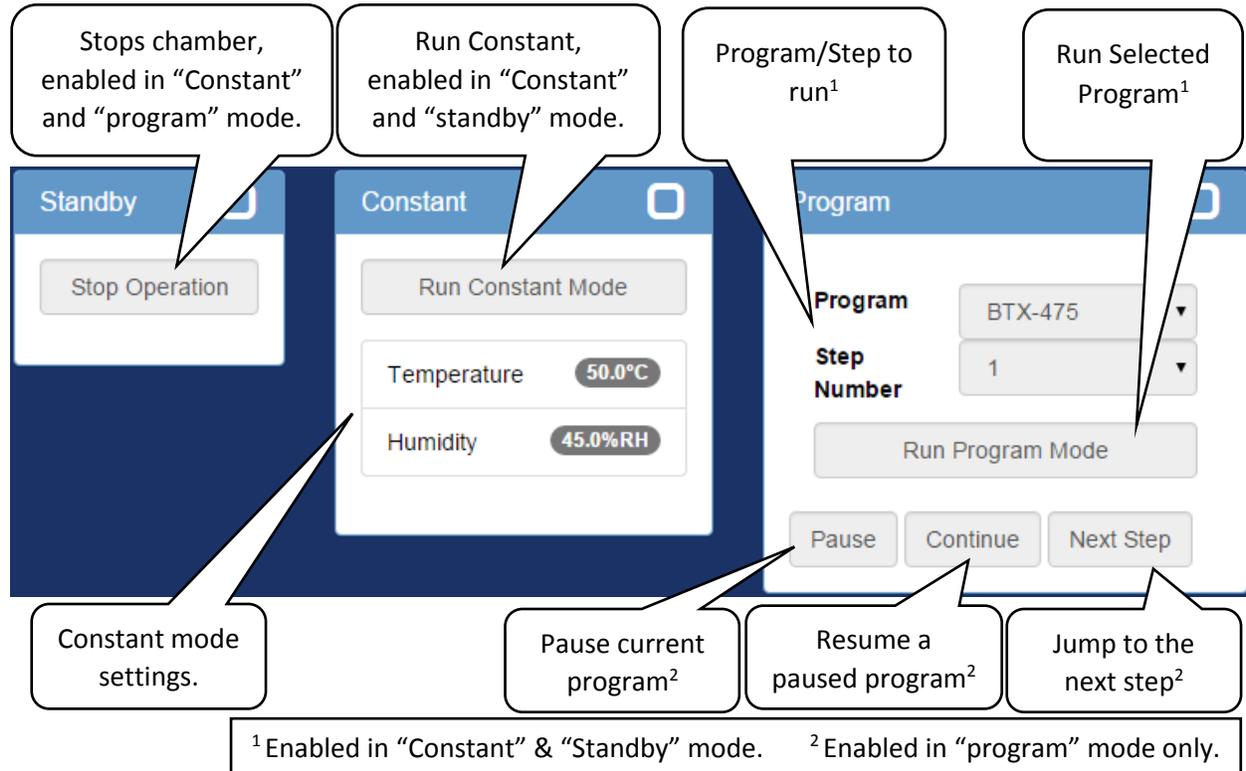
Standby Mode: the chamber is not currently running.

Constant Mode: the chamber is running the constant set point.

Program Mode: the chamber is running the program shown.

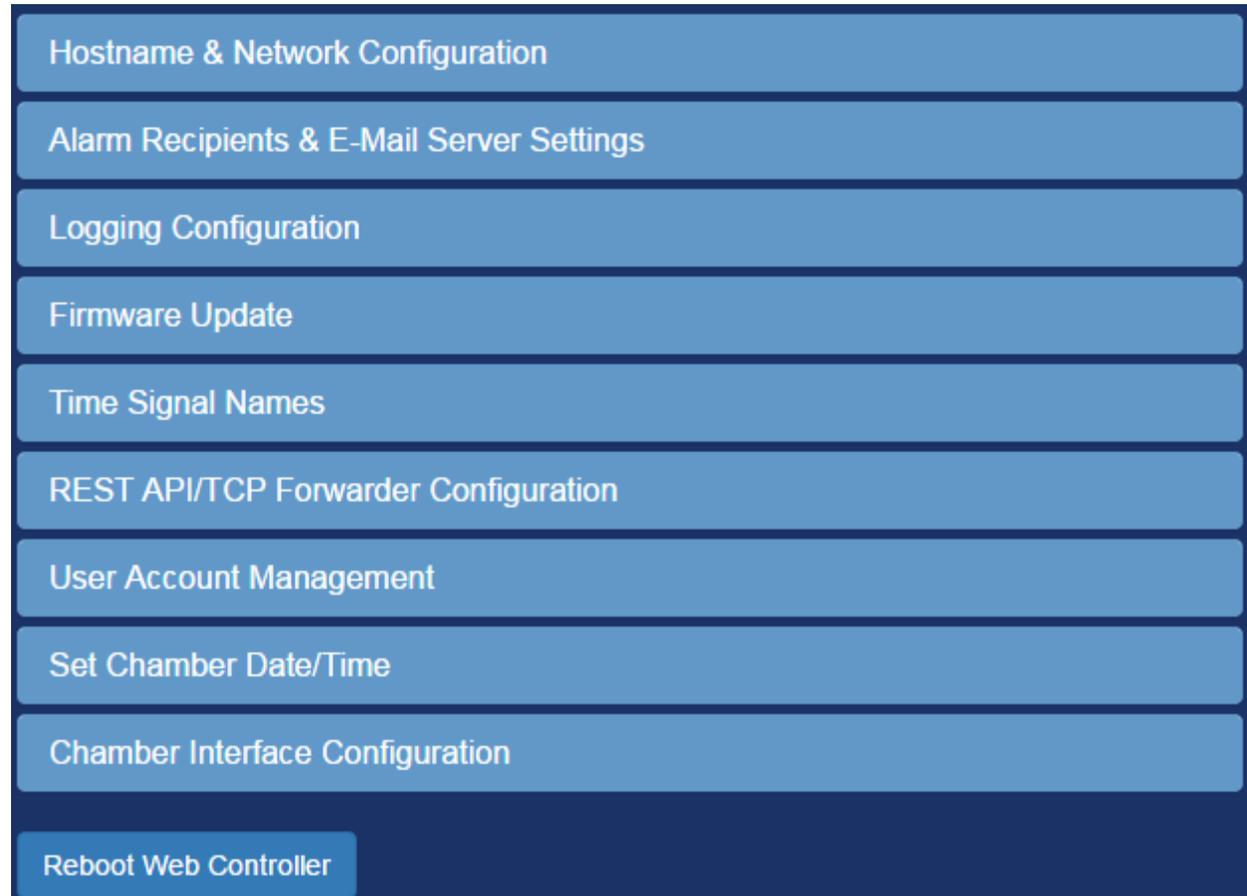
12.2 Mode Controls

An overview of the controls functions and when they are enabled or disabled is given below.



13.0 Setup Page

An administrator account can update various web controller settings on this page. This section is divided into a subsection for each section on the web controller itself.



13.1 Hostname & Network Configuration

View and configure the web controller's network connection and host name.

Hostname & Network Configuration

Hostname

DHCP

IP Address

Netmask

Gateway

DNS 1

DNS 2

Notes:

- All changes excluding the "Hostname" take effect immediately.
- A reboot may be required for the new "Hostname" to resolve.
- **MAC Address:** b8:27:eb:89:4d:67

Hostname: The hostname is used for windows networks when it is 15 characters or less. A windows computer may then access the web controller via `http://"hostname"/`

Linux computers, Apple devices and windows computers with bonjour may access the web controller via `http://"hostname".local`

Network: DHCP is used by default, when enabled the current IP address, netmask, gateway, and DNS servers is shown here.

If DHCP is not enabled these fields will set up the static IP, netmask, gateway, and DNS servers.

13.2 Alarm Recipients & E-Mail Server Settings

Setup the email server, and email addresses to send alarm emails to. Note that when updating the alert addresses only; the SMPT password is not required.

The screenshot shows the 'Alarm Recipients & E-Mail Server Settings' configuration page. It includes the following fields and callouts:

- SMTP Host:** smtp.gmail.com. Callout: "SMTP server and SMPT port to send alarm emails with."
- SMTP Port:** 587. Callout: "Send the alarm email as this address."
- Send as:** chamber_controller@espec.com. Callout: "Send the alarm email as this address."
- Require Authentication:** Checked checkbox. Callout: "The server requires login credentials."
- Require SSL/TLS:** Unchecked checkbox. Callout: "The server requires SSL/TLS encryption."
- SMTP User:** wctest@espec.com. Callout: "The login credentials for the server."
- SMTP Password:** (Empty field). Callout: "The login credentials for the server."
- Alert Addresses:** mmetzler@espec.com. Callout: "The recipients of the alarm alert emails separated by a new line each."

Notes:

- Applying changes will send a test email to all recipients on the list.
- If the server says the email(s) where sent correctly each recipient must confirm that the email was recieved.
- Separate "Alert Addresses" with a new line.
- When updating only the "Alert Addresses" the "SMTP Password" is not required.

Apply

13.3 Logging Configuration

In this section manages the web controller's data logging.

1. To update the sample frequency enter a new value between 10-3600 seconds and press apply. After receiving the green success response restart the web controller via the "Reboot Web Controller" button at the bottom of the page.
2. To clear the data log press the "Clear Log" button.

The screenshot shows the 'Logging Configuration' page. It includes the following fields and buttons:

- Sample Frequency:** 10
- Notes:**
 - Sample Frequency is in Seconds.
 - Sample Frequency must at least 10 Seconds
 - Sample Frequency cannot be larger that 3600 Seconds (10 minutes)
 - Sample Frequency will not be applied until after a restart
- Clear Log** button
- Apply** button

13.4 Firmware Update

Upload a firmware update to the web controller. The web controller will reject all packages not signed by Espec North America.

The screenshot shows a web interface titled "Firmware Update". At the top, there is a header with the title. Below the header, there is a section labeled "Update File (.deb)" with a "Choose File" button and the text "No file chosen". Below this, there is a "Notes:" section with two bullet points: "Firmware updates may take a few minutes." and "Firmware updates will automatically restart the chamber if successful." At the bottom right of the interface is an "Apply" button.

13.5 Time Signal Names

This section will allow custom names to be applied to each time signal.

The screenshot shows a web interface titled "Time Signal Names". It features a table with three columns: "Controller Id", "Time Signal #", and "Name". The first row contains the values "1", "1", and "Test Signal #1". Below the table, there is a "Notes:" section with one bullet point: "Changes the display name for a chamber time signal." At the bottom right of the interface is an "Apply" button.

13.6 REST API/TCP Forwarder Configuration

This section will allow the security of the REST API to be adjusted as well as enabling/disabling the TCP Forwarder.

The screenshot shows a web interface titled "REST API/TCP Forwarder Configuration". It has two dropdown menus: "Rest API" and "TCP Forwarder", both currently set to "Off". Below these, there is a "Notes:" section with three bullet points: "Leave both interfaces disabled if they will not be used.", "Rest API: Authentication is recommended, however to test the API by a web browser 'No Authentication' may be needed. Click here to browse the API...", and "TCP Forwarder: This provides direct TCP access to the controllers communication interface. Authentication cannot be provided for this interface. A reboot must be performed to enable/re-enable this feature." At the bottom right of the interface is an "Apply" button.

- REST API: This allows for a standard universal way to interact with the web controller & chamber, see section 14.1 for documentation. It supports three security modes:
 - Off: Do not allow any access.
 - No Authentication: Allow all access.
 - HTTP Basic Authentication: Use HTTPs built in basic authentication.
- TCP Forwarder: This allows direct access to the chamber controller through the web controller. See section 14.2 for documentation.

13.6 User Account Management

This section will allow an administrator to add, remove, or modify the password of the web controller’s login credentials. The apply button is only used to update passwords.

User Name	Password	Confirm Password	Type	
admin	Password	Confirm Password	Administrator	X
tech	Password	Confirm Password	Technician	X
user	Password	Confirm Password	User	X
User Name	Password	Confirm Password	User	+

Notes:

- The remove(X) button will delete the account immediatly.
- To add an account first enter the account settings then press the Add(+) button.
- **Account Types:**
 - **Guest:** A guest (not logged in) may only access the "Monitor" page.
 - **User:** This account type may access every page except "Program Setup" and "Setup".
 - **Technician:** This account type can access every page except the "Setup".
 - **Administrator:** This account type has full control of all settings.

Apply

1. Adding or removing a user takes effect as soon as the add/remove button is clicked:
 - 1.1. To add an account enter the username, password, confirmation password, use type on the last line and press the add (+) button.
 - 1.2. To remove a user simply click the remove (X) button.
2. To update a user’s password enter the new password/confirmation password for that user and press the apply button. More than one user password may be updated at a time.

13.7 Set Chamber Date/Time

The date and time can be set by pressing the “Set to current date and time” button. Note that doing so may cause gaps or overlaps in the data being logged by the web controller.

13.8 Chamber Interface Configuration

This is where the web controller is setup to communicate with the attached chamber.

- The “Quick Chamber Configuration” allows the configuration to be selected by entering specific parts of the model number as well as the included options.
- The “Configuration File” is used to upload and download custom configurations that cannot be made using the “Quick Chamber Configuration.”

Chamber Interface Configuration

Quick Chamber Configuration

- Use the model map to help fillout the form below, the bold fields are the only ones required to configure the web controller.
- The map will update to reflect the correct format for the choosen model line, not the selected values.
- The controller type will default to the standard controller for the selected Model, only change it if the chamber was ordered specifically with a different controller.

Model Map:
EPL - 4 H
Chamber Size
Type
Model

Model ES: Platinous Sterling

Type L/X: Temperature & Humidity

Controller C: Espec SCP-220

Options

<input type="checkbox"/>	DAP: Dry Air Purge
<input type="checkbox"/>	LN2: Liquid Nitrogen Boost Cooling
<input type="checkbox"/>	LH: Low Humidity Control
<input type="checkbox"/>	LHU: Ultra Low Humidity Control
<input checked="" type="checkbox"/>	PTCON: Product Temperature Control
<input type="checkbox"/>	TS6: Six Extra Time Signals

Notes:

- **Warning:** These settings were either set by the factory or during the setup wizard, unless instructed otherwise do not change them.

Apply

Configurion File

Upload **Download**

14 Programming Interfaces

The web controller provides several interfaces for other software to read/write the parameters of the chamber, these are documented here.

14.1 REST API

The REST API may be browsed by disabling authentication and navigating to “/api/v1.0/” and following the various uri’s given at each address.

14.2 TCP Forwarder

This feature allows a user to connect directly to the controller through the web server. As each controller has its own interface they must be described separately.

14.2.1 Watlow F4T

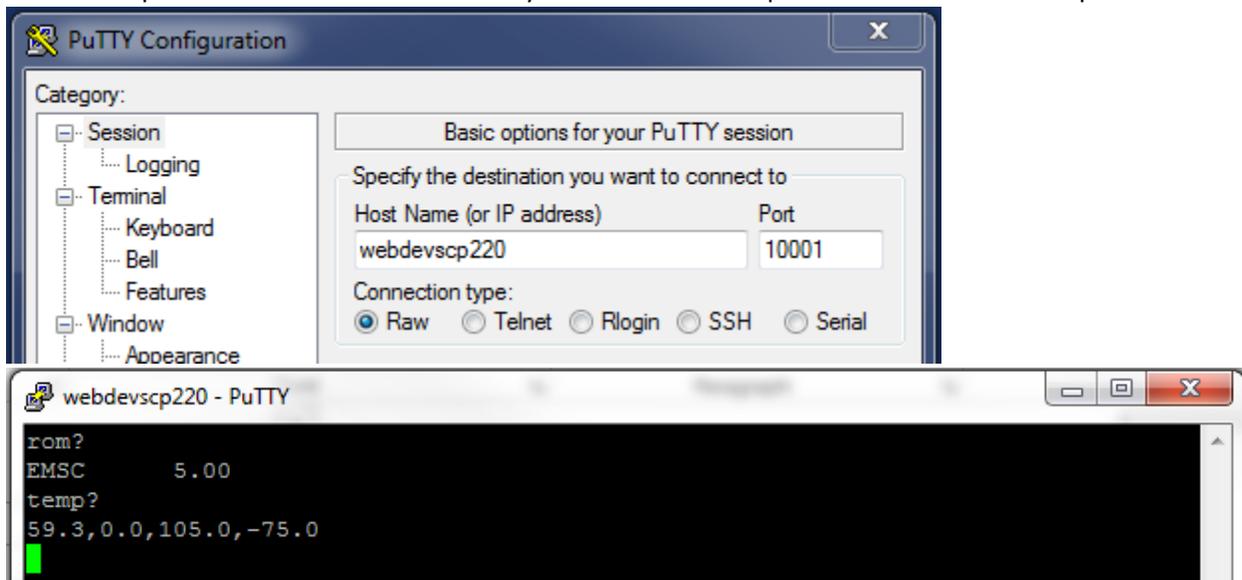
The interfaces protocol provided for the Watlow F4T is MODBUS TCP on port 502. Due to slow performance it is not advised to use the Modbus TCP interface on the web controller but to use the Watlow F4T’s own MODBUS TCP interface.

14.2.2 P300/SCP-220

The TCP forwarder listens for a raw TCP stream on port 10001, and expects the protocol described below: (Note: This is a brief overview, see "P300 or SCP-220 Controller Communications Option Manual" for full details.)

1. The Command data format will be as follows: [command data][delimiter]
 - a. Where [command data] is any command found in the "P300 or SCP-220 Controller Communications Option Manual".
 - b. Where [delimiter] is "CRLF" ie: a carriage return character followed by a line feed character.
2. Each command will return a Response in the following format: [response data][delimiter]
 - a. Where [response data] is one of the following:
 - i. If the issued command queried for data it will return the data in the format described in the "P300 or SCP-220 Controller Communications Option Manual".
 - ii. If the issued command set a parameter in the controller it will return "OK: [command data]" where [command data] is the command that prompted the response.
 - iii. If there was an error executing the command the controller will return "NA: [error message]". Error messages and there meanings are listed in the "P300 or SCP-220 Controller Communications Option Manual". In addition to the error messages listed in the manual this interface also adds the error message "NA: SERIAL TIMEOUT" when the chamber Controller takes too long to respond to the command sent
 - b. Where [delimiter] is "CRLF" ie: a carriage return character followed by a line feed character.
3. The interface will timeout after one hour of no activity.

As an example of communication PuTTY may be used when setup for a raw connection on port 10001:



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