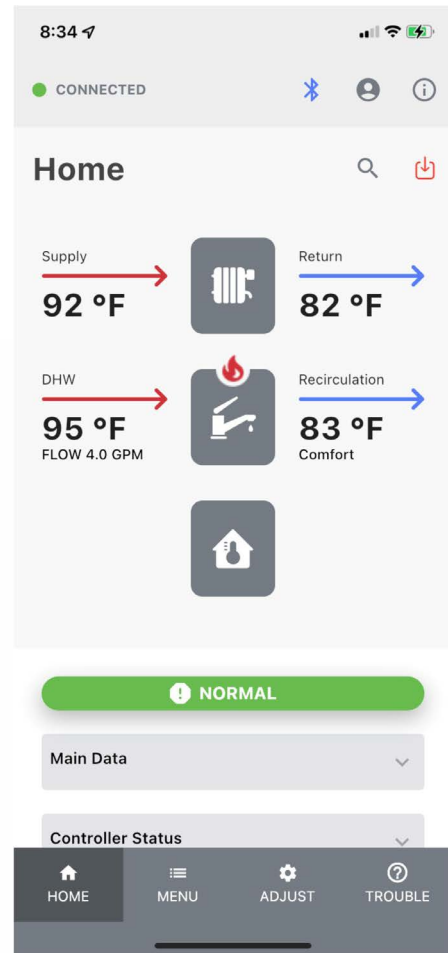


# PATCONNECT

## BLUETOOTH ADAPTOR

### Instruction Manual

Manual Contents	Page
• Introduction.....	2
Getting Started.....	4
• App Download.....	4
• Connecting Bluetooth Adaptor.....	5
• App Connection.....	8
Monitoring.....	9
• On Site.....	9
• Remote Support.....	10
Commissioning/Setup.....	11
• Startup Wizard.....	11
• Adjust Menus.....	12
Troubleshooting.....	13
• Troubleshooting Wizard.....	13
• Alarm Menus.....	14
Service.....	15
• Service Wizard.....	15
Resources.....	16
• Manuals.....	16
Bluetooth Adaptor Update.....	17
Phantom Control Updates.....	18
Appendix.....	19
• Specifications.....	19
• Repair Parts.....	22
• Troubleshooting Tips.....	23



### DANGER

Before making any setting changes, installing or servicing this boiler, follow all instructions including DANGER, WARNING, CAUTION, and NOTICE hazard notifications found in boiler Installation, Operating and Service Instructions provided with boiler and available through PAT-Connect app.

**NOTICE:** Only use the Bluetooth Adaptor while on site. Never leave the Bluetooth Adaptor on site and connected to boiler.

Need help or have a question?  
Contact Customer Support at (215)535-8900

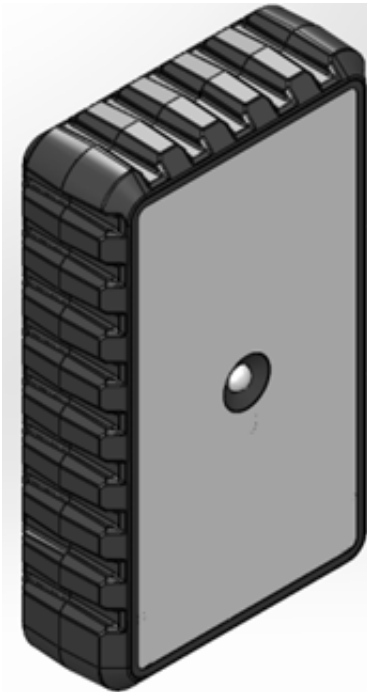
111680-03 - 10/23



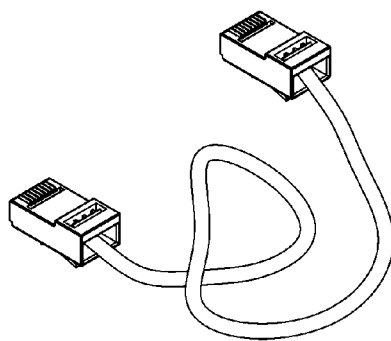
# Introduction

PAT-Connect is a commissioning, diagnostic and service tool consisting of a Bluetooth Adaptor and mobile device app. The app communicates with any Velocity Boiler Works condensing boiler. PAT-Connect is a local service tool with portal data collection and live streaming to enable remote support.

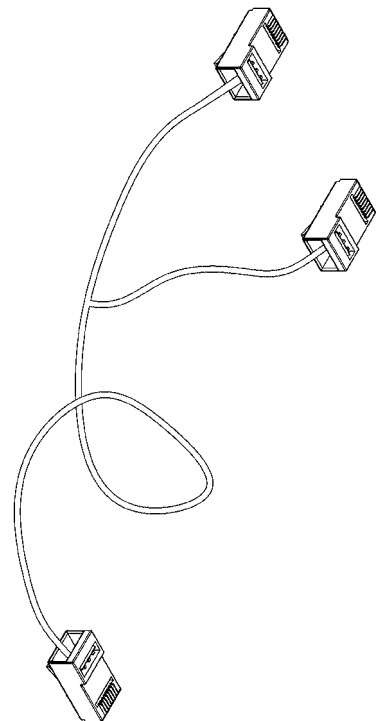
## Included with the Bluetooth Adaptor:



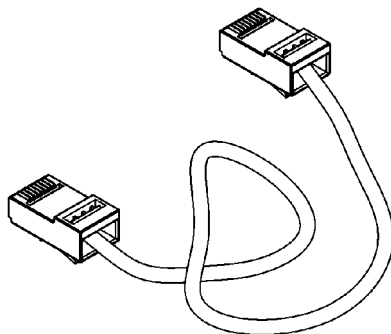
**PAT-Connect Bluetooth Adaptor**



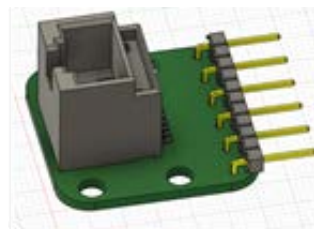
**Cable 1,**  
RJ12 Straight Cable,  
36-inch, Silver  
For Phantom II Boiler



**Cable 2,**  
RJ45 Split Cable,  
24-inch, Black  
For Sage Controller  
Equipped Boiler



**Cable 3,**  
RJ45 Straight Cable,  
36-inch, Blue  
For Direct Connection  
to Sage Controller



**111640-01,**  
Sage J3 Terminals to  
RJ45 Interface Board,  
For Direct Connection  
to Sage Controller

## Compatible Devices:

Apple device, an iPhone or iPad, running iOS version 13 or newer.

Android device, mobile phone or tablet, running Android version 10 or newer.

## Compatible Boilers:

Phantom, Phantom II, Phantom Combi, Phantom-X, Raptor, Raptor Combi Shadow.

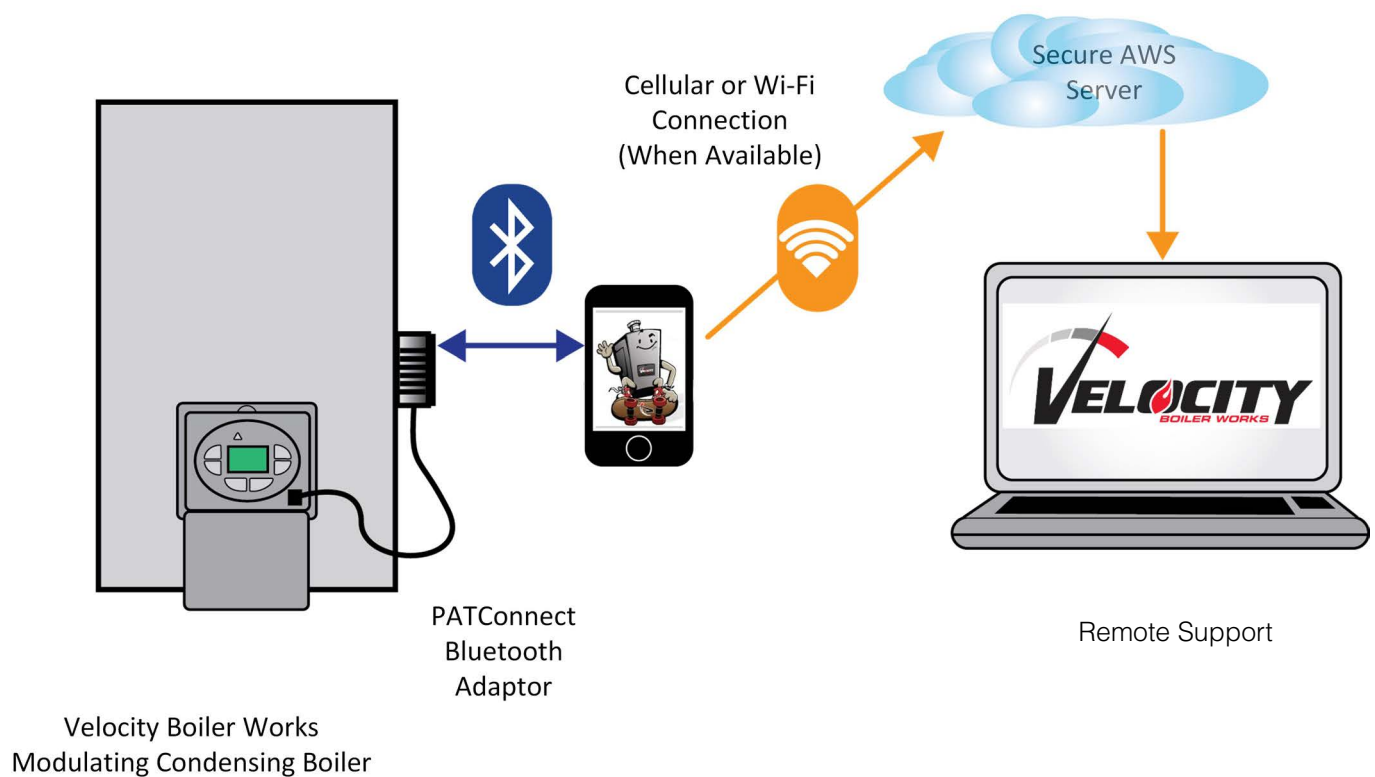
## Introduction (continued)

### PAT-Connect Features:

- Bluetooth Adaptor connects boiler to PAT-Connect App.
- English and Spanish Language.
- Start-up, Troubleshoot and Service Wizards.
- Data logs, Service & status reports sent to cloud.
- Phantom Boiler Control firmware updates.

### Portal Features:

- Stores reports, data logs, site photos and alarm history.
- Real-time remote support when signal available.



# Getting Started

## Step 1: Install App

IOS

Go to App store

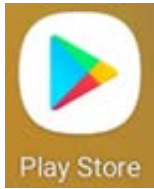


Download PAT-Connect



Android

Go to Play store

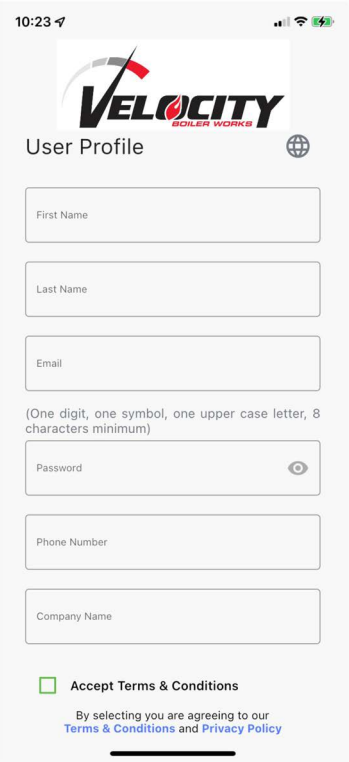


Download PAT-Connect

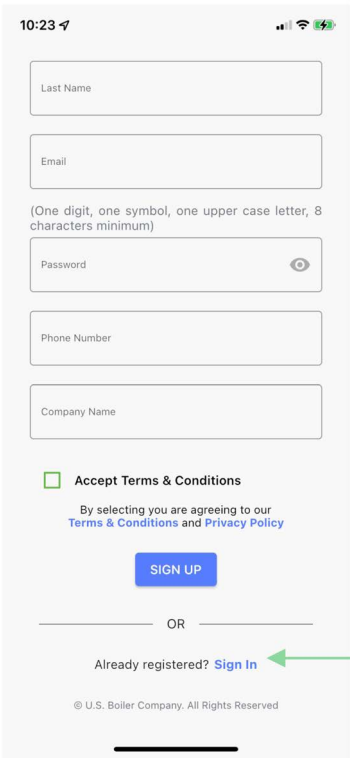


## Step 2: Create User Account

Fill out profile and review and accept Terms and Conditions, Privacy Policy:



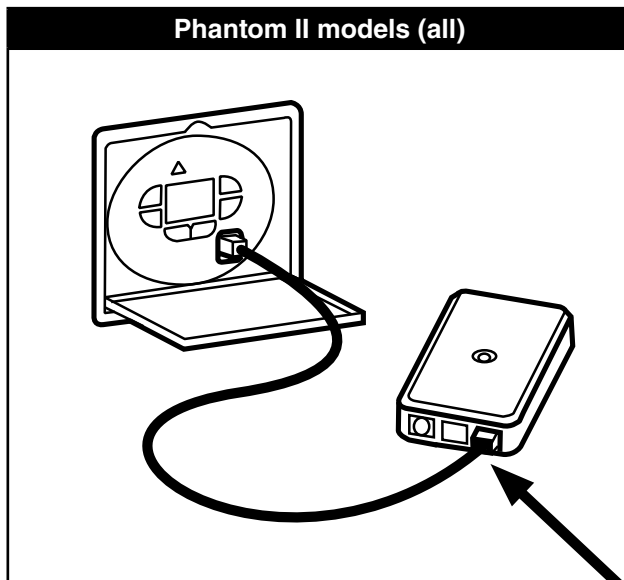
Existing User select Sign In:



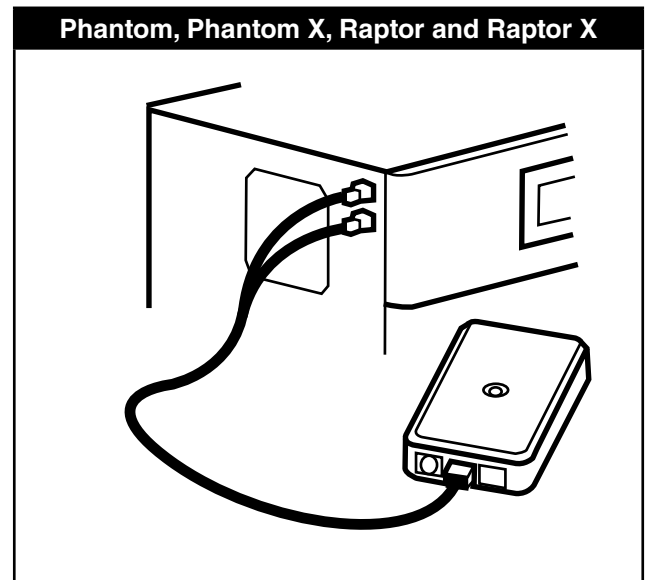
Select Here  
If Already  
A User

## Getting Started (continued)

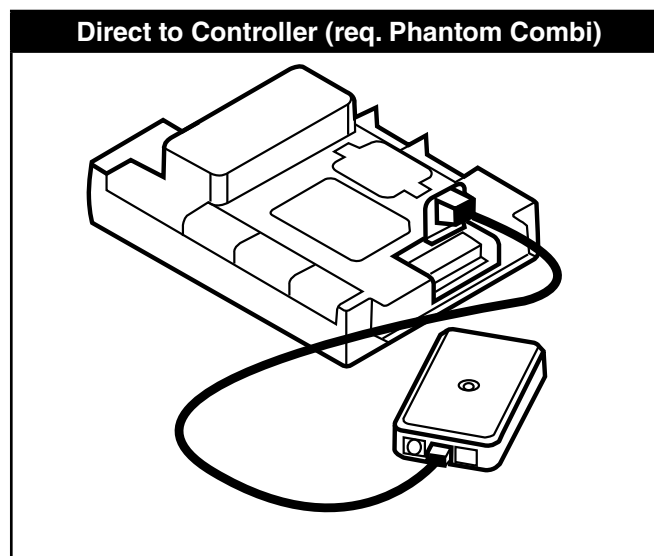
### Step 3: Connect Bluetooth Adaptor



**CABLE 1**  
RJ12 Straight Cable,  
36-inch, Silver  
For Phantom II Boiler



**CABLE 2**  
RJ45 Split Cable, 111662-01  
24-inch, Black  
For Sage Controller Equipped Boiler



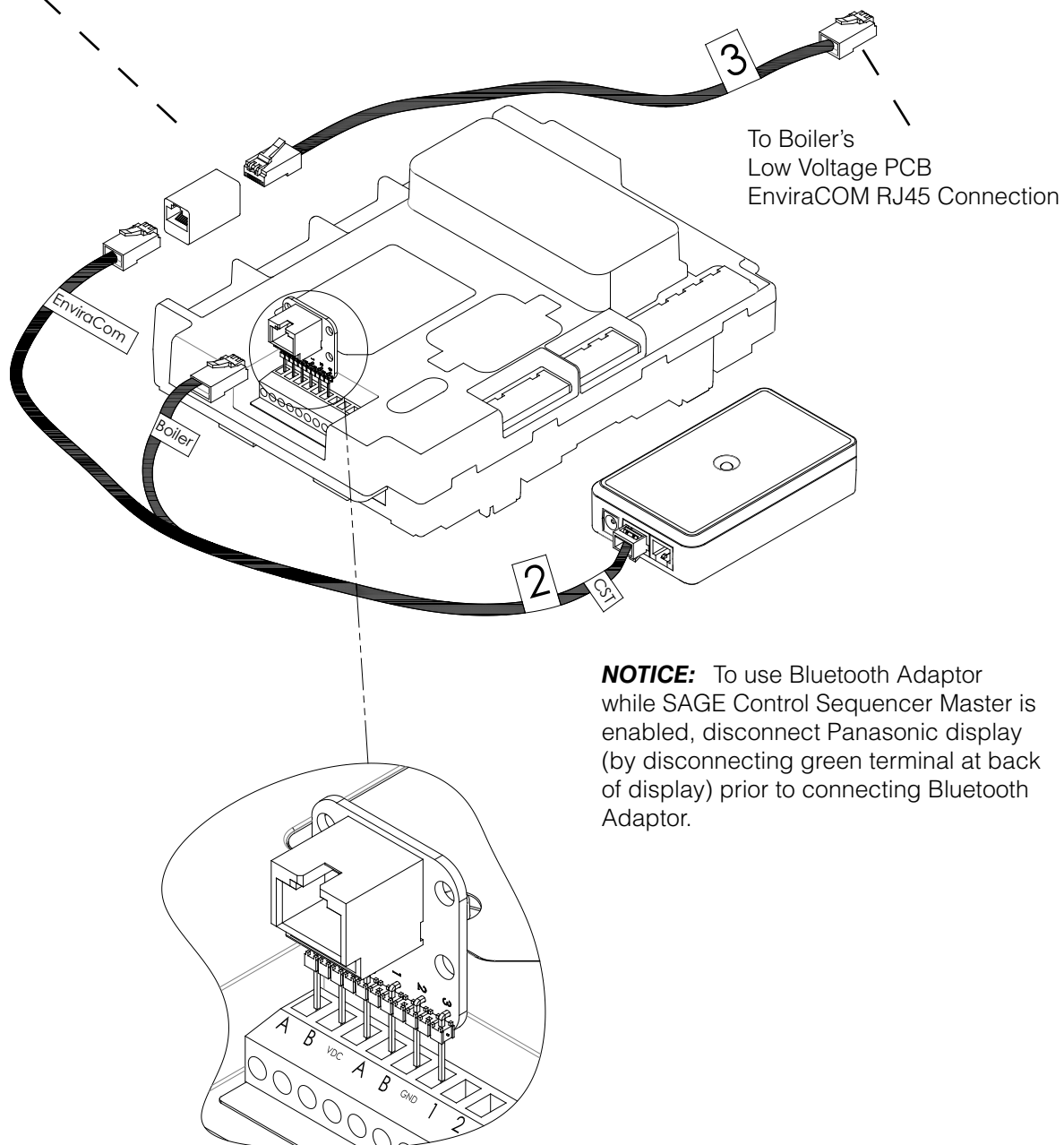
**CABLE 3**  
RJ45 Straight Cable,  
36-inch, Blue, plus Sage J3  
Terminals to RJ45 Interface Board 111640-01,  
For Direct Connection to Sage Controller

## Getting Started (continued)

### Step 3: Connect Bluetooth Adapter (continued)

#### Sage Controller Equipped Boiler with Sequence Master Enabled

Ethernet Cable Extender F/F Inline  
RJ45 Coupler Connector  
(Supplied by others)



**NOTICE:** To use Bluetooth Adaptor while SAGE Control Sequencer Master is enabled, disconnect Panasonic display (by disconnecting green terminal at back of display) prior to connecting Bluetooth Adaptor.

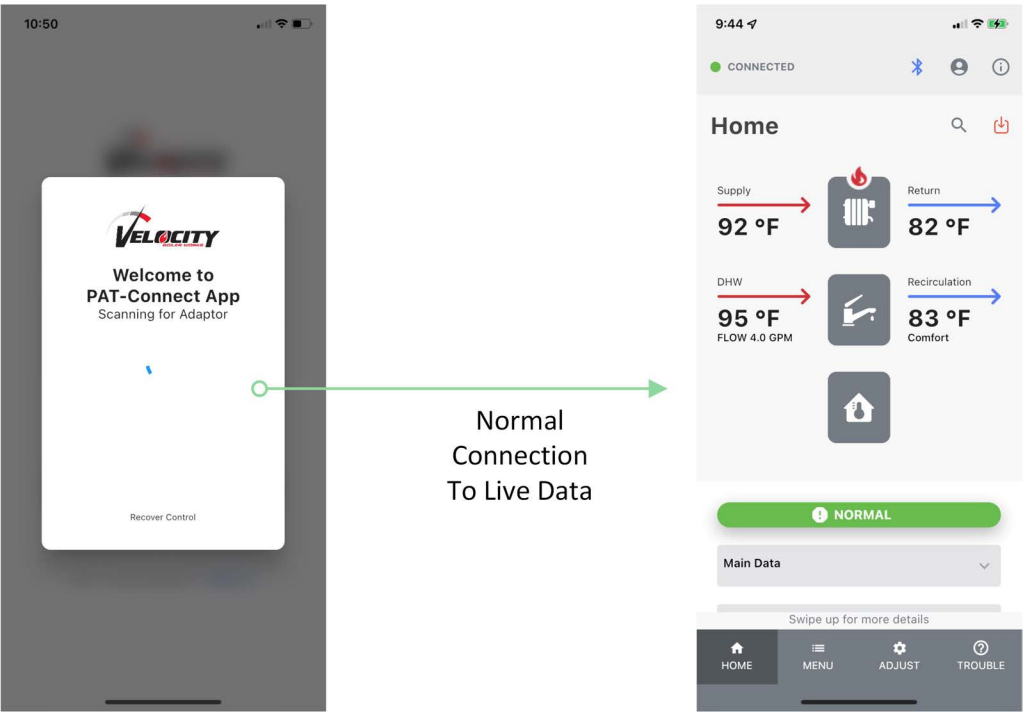
CABLE 2, CABLE 3, RJ45 Interface Board 111640-01 and  
"Ethernet Cable Extender F/F Inline  
RJ45 coupler Connector"  
(Supplied by others)

# Getting Started (continued)

## Step 4: Using App

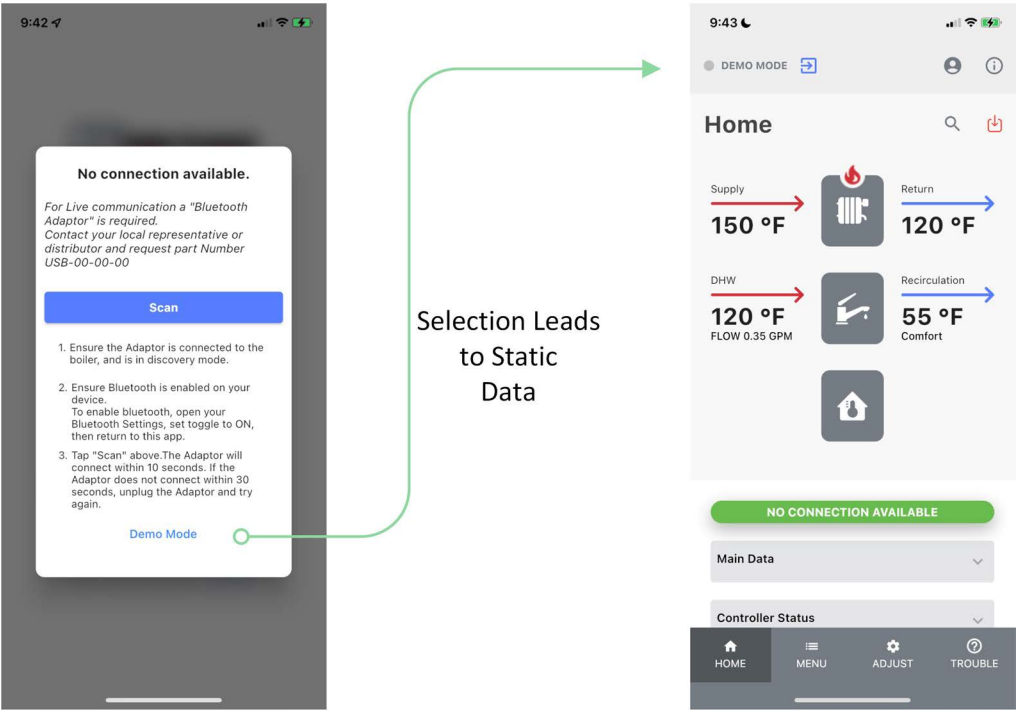
### Launch App

Before opening the App, connect Bluetooth Adaptor and wait for LED light to turn solid green.



### Demo Mode

When not near a boiler or Bluetooth Adaptor a user may view an Phantom Boiler Demonstrator Mode to review available options, manuals, and alarm descriptions



If having trouble connecting, see **Appendix**, Specification for Bluetooth Adaptor LED blink codes and Troubleshooting Tips.





# Getting Started (continued)

## Step 5: Sign into PAT-Connect Web Portal

After you have completed your profile using the PAT-Connect App, Velocity Boiler Works customer service will send you an invitation to sign into the web portal where you can view status, service reports and live data when a cell signal is available.

### Web Portal

[pat.velocityboilerworks.com](http://pat.velocityboilerworks.com)

Velocity Boiler Works - PAT Connect Web Portal Login  

→ noreply@pat.velocityboilerworks.com  
to pcloonan1+crown2

10:04 AM (3 hours ago) ☆ ↶ ⋮



#### Velocity Boiler Works - PAT Connect Web Portal Login

Hello Lee,

Thank for registering to use the Velocity Boiler Works - PAT Connect App! This app is supported by our Velocity Boiler Works - PAT Connect Web Portal.

#### What is the Velocity Boiler Works - PAT Connect Web Portal?

When you connect to one of our condensing boilers via the app, you will be able to save reports, data logs and site photos directly to the portal for access at any time!

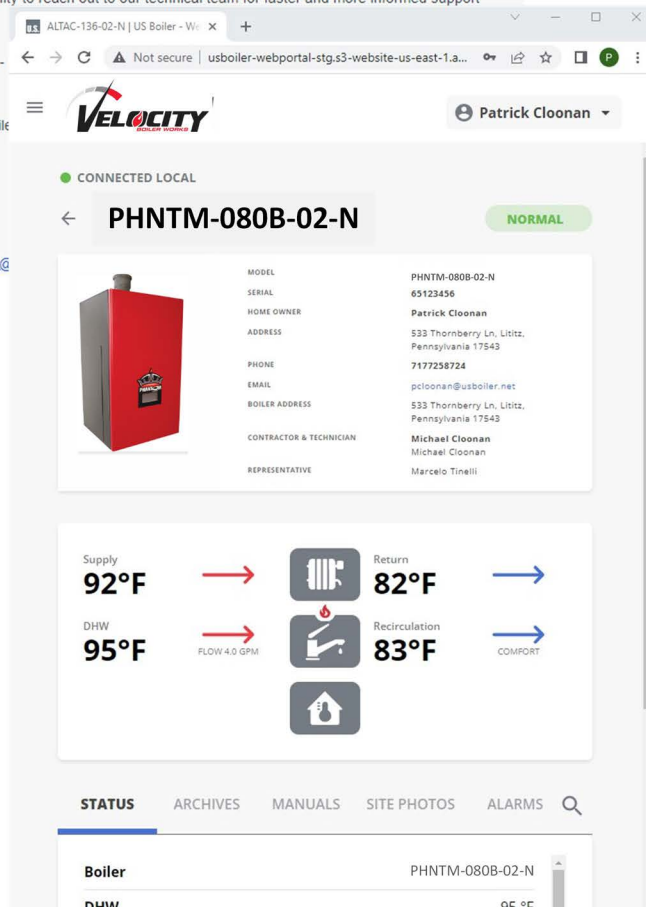
Please note that your company's technicians, local Velocity Boiler Works sales representative, and Velocity Boiler Works's Technical Service team will also have access to stored boiler data on the web portal. This includes reviewing LIVE boiler data when you are on-site and connected to a boiler via the app and a cell signal is available. Live boiler data gives you a unique opportunity to reach out to our technical team for faster and more informed support if needed.

Your new Velocity Boiler Works - PAT Connect App and Velocity Boiler Works - tools available!

Ready to sign into your Web Portal? Simply click on the 'Sign into Velocity Boiler Works' button. We'll have you up and running in no time.

[Sign into Velocity Boiler Works - PAT Connect Web Portal](#)

If you did not initiate this request, please contact us immediately at [webadmin@velocityboilerworks.com](mailto:webadmin@velocityboilerworks.com)



The screenshot displays the Velocity Boiler Works PAT Connect Web Portal interface. At the top, the user is logged in as Patrick Cloonan. The main section shows the boiler model PHNTM-080B-02-N with a status of NORMAL. A table lists boiler details: MODEL (PHNTM-080B-02-N), SERIAL (65123456), HOME OWNER (Patrick Cloonan), ADDRESS (533 Thornberry Ln, Lititz, Pennsylvania 17543), PHONE (7177258724), EMAIL (pcloonan@usboiler.net), BOILER ADDRESS (533 Thornberry Ln, Lititz, Pennsylvania 17543), CONTRACTOR & TECHNICIAN (Michael Cloonan), and REPRESENTATIVE (Marcelo Tinelli). Below the table, a live data dashboard shows Supply temperature at 92°F, Return at 82°F, DHW at 95°F, and Recirculation at 83°F. A flow rate of 4.0 GPM is also indicated. The bottom navigation bar includes links for STATUS, ARCHIVES, MANUALS, SITE PHOTOS, and ALARMS. The STATUS section is currently active, showing the boiler model and DHW temperature.

MODEL	PHNTM-080B-02-N
SERIAL	65123456
HOME OWNER	Patrick Cloonan
ADDRESS	533 Thornberry Ln, Lititz, Pennsylvania 17543
PHONE	7177258724
EMAIL	pcloonan@usboiler.net
BOILER ADDRESS	533 Thornberry Ln, Lititz, Pennsylvania 17543
CONTRACTOR & TECHNICIAN	Michael Cloonan
REPRESENTATIVE	Marcelo Tinelli

Supply 92°F → Return 82°F  
DHW 95°F → Recirculation 83°F  
FLOW 4.0 GPM → COMFORT

STATUS ARCHIVES MANUALS SITE PHOTOS ALARMS

Boiler PHNTM-080B-02-N  
DHW 95 °F

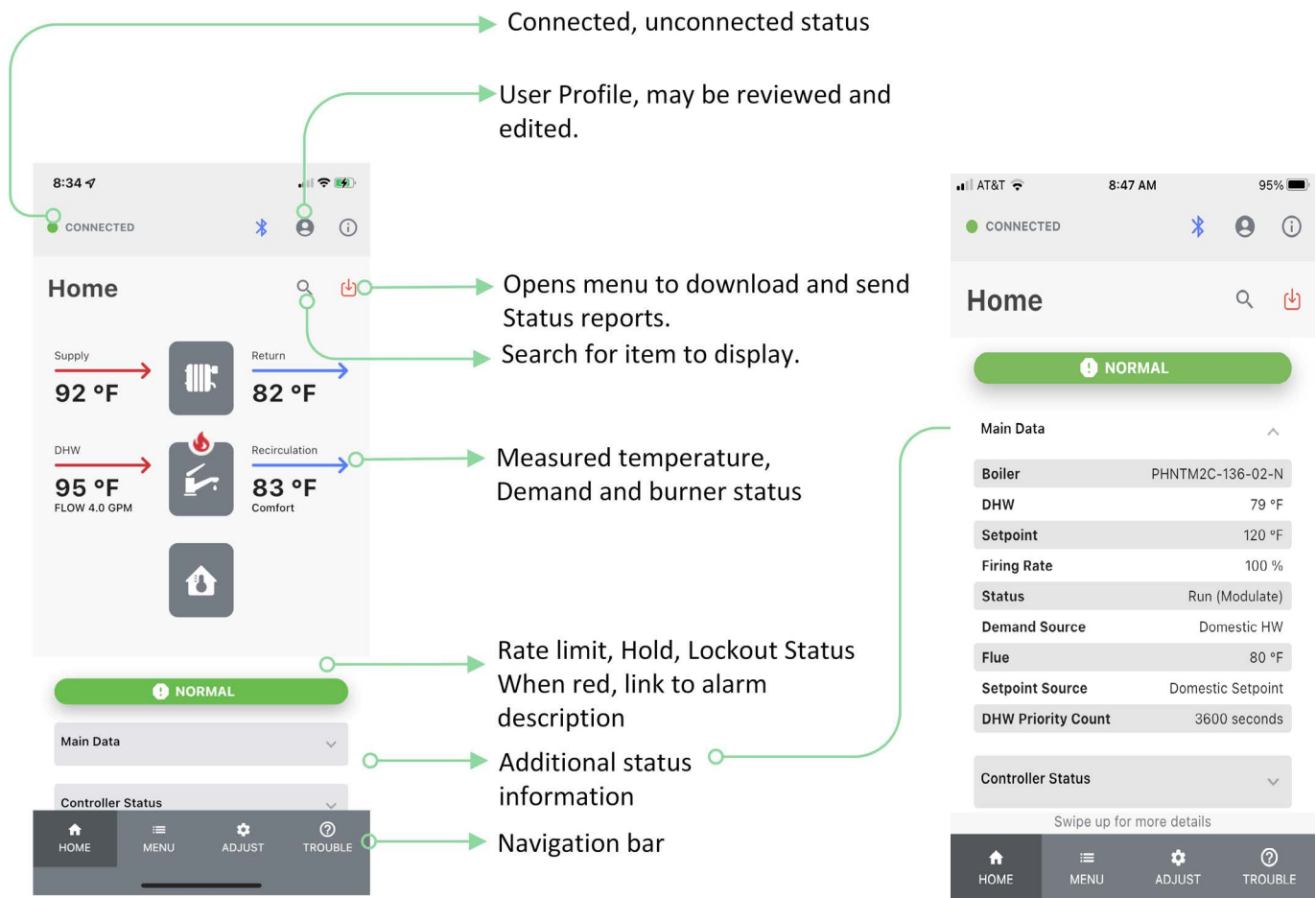
If you do not receive an invitation email, call customer service at (215)535-8900



# Monitoring

## On Site

Home screen provides water temperatures supplied to and returning from heating elements and faucets. At a glance the user is aware of the current demands and burner status. Additional information is available from Main Data, Controller Status, Input/Output Status, as well as Zone Panel Status and Sequencer Status when used.



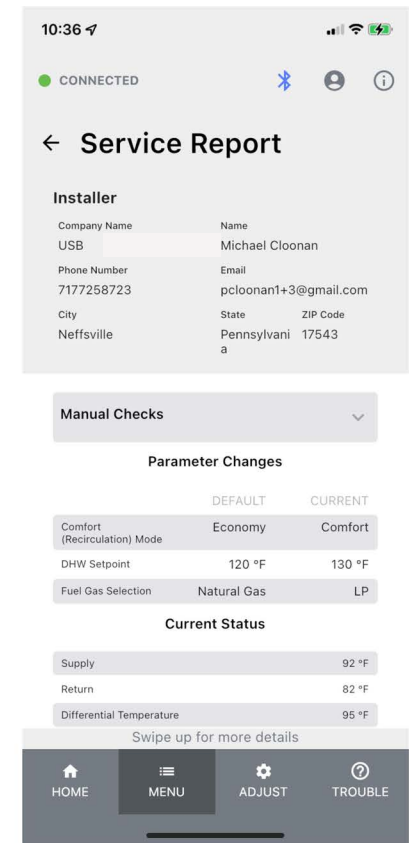
# Monitoring (continued)

## Remote Support

App offers reports, site photos and data logging to document boiler performance and aid remote support. Reports, site photos, and logs may be email and/or stored on devices as pdf or csv files. All files are archived at portal.

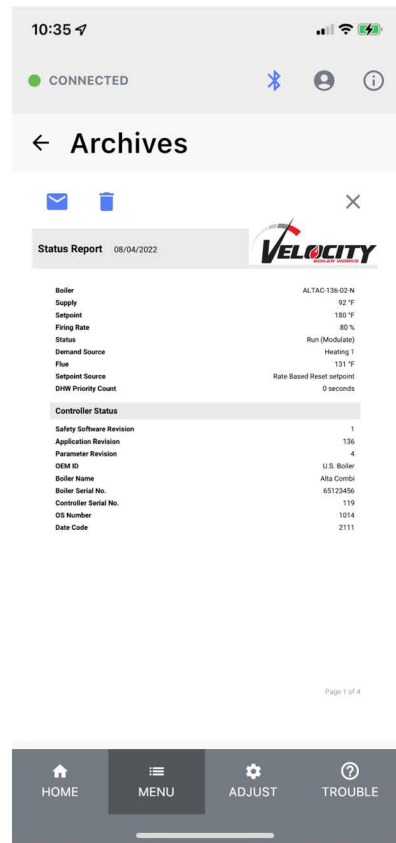
### Status Report

Current boiler status, “snapshot”.



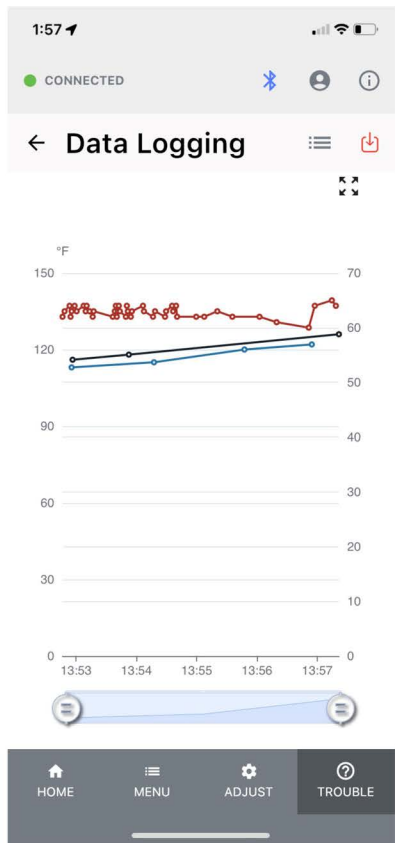
### Service Report

Status, cycle & alarm history and actions taken.



### Data Logging

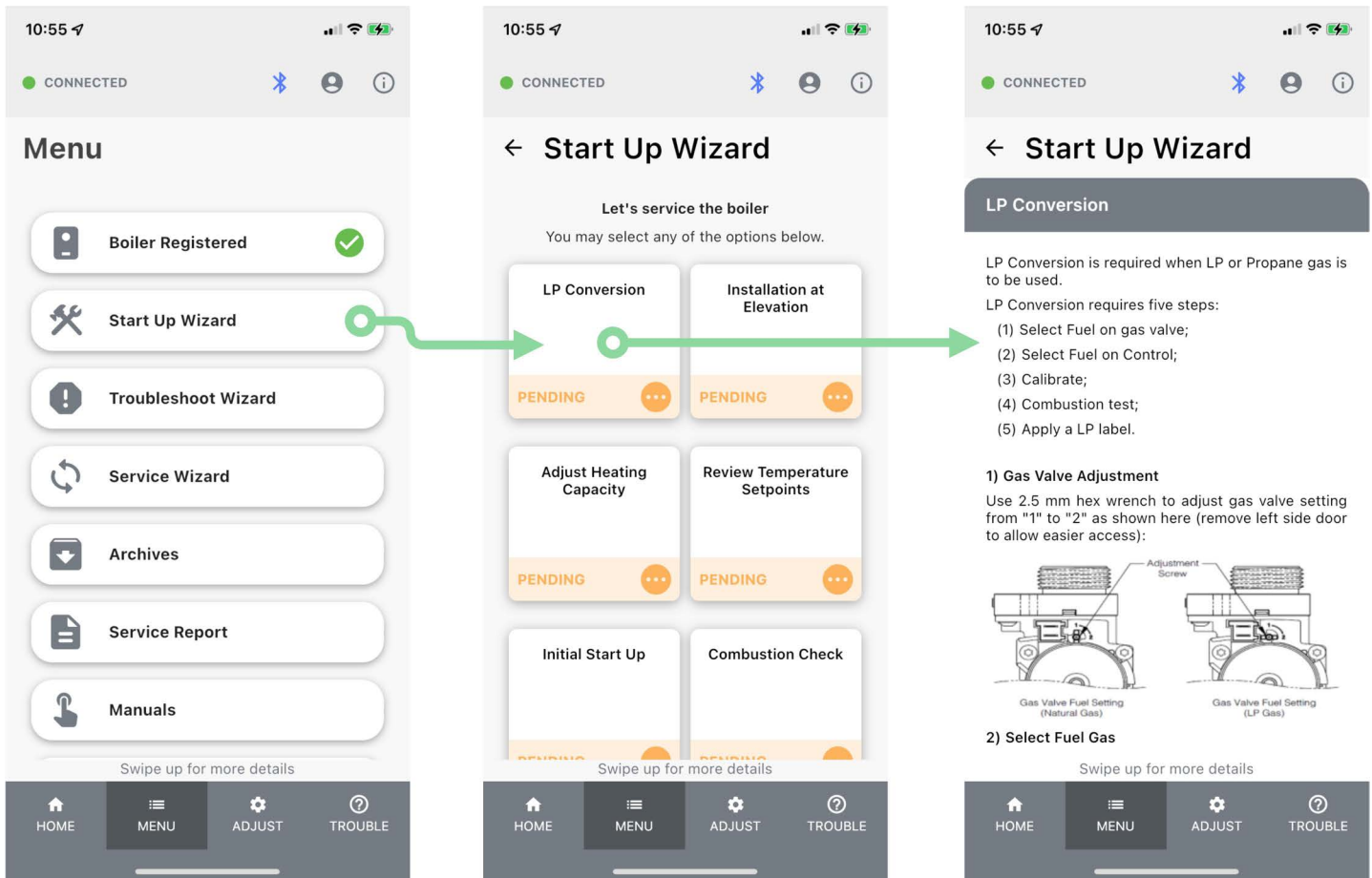
Data is sorted while Bluetooth adaptor is connected.



# Commissioning/Setup

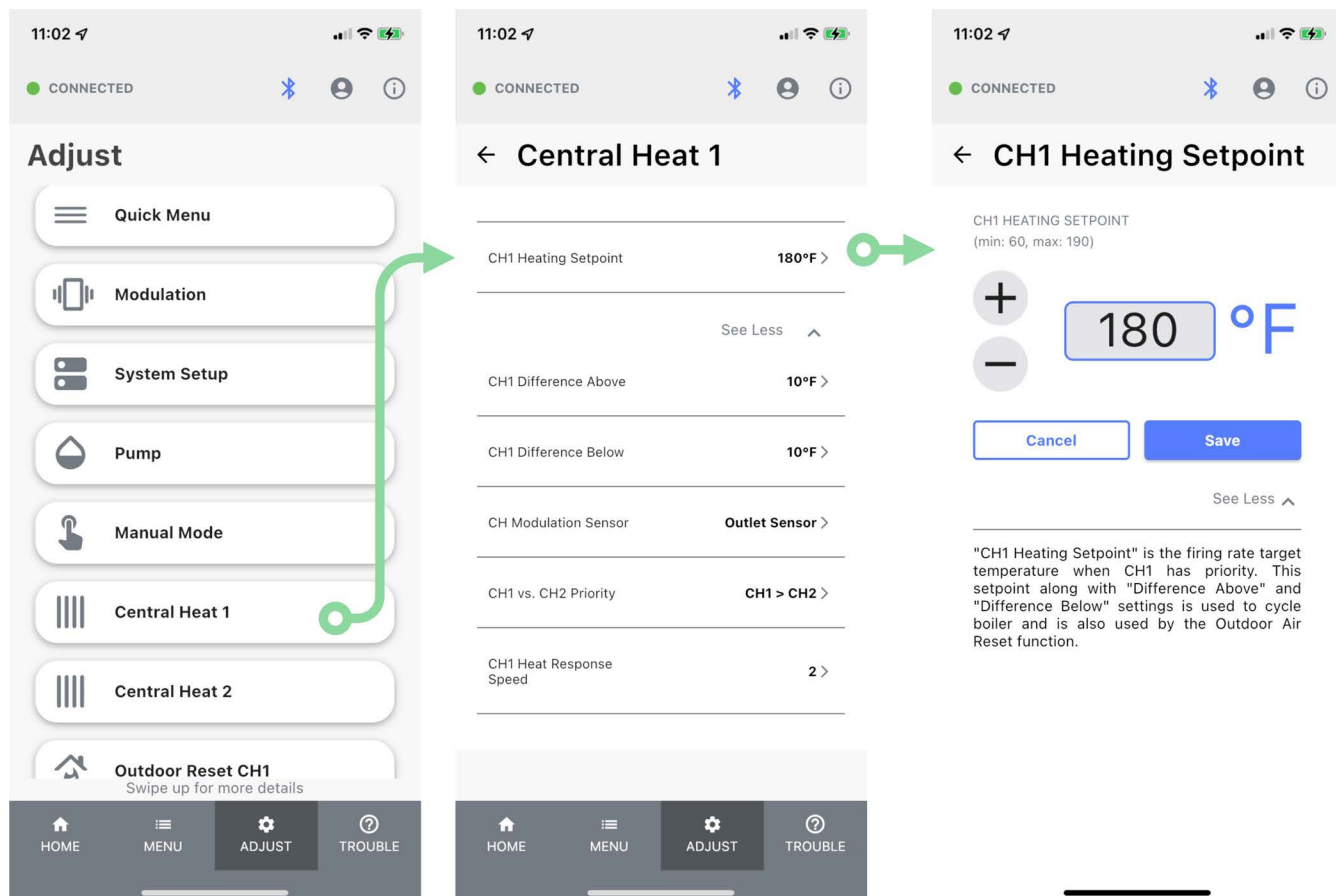
**Start Up Wizard** is provided to walk users through most common setup tasks.

Start-up Wizard collects instructions, status, and key parameter adjustment together to allow required actions to be as easy and successful as possible.



## Commissioning/Setup (continued)

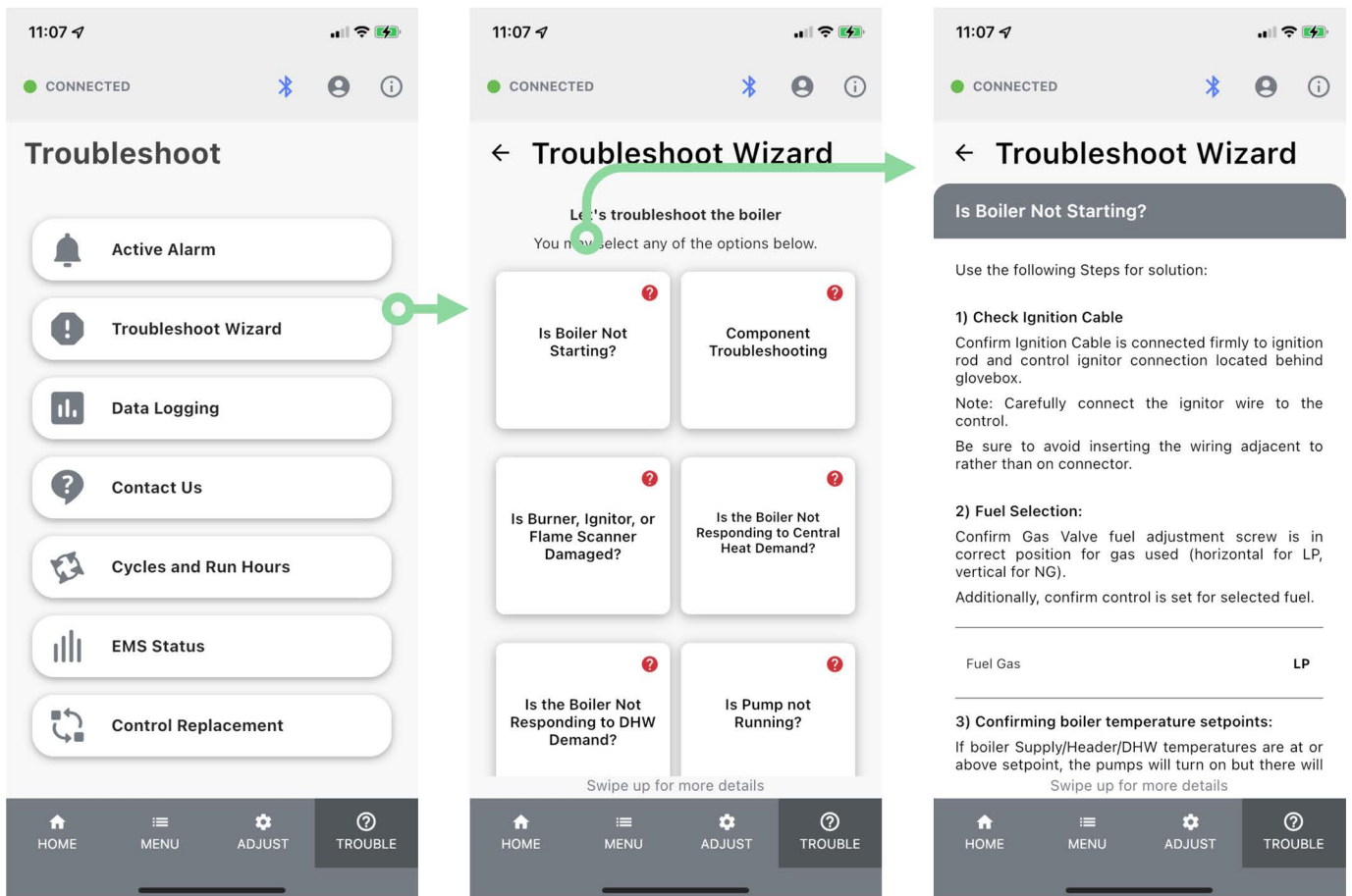
**Adjust menus** provide opportunity to adjust advanced settings. Each setting is provided with adjustable range and detailed explanation.



# Troubleshooting

**Troubleshooting Wizard** is provided to walk users through solving common issues.

Troubleshooting Wizard collects instructions, status, and key parameter adjustment together to allow contractors to investigate efficiently, step by step.



# Troubleshooting (continued)

Active Alarm provide detailed explanation, possible cause and solution to every alarm.

11:15

CONNECTED

Troubleshoot

Active Alarm

Troubleshoot Wizard

Data Logging

Contact Us

Cycles and Run Hours

EMS Status

Control Replacement

HOME

MENU

ADJUST

TROUBLE

11:15

CONNECTED

← Active Alarm

Active Alarm

Supply High Limit

Reset Lockout

Alarm History

Supply High Limit

Delete Error History

HOME

MENU

ADJUST

TROUBLE

11:15

CONNECTED

← Lockout E04.1

Supply High Limit

Supply Temperature is higher than 210°F (99°C) or (when used) Preferred Outlet/Flow High Limit (Manual Reset Lockout Limit).

1. Possible Cause

Heating load at time of error below minimum firing rate of boiler

Solution

Test individual zones and ensure proper zone sizes.

2. Possible Cause

System pump, thermostat, zone valve or panel problem?

Solution

Check pump operation, replace if necessary.

PDF

Swipe up for more details

HOME

MENU

ADJUST

TROUBLE

11:15

Step	Troubleshooting Question	Actions	Conclusion
1	Is system pump demand ON?	Check Home Screen under Input/Output Status to see if the boiler pump is ON.	If OFF provide a heat demand at 2. Confirm system output indicates "ON". (External heat input is located on the low voltage terminal strip. Must have contact closure to enable pump)
2	Is system pump ON?	Check voltage and amperage at pump. Confirm prior to test that pump is not air-bound.	If voltage and/or amperage are within specs and motor does not run replace pump. If voltage is normal and amperage is high pump may be stuck or have a bad capacitor. Replace pump. If system pump output shows "ON" and no voltage is present at pump go to step 3.
3	Did pump fuse blow?	Remove power from boiler. Remove ignition cable from flame sensor and remove vent from right side of control panel. Allow door to fully open, and remove four fasteners holding rear cover to control panel. Remove TS 50A fuse (Pump fuse is located to the far right side of the fuse block) and, using a multi-meter perform a continuity test.	If BLOWN replace fuse. Proceed to step 4. If NOT BLOWN go to step 5.
4	Did fuse blow again?	Turn power back on. Did fuse blow again? Remove power from boiler. Remove TS 50A fuse and, using a multi-meter perform a continuity test.	If fuse blows a second time disconnect all pumps and then check for short to ground. Reconnect 1 pump at a time to isolate which pump is causing the issue. Identify and correct fault. If NOT BLOWN go to step 5.
	Is there 120VAC at the fuse block?	Check 120VAC at system pump	If VOLTAGE is present repair

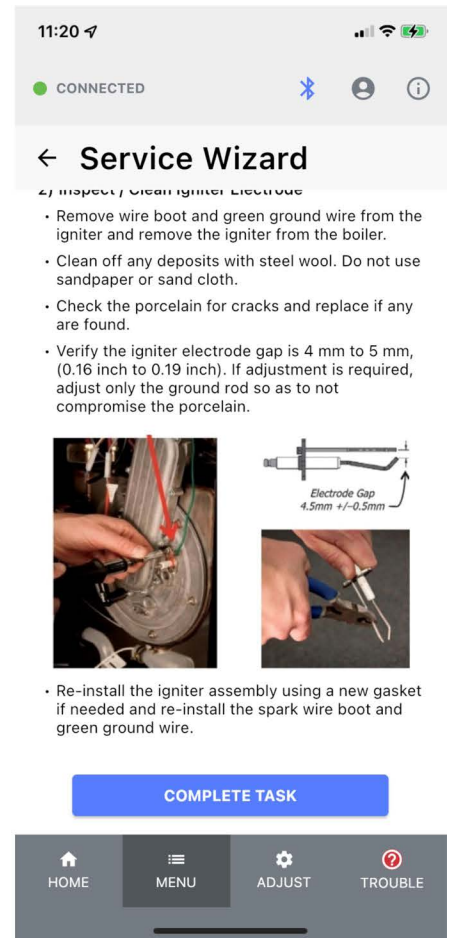
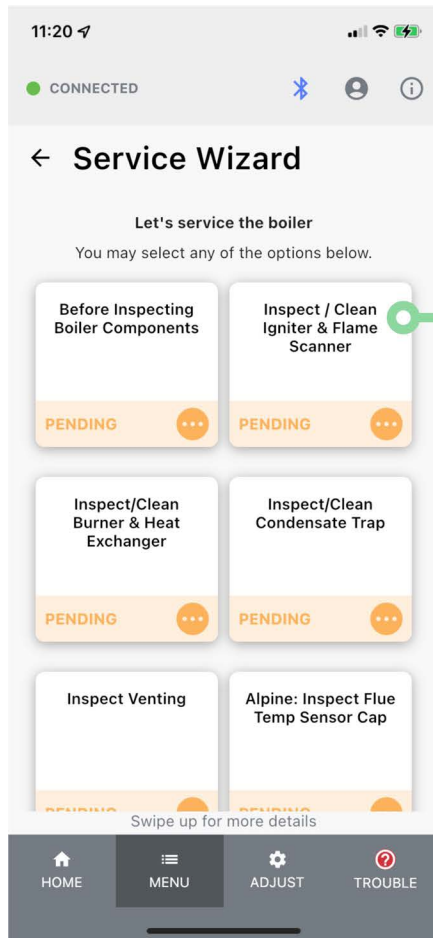
14

111680-03 - 10/23

# Service

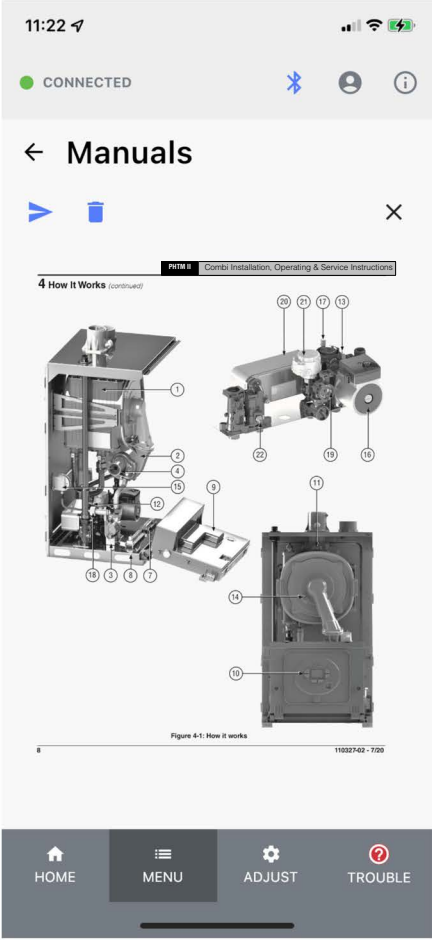
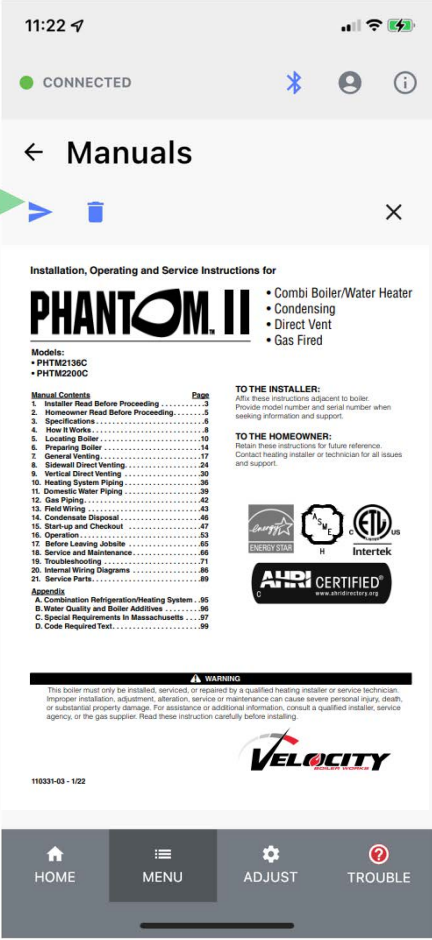
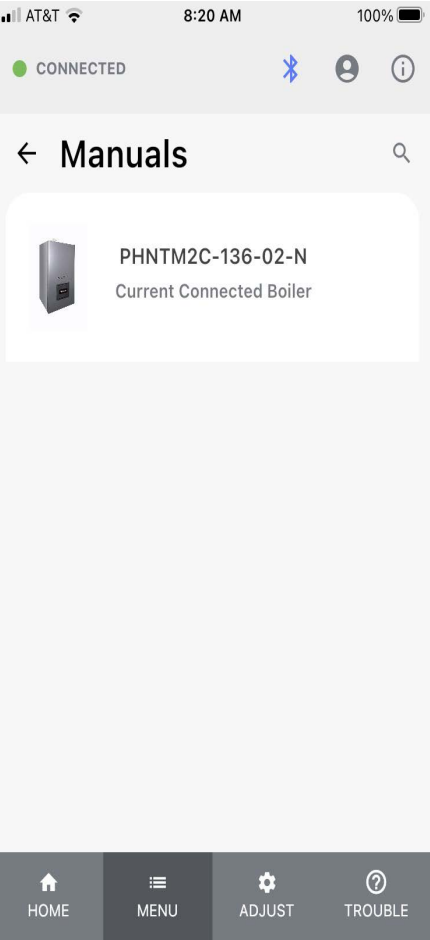
**Service Wizard** is provided to walk users through most common service tasks.

Service Wizard provides instructions to allow required actions to be as easy and successful completed.



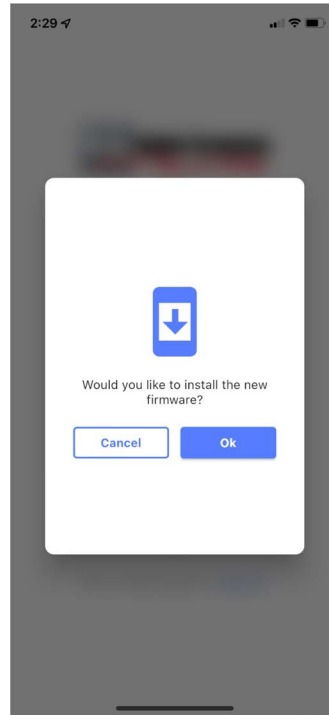


**Manuals** are provided to ensure the user always has complete and the latest information.  
Note: Download the manual to ensure it is available when there is no cell service and to enable zooming.



## Bluetooth Adaptor Update

When new Bluetooth Adaptor firmware versions are available, the user will be alerted with an option to download the new firmware. Select "Ok" and allow the firmware download to complete. After download is complete disconnect and then reconnect Bluetooth Adaptor power and close App and reopen once Bluetooth Adaptor LED is solid green.

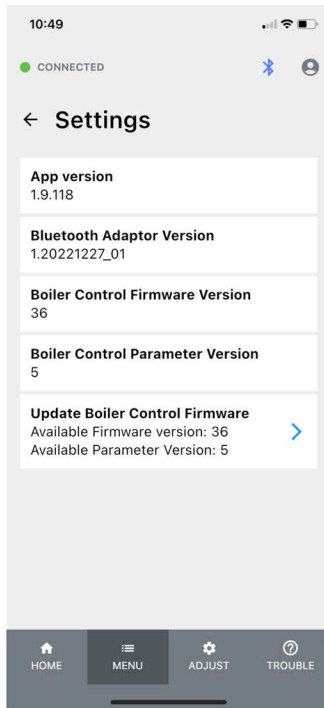


**New Bluetooth Adaptor Firmware Update Indication**

# Phantom Control Updates

The latest Phantom Controller firmware and default parameters are made available to the App. When necessary Phantom Controller Firmware or default parameters may be downloaded in the field.

Select Settings on the MENU tab

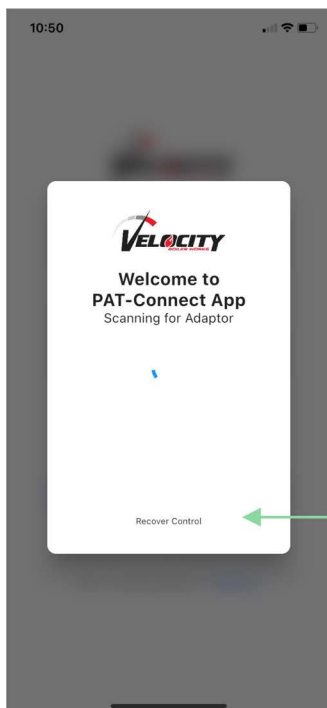
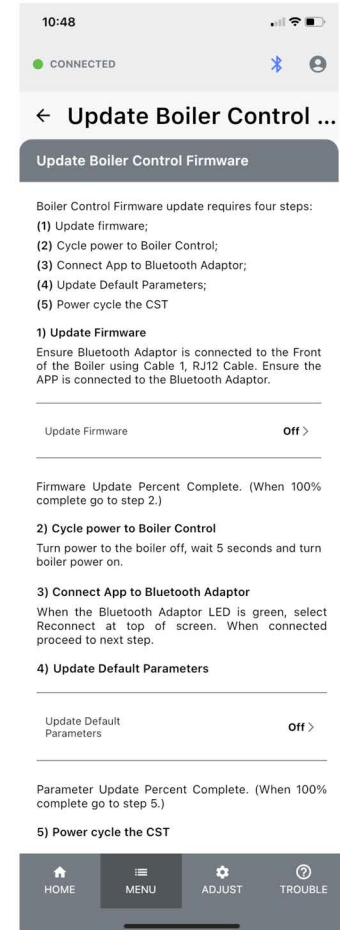


## Firmware and default parameter update

Use MENU to navigate to the Settings menu.

Only update the Boiler Control Firmware when the Available Firmware Version is higher.

Only update the Boiler Control Parameters when the Available Parameter Version is higher.



## Recover Control

In the unlikely event of a Firmware download failure (local display is off and Bluetooth Adaptor LED is Red), the User may select, "Recover Control" and navigate to the Update Boiler Control Firmware function and re-do the firmware load procedure.

# Appendix

## Specifications

### Power

24 VDC via DC Barrel Jack:

- Power supply: AC 100-240V, 50/60Hz input, DC 24V 0.3A output

24 VDC via RJ12:

- Power supply: DC 24V 0.04A input





24 VAC via RJ45:

- Power supply: AC TBD input



### Environmental and Regulatory:



- Model: PAT-Connect
- Hardware Version [HVIN]: E2
- Environmental protection: IP10 (Nema 1)
- Flammability: UL94-V0
- Working humidity range: 0-95% (non-condensing)
- Working temperature range: -50°F - 104°F (10°C to 40°C)

## Bluetooth Adaptor Blink Codes - Initial Power Up

LED		Description
	Off	No power connected
	Light Blue	Initializing
	Yellow	Device Firmware Upgrade (DFU) Mode is active (waiting for update file)
	Purple	DFU Mode is active (receiving update file)

## Bluetooth Adaptor Blink Codes - Running Mode

LED		Description (Shown in 1st 1/2 second)
<b>Modbus Connection between Boiler to Adaptor Status</b>		
	Green	Boiler to Adaptor Communication Detected
	Red	Boiler to Adaptor Communication NOT Detected

LED		Description (Shown in 2nd 1/2 second)
<b>Bluetooth Connection between Adaptor to Smart Device Status</b>		
	Blue	Bluetooth Connection between Adaptor to Smart Device
	Off	No Bluetooth Connection between Adaptor to Smart Device

For example: "Green-Blue" Modbus and Bluetooth communicating.

## Appendix (continued)

### FCC Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

## Appendix (continued)

### IC Statement

This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique

Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.

## Appendix (continued)

### Repair Parts

1. PAT-Connect Bluetooth Adaptor Kit-----Velocity P/N: 111668-01  
PAT-Connect Bluetooth Adaptor (Portable Tool, Connects PAT-Connect App and Portal to: , Phantom, Phantom II, Phantom Combi, Phantom II Combi, Phantom X, Raptor, Raptor Combi Shadow); Carry case, information card; CST Sage Controller J3 Terminals to RJ45 Interface Board (111640-01); Cable 1, RJ12 Straight Cable; Cable 2, RJ45 Split Cable; Cable 3, RJ45 Straight Cable.
2. Connected Service Tool Sage J3 Terminals to RJ45 Interface Board-----Velocity P/N: 111640-01  
Connected Service Tool Interface Board, used to connect Sage Controller J3 screw terminals to Bluetooth Adaptor or Remote Support System using an ethernet cable.
3. Cable 1, RJ12 Straight Cable-----Show Me Cables P/N: 15-302-003S  
Standard RJ12 Line Cord, 24AWG, stranded copper conductors, 6 conductors, straight through, PVC jacket, Silver, Standard Boot, 36-inch length.
4. Cable 2, RJ45 Split Cable-----Velocity P/N: 111662-01  
Custom cable has two RJ45 connections on one end and single RJ45 on opposite end. Used to connect Bluetooth Adaptor to Sage equipped boiler's Boiler to Boiler and Enviracom RJ45 connections, Black, Standard Boots, 24-inch length.
5. Cable 3, RJ45 Straight Cable-----Show Me Cables P/N: 530-03 BL  
Standard Cat5e Ethernet Patch Cable, 24AWG, stranded copper conductors, 8 conductors, straight through, PVC jacket, Blue, Standard Boot, 36-inch length.



## Appendix (continued)

### Troubleshooting Tips

Indication	Possible Cause	Corrective Action
App Will Not Accept New User Account	Cell signal not available.	App requires a cell signal to accept a new user profile. User can log in without cell signal after initial acceptance.
Bluetooth Adaptor LED is OFF	Cables not connected properly.	Sage Controller: Cable 2, connections to boiler are reverse. Switch RJ45 connections, see page 5.  Phantom II Controller: Cable 1 is not connected. Cable 1 is connected to the Bluetooth Adaptor center connection, should be to the right side connection, see page 5.
	Wrong Cable.	Cable 1, 2 and 3 must be "straight through" cables.
	Boiler is not powered.	Power up boiler.
Bluetooth Adaptor <b>LED is flashing Red</b>	Sage Control Fail to Connect.	Sage Slave Address is not set to 1, Panasonic Status screen should show "Boiler 1". If not, go to Panasonic display/Adjust Menu/Sequencer Slave and adjust Boiler Address to 1. Cycle power to Bluetooth adaptor.  Wiring to Boiler RJ45 boiler connection are disconnected. To fix this use: "CST Sage J3 Terminals to RJ45 Interface Board", PN: 111640-01, see page 5.
	Failed Cable or connection.	Check cables and cable connections. Replace cables if necessary.
Erratic number updates or bad data	Bad connection.	Reboot Bluetooth Adaptor and open App after Bluetooth Adaptor LED has turned green.
App will not connect	Bad connection.	Reboot Bluetooth Adaptor and open App after Bluetooth Adaptor LED has turned green.
	More than one (1) Bluetooth Adaptor is powered.	App can only connect to one Bluetooth Adaptor. When more than one (1) are available the App will connect to neither.
	Failed to close & reopen App after connection to different Bluetooth Adaptor.	When two Bluetooth Adaptors are on site, close App and reopen when connecting to next Bluetooth Adaptor.
App will not connect to Sage Controller	Sage Controller greater than 10 years old.	Sage controllers older than 2012 (revision 1967, 3212 and 3220) are not compatible with the App.
	Sage Controller with multiple boilers in a peer-to-peer network.	When connecting boilers arranged in Sage Controller equipped Boiler peer-to-peer network the Sequencer Master must be disabled. To keep the Sequence Master enabled, connect the CST directly to the Sage Controller using "CST Sage J3 Terminals to RJ45 Interface Board", PN: 111640-01, (see page 5) and MB1 terminals. Phantom Controller does not have this issue.