For parts and accessories, service or repairs, call your authorized Central Boiler dealer or heating contractor. Record the information below for future reference.

<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Installation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dealership Name</td>
<td>Phone Number</td>
</tr>
<tr>
<td>Owner Name</td>
<td></td>
</tr>
</tbody>
</table>
How to Use This Guide

The guide is divided into sections to help with the operation of the FireStar Combustion Controller. If questions arise that are not answered with this manual, consult with your authorized Central Boiler dealer.
Overview

FireStar Combustion Controller

The FireStar Combustion Controller uses a number of sensors and sophisticated programming to optimize the operation of the outdoor furnace. The controller will automatically adjust the amount of primary and secondary air to optimize the gasification process, making the outdoor furnace more efficient and clean burning. Some of the variables used by the controller can be changed, allowing you to tailor the furnace operation to your heat load and to the type of wood being burned.

If the controller detects an abnormal condition (for example, the water level is low or the fire has gone out because there is no more wood in the firebox), the controller will display a message to alert you.

Before operating the FireStar Combustion Controller, become familiar with the information the control panel provides and with the procedures for making changes to settings.

1. **Power button** - used to turn the FireStar Combustion Controller on and off. It does not disable all electrical power to the furnace. To disable electrical power to the outdoor furnace, turn off the power using the circuit breaker in the pump compartment.

2. **LED display** - alternates between the furnace water temperature (displays for 6 seconds) and the combustion temperature in the Reaction Chamber (displays for 3 seconds). Other information will also be displayed on the LED display depending on setting, modes, alarms, warnings, etc.

3. **Down arrow button** - if quickly pressed four times, the display will stop alternating and will be fixed on water temperature. The far right decimal point will be illuminated when this feature is active.

4. **Up arrow button** - if pressed during normal operation, the LED display will show the combustion temperature in the Reaction Chamber.
5. **Center menu button** - used to enter the menu system to adjust settings, and to enter changes to those settings when used in combination with the up and down arrows.

6. **Left arrow button** - to lock the controller, quickly press the left arrow button four times. LOCK will display on the LED display.

7. **Status indicator LEDs** - display the current state of furnace operation. A description of the operation of each light is given in the furnace operating modes section of this manual. The Connected LED indicates the status of the controller's wi-fi connection, when enabled.

8. **IGNITION AIR button** - used to bypass the normal door open function. If this button is pressed while the furnace door is open, the primary air actuator will open, helping to light the fire in the firebox.

## Outdoor Furnace Operation

### Power

When the controller is off, the LED display will be off. To turn the controller on or off, press the Power button. Upon startup, the controller will display a number indicating the software version number followed by the furnace model number. Once the controller is on, briefly pressing the Power button will display the software version number. The settings and operation described in this manual are for software version 6.7. Other software versions will operate differently.

### Standby/Idle

After the water temperature has risen above the Water Temperature Setpoint, the controller will go into Idle. When in Idle, the LED will alternate between furnace water temperature and combustion temperature and the fan, primary and secondary air lights will be off. The connected light may be on, depending on wi-fi connection status.
Idle Pulse

While in idle, the combustion fan will start and the primary air actuator will open for a short time every 30 minutes to maintain the coal bed. Air will continue to flow until the temperature in the Reaction Chamber rises above 200°F.

Demand Mode (Low)

When the water temperature drops below the Water Temperature Setpoint minus the Water Temperature Differential, the controller will enter Demand Mode. In Demand Mode, the primary air actuator will slowly open to the correct setting for the furnace model. While the actuator is opening, the Primary status LED will be white. Once the actuator is fully open, the status LED will be red.

Demand Mode (Medium)

In Demand Mode with the primary air actuator open, when the combustion temperature reaches 550°F, the secondary air actuator will start to open and the Secondary status LED will be white. The secondary air actuator will continue to open more as the combustion temperature rises.
Demand Mode (High)

When the combustion temperature reaches 750°F, both the primary and the secondary air actuators will be fully open and their status LEDs will be red.

Idle Transition Mode

As the water temperature setpoint is reached in Demand Mode, the primary air actuator will close to stop combustion and the Primary status LED will turn off. The combustion fan will stay on for a moment with the secondary air actuator open, and then the fan will shut off. The secondary air actuator will close a short time later. This transition mode allows the combustion process to ramp down and burn off the gasification products before the furnace goes into idle.
Door Open

Opening the furnace door automatically places the furnace in Door Open Mode. In this mode, if the Reaction Chamber is above 550°F, the primary air actuator is closed, the combustion fan is on, and the secondary air actuator is open to continually vent gases from the Reaction Chamber until it cools to less than 550°F. The Secondary status LED will be illuminated while the actuator is open. DOOR OPEN will be displayed in the LED display.

Ignition Air

When the water temperature is below the water temperature setpoint, the furnace firebox door is open and the Ignition Air button is pressed, the primary air actuator will open. This will provide air to the upper section of the firebox, helping to ignite a new fuel load. The Primary status LED will display a red light. To exit this mode, close the furnace firebox door or turn the controller off and back on.
Burn Time Monitor

Accumulated Fan Time Since Last Loading

The controller monitors how long the fan has been activated during the current wood load. To view the accumulated fan time for this load, press and hold the \( \text{\textbullet} \) and \( \text{\textbullet} \) button at the same time. This monitor will reset to 00:00 each time the furnace is loaded with wood (i.e., the firebox door is left open for more than 30 seconds). To manually reset this monitor, press the Ignition Air \( \text{\textbullet} \) button.

Easy Refire Burn Time Limit (Optional Feature)

This optional time-based feature can be enabled and operator-adjusted to “shut the furnace down early” in an effort to preserve a portion of the current wood load until the next loading. When appropriate, the word REFIRE may be displayed on the LED display in relation to this mode.
Basic Controller Features

Adjusting Water Temperature Setpoint

The LED display alternates between the furnace water temperature (displays for 6 seconds) and the combustion temperature in the Reaction Chamber (displays for 3 seconds).

To display the water temperature setpoint, press the Menu button.
The controller has been preset at the factory to 185˚F (85˚C). The water temperature setpoint can be adjusted between 170˚F-195˚F (76˚C-91˚C).

NOTE: To reduce condensation in the firebox, it is recommended to set the temperature at or above 185°F (85˚C).

NOTE: If the outdoor furnace overheats or boils over, lower the setpoint.

To change the water temperature setpoint, press and hold the Menu button; then press the button to raise the water temperature setpoint, or the button to lower the water temperature setpoint. After releasing the Menu button, the LED display will indicate the actual temperature of the system water.

Reaction Chamber Temperature Reading

The LED display alternates between the furnace water temperature (displays for 6 seconds) and the combustion temperature in the Reaction Chamber (displays for 3 seconds) during normal operation. To briefly display the Reaction Chamber temperature, press the button. Press the button four times rapidly to display the water temperature without alternating (the right-most decimal point will be illuminated). Pressing the button four more times rapidly or shutting the controller power off and on again will return the LED display to alternate between the furnace water temperature and the Reaction Chamber temperature.

To Lock/Unlock Controller

The controller can be locked to prevent unauthorized access to the controller settings. To lock the controller: Quickly press the button four times. The LED display will indicate LOCKED for several seconds. To unlock the controller: Quickly press the button four times. The LED display will indicate UNLOCKED for several seconds.

NOTE: The controller can be locked while it is off. If the controller is locked while it is off, it will have to be unlocked before it can be turned on.

Power Outage

In the event of a power outage, all controller settings will be saved. When power is restored, the controller will continue operating as it was prior to the power outage.
Setup Mode and Adjusting FireStar Settings

One of the most powerful features of the FireStar Combustion Controller is that it provides you with numerous settings you can customize and fine-tune to the types of wood you are burning and to your heat load. This can help you obtain the cleanest and most efficient operation of your outdoor furnace that is possible.

To Enter Setup Mode

Press and hold the Menu button for 10 seconds until the LED display changes from the water temperature to 1. The controller is now in Setup Mode. If no buttons are selected before ten seconds, the controller will automatically exit Setup Mode.

Changing Control Variables

While in Setup Mode, refer to the Variables Chart and select the control variable you want to change using the or buttons. Press the button to select the variable by menu number. Use the or buttons to adjust the variable to the desired setting. Press the Menu button to save the setting and return to Setup Mode.

To Exit Setup Mode

Wait 10 seconds (without pressing any buttons) and the controller will automatically exit Setup Mode.

To reset controller to default settings:

1. Press the Power button to turn off the controller; then, while pressing and holding the Ignition Air button, press the Power button to turn on the controller. The LED display will momentarily indicate (clear settings).

2. Press the or button to select the furnace model; then press the Menu button to save.

3. Continue to press the button as shown on the display to perform each diagnostic test. The last message will display PRESS UP TO EXIT. Press the button and the controller will run using factory default settings.

4. Verify that the furnace is operating by making sure that the water temperature and the Reaction Chamber temperature are alternating on the screen.

5. If the furnace was connected to the internet prior to resetting to default settings, it will be necessary to enable wi-fi again by setting Menu Item #8 to a value of 1 (see Setup Mode and Adjusting FireStar Settings).
Variables Chart

The Variables Chart displays each user-adjustable variable, its menu number, a brief description, the default setting, and the minimum and maximum values that can be set.

**NOTE:** Menu items not shown are either not adjustable or should not be changed without consulting your Central Boiler dealer.

<table>
<thead>
<tr>
<th>Menu #</th>
<th>Setting</th>
<th>DEFAULT</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WATER TEMPERATURE DIFFERENTIAL</td>
<td>10°F (6°C)</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>IDLE PULSE TIMEOUT</td>
<td>30 (minutes)</td>
<td>0</td>
<td>59</td>
</tr>
<tr>
<td>3</td>
<td>MINIMUM PULSE DURATION</td>
<td>50 (seconds)</td>
<td>0</td>
<td>255</td>
</tr>
<tr>
<td>4</td>
<td>IDLE PULSE TEMPERATURE</td>
<td>200°F (93°C)</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>5</td>
<td>PRIMARY AIR STARTUP PERCENTAGE (IN LOW/MEDIUM DEMAND)</td>
<td>19%</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>SECONDARY AIR (IN HIGH DEMAND) PERCENTAGE</td>
<td>35%</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>7</td>
<td>PRIMARY AIR PERCENTAGE (IN HIGH DEMAND, IDLE PULSE ANDIGNITION AIR)</td>
<td>19%</td>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

1 Classic Edge 350, 2 Classic Edge 550, 3 Classic Edge 750
### Menu # Settings

<table>
<thead>
<tr>
<th>Menu #</th>
<th>Setting</th>
<th>DEFAULT</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
</table>
| 8      | **WI-FI ENABLED**  
After configuration has been performed, use this menu item to disable (or enable) the wi-fi feature without losing your network settings. During a new installation, proceed directly to menu item #9 to enable wi-fi for the first time. | 0       | 0    | 1    |
| 9      | **WI-FI ENABLED CONFIGURATION**  
Setting this to 1 will enable wi-fi and turn on the configuration network. This will erase any current wi-fi settings. When the Connected light turns blue, find the Firestar_network on your smartphone; then visit http://www.wifiset.net to configure your network settings. | 0       | 0    | 1    |
| 10     | **WI-FI WIRELESS N SUPPORT ENABLED**  
When set to 1, the FireStar will be able to use the 5gz frequency (where available). May significantly lower wi-fi range. | 0       | 0    | 1    |
| 11     | **SOFTWARE UPDATE OPTION**  
The FireStar controller has the ability to download and install software updates through the internet. Take note of the current software version number before updating by quickly pressing the Power button once. If required, set this variable to 1 to initiate a software update. A wi-fi connection is required (the connected light should be green). During a software update, furnace operation will stop and the display will flash special characters to indicate the update process. The entire process should take about 5 minutes. Do not disconnect power during this process. In the event of a update failure, BF-4 will be displayed. If an update failure occurs, turn the FireStar off and back on to restore operation to the original software version. Repeated update failures may mean that all available updates are already installed. When an update has completed, you may need to power the furnace back on. Be sure to take note of the new software version number and acquire the appropriate documentation for the new version. | 0       | 0    | 1    |
| 12     | **WI-FI NETWORK SSID (READ ONLY)**  
Displays the current wi-fi network being used by the FireStar. To use a different network, reconfigure the FireStar using menu item #9. | -       | -    | -    |
| 13     | **WI-FI SERIAL NUMBER (READ ONLY)**  
Displays the serial number of the furnace used during wi-fi communication. Typically begins with a letter. An incorrectly entered serial number can be adjusted by visiting http://myfirestar.com/find on a smartphone that is attached to the same wi-fi network as the FireStar. | -       | -    | -    |
| 14     | **WI-FI IP ADDRESS (READ ONLY)**  
Displays the local IP address assigned to your FireStar by your wi-fi router. The FireStar must be successfully connected to wi-fi first. This is a read only item—if a static IP is desired, you must set a reservation on your router by MAC address. | -       | -    | -    |
<table>
<thead>
<tr>
<th>Menu #</th>
<th>Setting</th>
<th>DEFAULT</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>ENABLE REMOTE ADJUSTMENT</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>When set to 1, certain furnace parameters are open to adjustment by the MyFireStar.com site through the internet. The settings and features that may be adjusted through the internet will vary depending on the controller's current software version number.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>SYSTEM TEST</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>When set to 1, a system test is initiated. During the test, press the UP button as shown on the display to perform each diagnostic test. The last prompt will display PRESS UP TO EXIT. After exiting the test, turn the FireStar off and back on to ensure that the furnace returns to normal operation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>N/A (FACTORY HARDWARE CONFIGURATION – DO NOT ADJUST)</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>LOW WATER TEMPORARY OVERRIDE WATER LEVEL SENSOR</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Check the water level at the sight gauge and, if necessary, add water according to the Water Quality and Maintenance section of the Owner’s Manual. If adding water does not clear the LOW WATER alarm, set this variable to 1 to temporarily silence a false LOW WATER level sensor alarm. The controller will operate normally until the next loading (until the firebox door is left open for more than 30 seconds). This will allow operation for one loading (must override each loading) until a repair can be made. Do not override this alarm if the system has a leak. <strong>NOTE:</strong> If water is added to the outdoor furnace and/or system, the system water should be tested and 1650XL Inhibitor Plus should be added (if necessary) to maintain the recommended level of protection.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>ENABLE CELSIUS</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>When set to 1, all temperatures will be displayed in Celsius. Changing between Fahrenheit and Celsius will cause any custom temperature settings to be reset to the factory default settings.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>EASY REFIRE IDLE PULSE ENABLED</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>This setting is only utilized when the optional Easy Refire Burn Time Limit feature has been enabled. When set to 1 and the Easy Refire Burn Time Limit has been met, the Idle Pulse will be present to maintain active coals in the portion of the wood load that is being preserved. When set to 0, no Idle Pulse will be used.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>EASY REFIRE BURN TIME LIMIT: - - - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>This optional timer-based setting will “shut the furnace down early” in an effort to preserve a portion of the current wood load until the next loading. Before adjusting this setting, the operator should have a good understanding of how the Burn Time Monitor works, as well as a good understanding of the current heat load on the furnace.</td>
<td>DISABLED</td>
<td>00:15 (0 hours, 15 min.)</td>
<td>99:00 (99 hours, 0 min.)</td>
</tr>
</tbody>
</table>
LED Display Alarm Definitions

The LED display will display an alarm message when abnormal conditions appear. If any of the following messages appear, take corrective action.

**FIRE OUT**

When the system is calling for heat, if the temperature in the Reaction Chamber has been below 300˚F for 60 minutes and does not rise more than 5˚F, or after three hours even if the temperature is rising, the combustion fan will turn off and the primary air actuator will close. This alarm is reset by opening and closing the furnace door, or by turning the controller off and back on.

**HIGH TEMP1**

The temperature sensor connected to the FireStar combustion controller has detected that the water temperature is above 200˚F. The controller will continue to alternate between HIGH TEMP1, the water temperature, and the Reaction Chamber temperature until it senses that the water temperature has fallen below 195˚F.

**HIGH TEMP2**

The external high limit sensor has sensed that the water temperature is above 200˚F and has disconnected power to the combustion fan and actuators. The controller will continue to alternate between HIGH TEMP2, the water temperature, and the Reaction Chamber temperature until it senses that the external sensor has reconnected power. This will normally happen when the sensor cools to 165˚F.

If this alarm occurs often, lower the water temperature setpoint.

**LOW WATER**

Check the water level at the sight gauge and, if necessary, add water according to the Water Quality and Maintenance section of the Owner’s Manual. If adding water does not clear the LOW WATER alarm, it can be temporarily overridden until a repair can be made (see the Setup Mode section, variable #18).

**NOTE:** If water is added to the outdoor furnace and/or system, the system water should be tested and 1650XL Inhibitor Plus should be added (if necessary) to maintain the recommended level of protection.
REFIRE / REFIRE OUT

The furnace has shut down because the optional Easy Refire Burn Time Limit has been met. This alarm is reset automatically during the next loading (when the firebox door is left open for more than 30 seconds). Pressing the Ignition Air button will also reset this alarm.

LOCKED

This will be displayed when any button is pressed while the controller is locked. When the controller is locked, all buttons are disabled. To lock and unlock the control, quickly press the left arrow four times.

UNLOCKED

This will be displayed once after unlocking the controller.

BYPASS

The bypass door is open (if applicable to your model).

DOOR OPEN

The firebox door is open.

TC1, TC2 or TC3

If the display indicates any of these messages, contact your dealer.

A-1

Thermocouple Failure: The thermocouple in the Reaction Chamber outlet has been damaged or disconnected. The LED display will flash A-1 to indicate that the system is no longer operating at optimal efficiency. Contact your dealer immediately. To “hide” this alarm, press the and buttons at the same time. Doing so does NOT erase the alarm or fix the problem.

STEP FAIL 1, STEP FAIL 2

If the display indicates one of these messages, it indicates a protection fault to one of the stepper motor drives. This can be caused by a high temperature inside the controller enclosure. Power the controller off and back on to clear this alarm. If the alarm recurs, contact your dealer.

EF

The message will indicate that the controller was unable to recover from a memory failure. All settings will be reset to the factory default settings and will not be saved if the controller is turned off or power is interrupted. In the event of a power outage, the controller will not restart when power is restored. Contact your dealer.
Connecting FireStar Combustion Controller to Wi-Fi Network

The FireStar Combustion Controller’s integrated wi-fi allows you to connect to your local wi-fi network and take advantage of the online features when you create an online account.

YOUR WIRELESS NETWORK AND FURNACE INFORMATION

Record information about your home’s wireless network and your furnace.

_____________________________________________________________
Wireless Network Name

_____________________________________________________________
Wireless Network Password

_____________________________________________________________
Your Furnace Serial Number

CONNECT TO YOUR WI-FI NETWORK

1. Disconnect power to the furnace.
2. Using a 1/4” nut driver or socket, remove the two screws and open the control panel.
3. Remove the round plug on the left side of the control.
4. Install the grommet into the hole.
5. Align the antenna through the grommet and tighten it onto the gold threaded connector installed on the side of the control panel. Take care not to cross-thread the antenna and damage the threads on the connector.
6. Connect power to the furnace and turn on the control.
7. Press and hold the center Menu button until 1 is displayed.
8. Turn on the wi-fi configuration network by pressing the up or down arrow until menu #9 is displayed. Press the right arrow to display the setting stored in menu #9. Use the up arrow to change this setting to 1. Press the center Menu button to store this setting. The connected light will start flashing blue.
9. Watch the connection LED as the control enters wi-fi setup mode. When the LED is a steady blue (not flashing), the control is ready to be configured.
10. On a smartphone or other wi-fi enabled device, find the Firestar_XXXX network and connect to it.

11. Using a web browser on the connected device, navigate to www.wifiset.net. You may need to "refresh" your browser a few times before it will load.

12. Your browser will display the FireStar Setup page. Select the wi-fi network SSID you would like to connect to. Select your wi-fi security type and enter your wi-fi password and furnace serial number (SSID and password are case-sensitive).

13. Click the connect button. The control will now turn off the configuration network and attempt to connect to your selected wi-fi network.

14. The connection LED will flash blue while it is attempting to connect. When the LED is a steady green, the control is connected to your network.

15. If the control fails to connect, the connection LED will be steady red. Verify your personal wi-fi network’s SSID and password before performing the setup steps again.

**MYFIRESTAR.COM ACCOUNT**

Connecting your FireStar to your home’s wireless network will allow you to take full advantage of the online features. Create your online account at MyFireStar.com and access information about your furnace from anywhere via your web browser, smartphone or other web-enabled devices.

Record your User Name and Password once you have created them for your MyFireStar.com account.

```
User Name

Password
```