



FUTERA^{III}
FUTERA^{XLF}
FUTERA^{FUSION}

HeatNet[®] V3 Color Display Supplement

Color Display menus and descriptions for
firmware Version 3.x

This supplement applies only to version 3.x
firmware on version 3 control boards with a color
display. To replace firmware on an existing boiler,
contact the factory or website
<http://www.rbiwaterheaters.com> to obtain the
original firmware file

Also read and follow:

Futera HeatNet 3 Manual
Futera III Boiler manual or
Futera Fusion Boiler manual or
Futera XLF Boiler manual



WARNING

This manual is intended only for use by a qualified heating installer/technician. Read and follow this manual, all supplements and related instructional information provided with the boiler. Install, start and service the boiler only in the sequence and methods given in these instructions. Failure to do so can result in severe personal injury, death or substantial property damage.

Do not use the boiler during construction. Construction dust and particulate, particularly drywall dust, will cause contamination of the burner, resulting in possible severe personal injury, death or substantial property damage. The boiler can only be operated with a dust-free air supply. Follow the instruction manual procedures to duct air to the boiler air intake. If the boiler has been contaminated by operation with contaminated air, follow the instruction manual guidelines to clean, repair or replace the boiler if necessary.

Affix these instructions near to the boiler. Instruct the building owner to retain the instructions for future use by a qualified service technician, and to follow all guidelines in the User's Information Manual.

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications.

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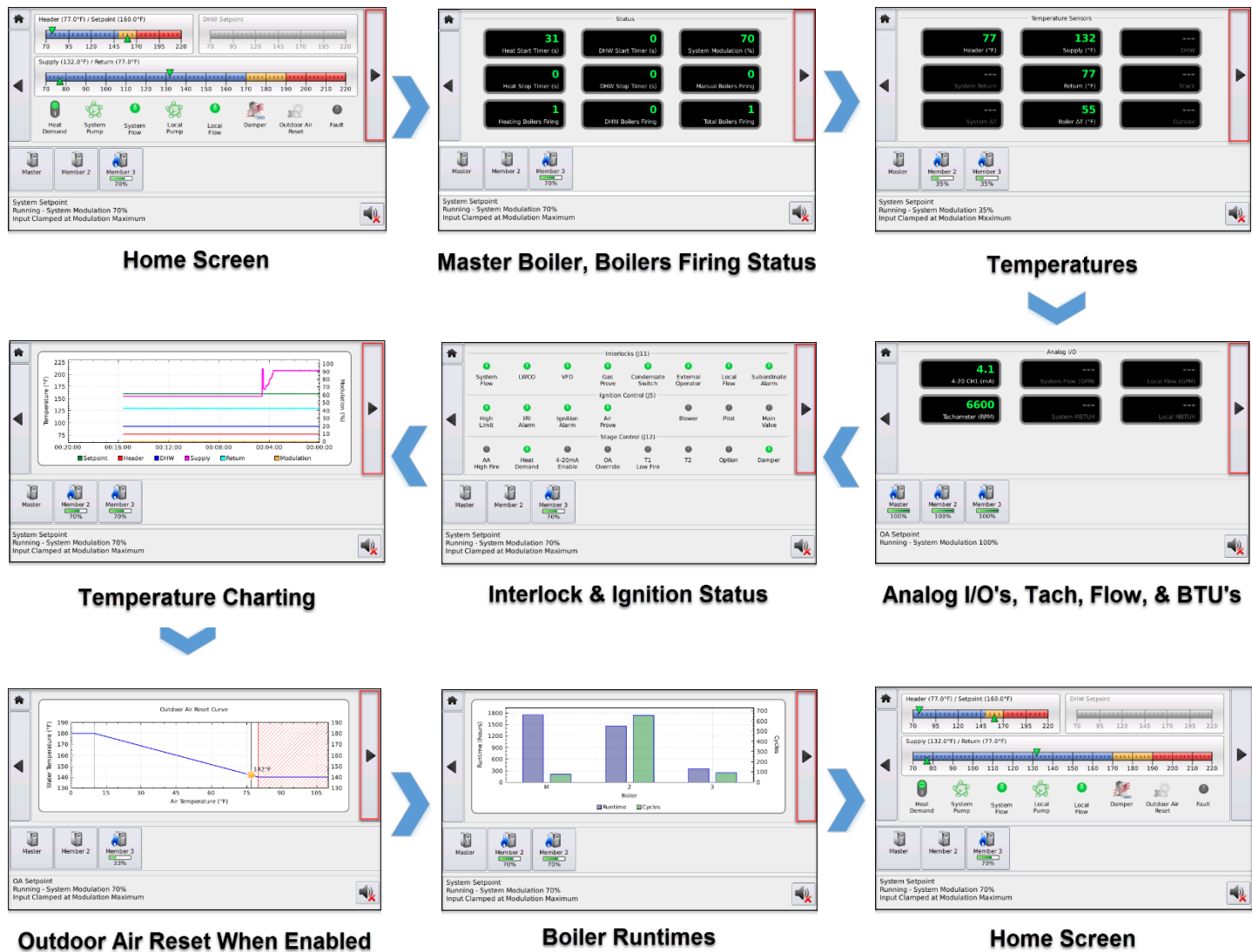
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Home Screen Navigation



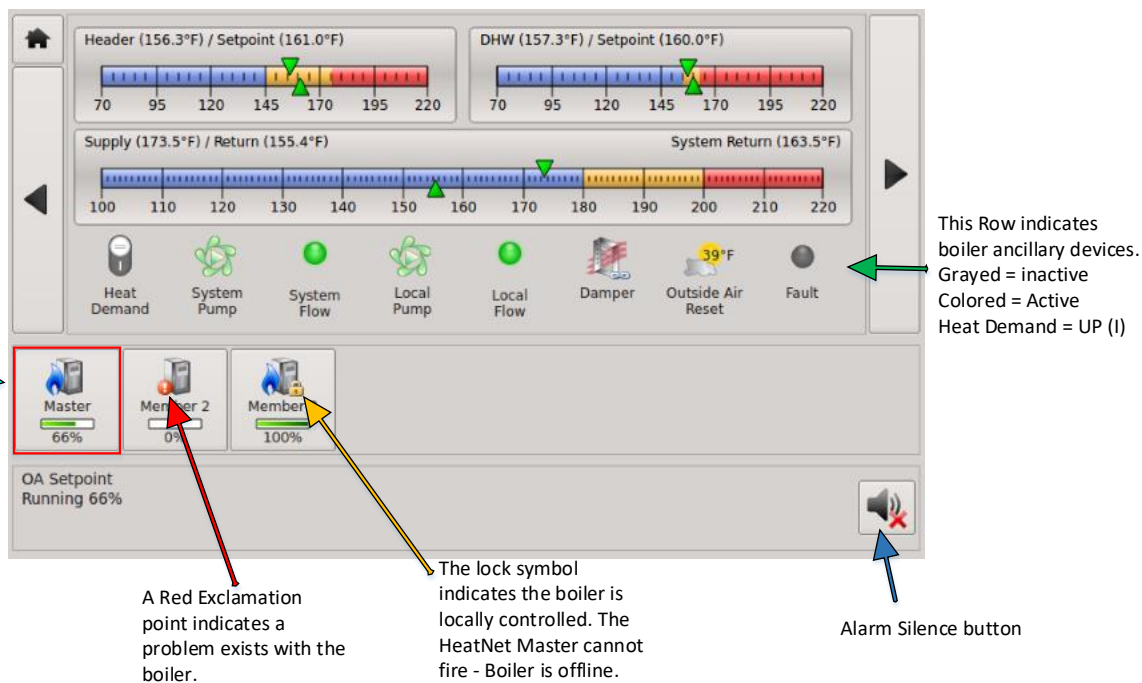
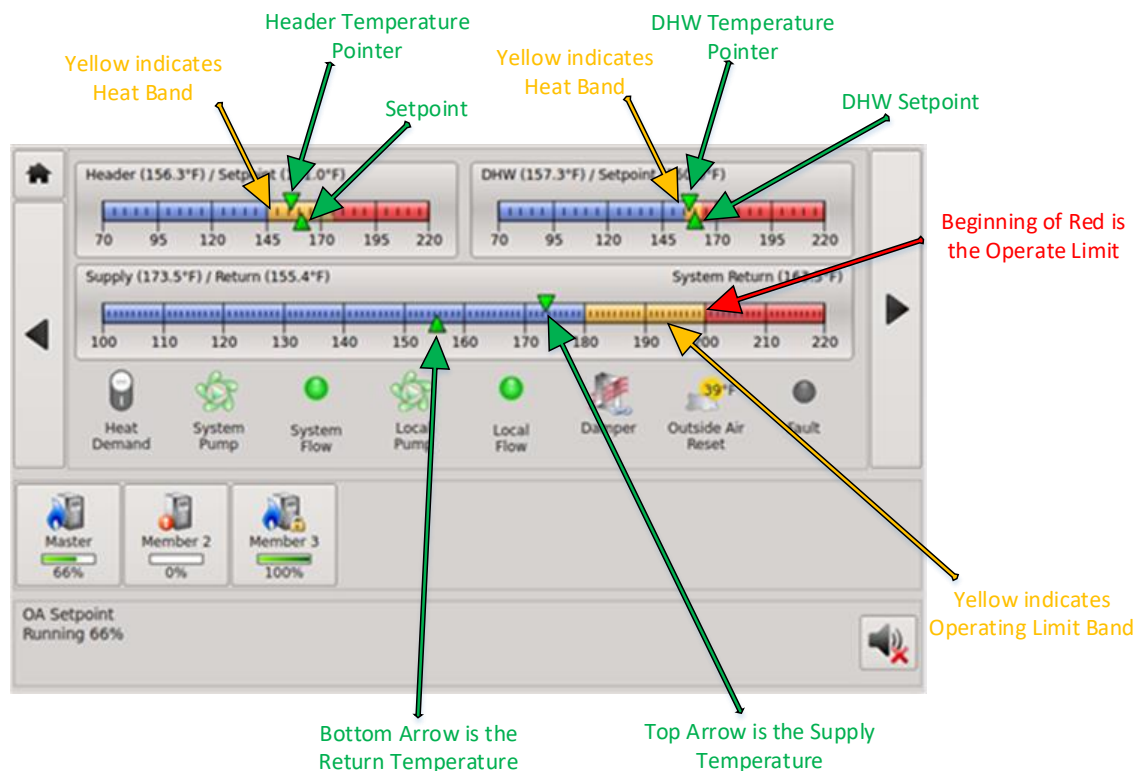
This diagram depicts the Home screen and subsequent screens when the right arrow button is pressed. Repeatedly pressing the right arrow button forms a ring of the different screens. These screens are used during normal operation of a boiler or boiler system.

Home Screen

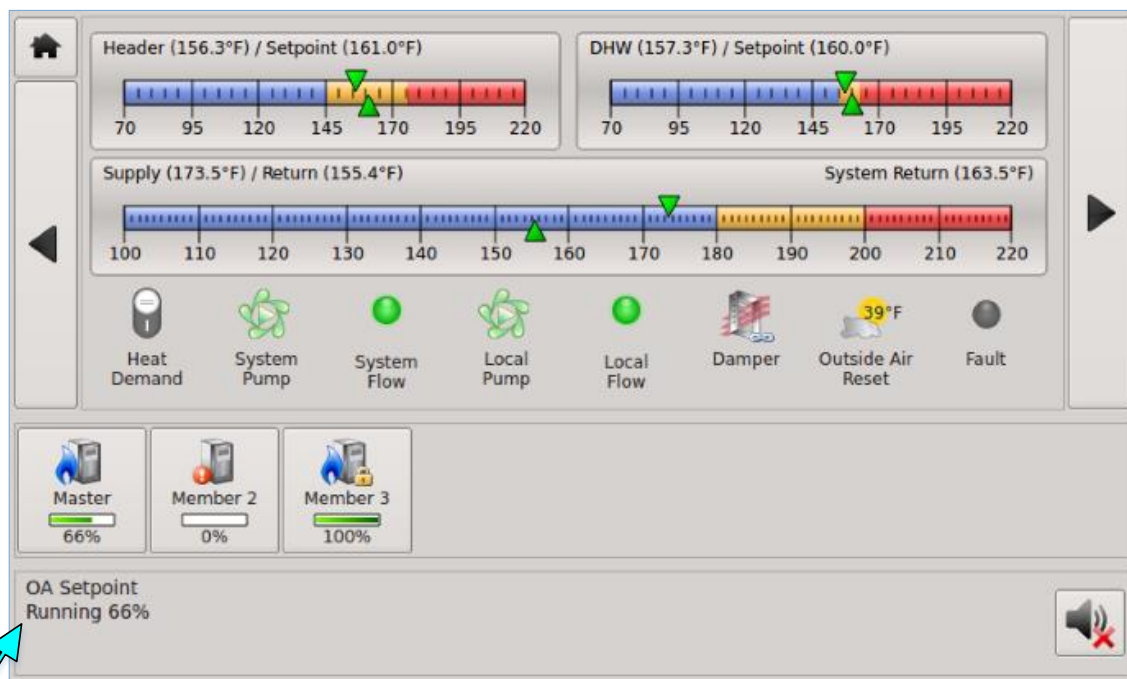
The Home screen is used to show the main temperatures in graphs along with some ancillary functions.



The Home Button in the upper left corner when pressed, will always enter the Home screen.



Home Screen Messages



Status Line 1: Setpoint Source – Heating Mode
 Status Line 2: Running Status
 Status Line 3: Any Fault Information

Heating Mode Messages

Control Signal	An analog control signal on 4-20mA (1) input is controlling fire rate.
DHW Tank	A DHW thermostat or sensor is being used to fire boiler in a DHW mode.
Failsafe	Boiler in Failsafe mode – No other Heating Demand may be present.
HeatNet	Call for Space Heat is controlled by HeatNet.
HeatNet DHW	Call for DHW Heat is controlled by HeatNet.
High Fire	High Fire AA is active or T1 and T2 Inputs are active.
T1	T1 Input is active – Low Fire rate
T2	T2 Input is active – Low Fire if T1 Input– High Fire if T1 active

Setpoint Source Messages

0-10V Setpoint	Settings are configured to allow a 0-10VDC signal to change setpoint.
4-20mA Setpoint	Settings are configured to allow a 4-20mA signal to change setpoint.
DHW Setpoint	The DHW sensor is controlling the setpoint for DHW heating.
Local Setpoint	Boiler is watching the Local Setpoint..
OA Setpoint	The Outside Air sensor is controlling the setpoint..
System DHW Setpoint	A Member boiler is being controlled by a HeatNet Master – Reference.
System Setpoint	Boiler is watching the System Setpoint from the HeatNet Master.

General Messages

Air Switch (Blower)	If the ignition control closes its BLOWER relay, and the control does not see the PILOT relay close within (2) minutes, this message will be displayed. This alarm protects the boiler from freeze ups being caused by a blower bringing in cold outside air with no fire.
Blower, RPM Fault	The Tach signal on J1 is present or is not present (depending on the Blower Type) when the blower starts it's pre-purge. This may be caused by the Boiler Type setting being improperly set to a VFD when an Ametek blower is present, or an Ametek blower being set when a VFD is present.
Blower, RPM High: (Ametek Blower)	If the signal from the HeatNet control board to the Ametek blower exceeds the factory limits, or the blower “runs away” (excessive speed), this message will be displayed. With this event, the HeatNet control will lockout the boiler and the boiler will require a manual reset to restart.
Blower Signal not Received, Retrying	The Boiler attempted to start by sending the J5 FLAME SAFE ALARM signal to the Ignition Control. The control then waited for the Blower signal from the Ignition Control and timed out. The Blow out switch (air box safety relief) may have opened.
Call For Service	When a start signal to the ignition control is sent and not received the H-Net control wait s 2 minutes. A retry start ignition sequence for the duration of the local pump post purge time will occur. During this time ,“ Blower Signal not Received, Retrying ” will be displayed. After (5) attempts the H-Net control will lock out.
Combustion Air Damper Fault	Caused when the damper is detected closed, but should be open . Input on J12B.7 & J12B.8.
DHW Heating	The boiler is performing DHW Heating.
Failsafe: HeatNet Communications Lost	The control has entered the Failsafe mode due to a loss of HeatNet communications from the Master.

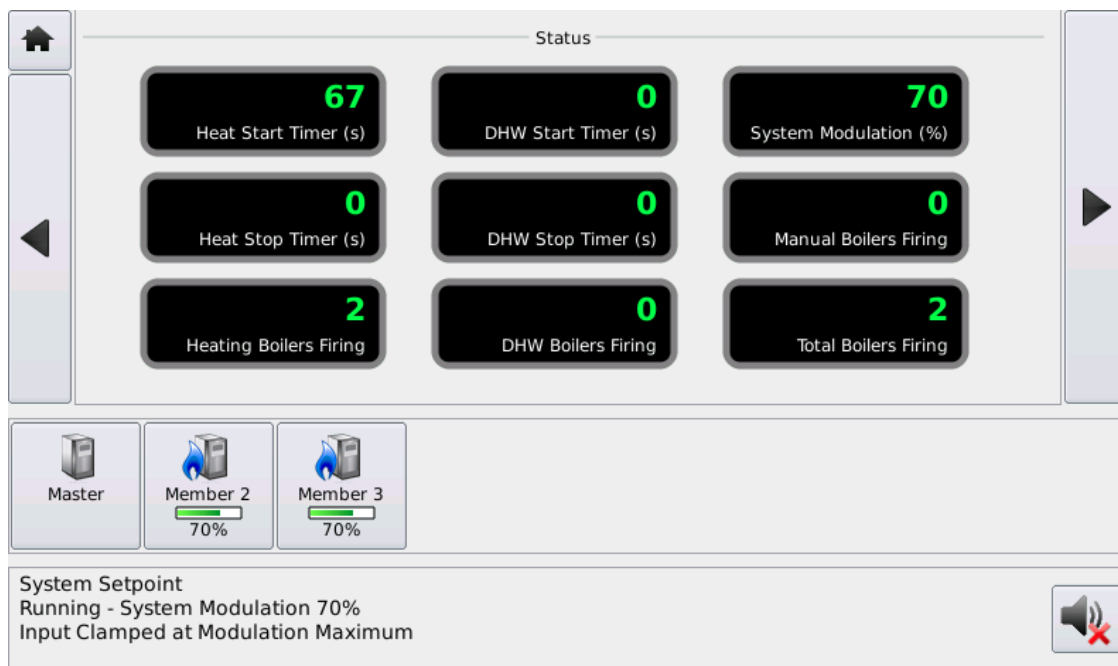
Failsafe: Low DHW Temperature	The boiler has entered Failsafe mode due to a low DHW temperature.
Failsafe: Low Header Temperature	The boiler has entered Failsafe mode due to a low Header temperature.
Failsafe: Low Return Temperature	The boiler has entered Failsafe mode due to a low Return temperature.
Failsafe: Low Supply Temperature	The boiler has entered Failsafe mode due to a low supply temperature..
Fault	A problem has occurred with boiler – Interlocks or firmware detected.
Fuel Change (Dual Fuel) is in Progress	If the boiler is configured for dual fuel – displays during a changeover.
Gas Pressure is too High or Low	If the GAS PR opens on J11A.7 & J11A.8 due to a gas pressure issue.
Heating	The system is in a heating mode, but none of the boilers are firing.
High/Low ΔT limited	Algorithm that looks at High ΔT or Low ΔT to protect boiler from thermal shock/stress. When this is displayed firing rate is limited.
Ignition Control Alarm	Occurs when the Ignition Control closes it alarm relay – Input on J5 FLAME SAFE ALARM. The ignition control alarm is displayed if the ignition control detects a fault. This could be a flame failure, air proving switch, or other fault associated with the ignition control. When this fault occurs, you will need to refer to the ignition control for the reason.
Input Clamped at Modulation Maximum	This clamp ensures that until all boilers are running, the input is limited to minimize over firing the system when new boilers are added. It also limits the boiler's input before servicing a request to go to high fire (preventing thermal shock).
Input Clamped for Protection (Operating Limit)	This clamp is active when the supply water temperature is in the Operating Limit Band (Yellow part of the Heating bar). It is used to limit the input of the boiler in order to minimize cycling off the Operating Limit.
Input is limited to ½ rate	The boiler is in a protection mode, High/Low Delta – firing rate limited.

Input is Reduced due to Stack Temperature	If a stack sensor is used and temp exceeds limits.
IRI Alarm	This is a 120VAC interlock used by the Gas Valve proving option. J5 Input VALVE ALARM.
Minimum off Time is Active	The Minimum Off Time has been set on the boiler. During this time the boiler has taken itself offline from the Master.
Multiple out of Sequence Interlocks Fault	The HeatNet control has detected an interlock fault and is trying to resolve the source. A wait period is in effect.
New Boiler Starting, Reducing Input	In a HeatNet system with the Adaptive Modulation selected, the boiler will reduce input on currently running boilers when starting a newly added boiler. This is to minimize adding too many BTUs delivered to the system.
No Local Flow	Interlock LOCAL WATER FLOW on J11B.5 & J11B.6. Once the HeatNet series boiler receives waits 10 seconds or more (adjustable) to prove flow. If there is no flow, the flow switch alarm will be set. Every 10 minutes the circulator pump relay will cycle ON for 10 seconds and then OFF for 10 seconds to try and establish flow..
No System Flow	The SYSTEM WTR FLOW interlock is open. J11A.1 & J11A.2. Once the HeatNet series boiler receives a call for heat, it closes the system circulator pump relay. It then waits 10 seconds or more to prove flow. If there is no flow, the flow switch alarm will be set. Every 10 minutes the circulator pump relay will cycle ON and then OFF for 10 seconds to try and establish flow.
Number of Boilers Limited due to Insufficient Flow	The GPM measured through a system flow meter, writing the GPM through communications port, or writing the # of boilers that can run does not meet flow requirements.
Open *** Sensor	The *** indicates the temperature sensor which opened. Sensors are: Outside, Supply, Return, Header, DHW, Stack, and System Return.
Pre-Purge	The Blower is exchanging the air in the combustion chamber per the Ignition control's pre-purge time.
Pilot	The boiler is at it's ignition phase in attempting to light the pilot.
Post Purge	A post purge of the blower is in effect.
Return Temperature is Low	Displayed when the Return Temperature may cause condensing (mainly in non-condensing boilers).

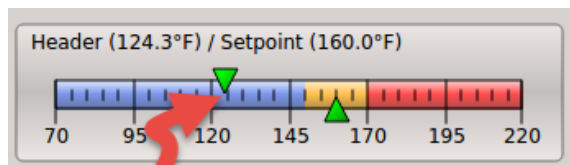
Running	The boiler is running and heating water. The Main Valve is open or this is the called for % of input.
Running 100%	The boiler is calling to run at 100% modulation.
Shorted *** Sensor	The *** indicates the temperature sensor which has shorted. *** Sensors are: Outside, Supply, Return, Header, DHW, Stack, and System Return.
Stack Temperature is High	If a 1k ohm platinum stack sensor is used, this message will be displayed . Caused by poor heat transfer in the exchanger.
Standby	The boiler has no call for heat. There is no Heat Demand Input.
Supply Water Temperature has Exceeded its High Limit Setting	The Mechanical High Limit on the Boiler has tripped. The high limit interlock breaks power to the ignition control and effectively removes any chance of the gas valve receiving power. The HeatNet series control remains powered to record and display the fault.. The interlock is located on J5, HIGH LIMIT. Ensure power is present on the input to the High Limit Control.
Supply Water Temperature has Exceeded the Operating Limit	When the supply water temperature exceeds the top of the Operating Limit Band and the Operating Limit. This is the Yellow Band portion of the temperature bar on the Home Screen.
Supply Water Temperature has Exceeded the Stat Operating Limit	The system is in a heating mode, but none of the Displays when a mechanical thermostat input is used and connected to EXT OPER J11B.3 & J11B.4 and opens.
User Interlock	This may be used as a custom interlock input on J11B.1 & J11B.2, but is currently used on FlexCore boilers as a float switch at the bottome of the heat exchanger.
UV Air Pressure Switch is Open	Input on J11B.7 & J11B.8 SCANNER AIR PRES. Boiler will still, though the site glass for the UV flame Scanner may become fogged during lower firing rates. This may lead to nuisance flame failures.
UV Shutdown Test	If the boiler runs continuously for a 24 hour period, the boiler will be cycled off and restarted to test the UV flame detector.
Variable Frequency Drive Alarm)	If a VFD is used to control blower speed , this message shows when the VFD's fault relay opens across J11A5 & J11A.6. The variable frequency drive, which controls non Ametek blowers, reports this fault. It may be caused by an over current, or an internal VFD fault that would cause it to shut down. If this is the case, check the fault indicators on the VFD.

Waiting for Damper to open	This is the Damper proving time when the damper relay closes until the Damper prove interlock closes on J12B.7 & J12B.8.
Waiting for Flow	This is the flow proving period that is in effect when starting the boiler. The pumps/valves would have been called on prior to this message. It's time may be extended using the flow prove time..
Waiting for Start Sequence	The boiler has begun to start and is waiting for the handshaking events to begin with the ignition control and the HeatNet control.
Warm Weather Shutdown in effect	The WWS temperature has been exceeded. The boiler system is in a sleeping state, but can be awoken with a DHW call. Once the outside air temperature falls below the WWS temperature, normal space heating will restart.
Warning	This message, unlike a Fault, still allows the boiler to function, but the issue should be serviced.
ΔT has Exceeded its Limit	The delta temperature across the boiler is too high
ΔT has Reached its Warning Limit	The ΔT WARNING has been selected instead of FAULT when the Delta T has been exceeded.

Master Boiler Status Screen

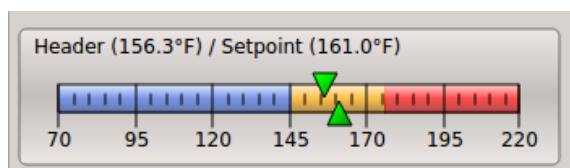


The above screen on the Master boiler displays the start and stop timers that are used to bring on boilers below and shed them above the heating band. When the Header temperature is below the band, the Heat Start Timer (Add Boiler Delay Timer) is started. Once it reaches 0, the next boiler will fire and be added to the Boilers firing display. This will continue until the Header temperature enters the Heating Band (Yellow) or all boilers have fired.



Heat Start Timer (ADD BOILER DELAY)

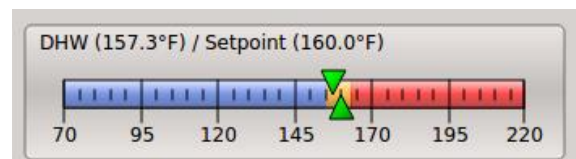
When the Header temperature is above the band (Yellow), the HEAT STOP TIMER (Shed Boiler Delay) is used to stop/shed boilers.



All boilers running are modulated to maintain Setpoint. Boilers are not added or shed while in the heating band (Yellow), except for when Predictive Start is set to YES.

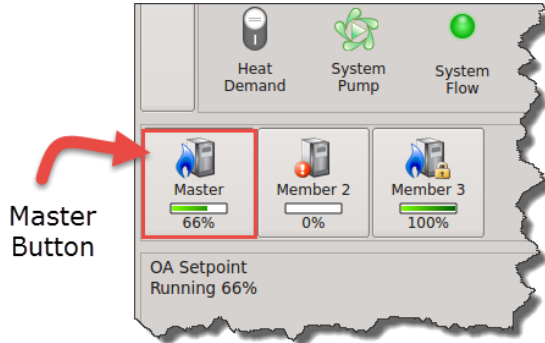
If Predictive Start is used, and when the temperature is falling fast through the band, a boiler will be started when in the band.

The same use applies to the DHW Start Timer (Add Boiler Delay) and DHW Stop Timer (Shed Boiler Delay) for DHW heating.

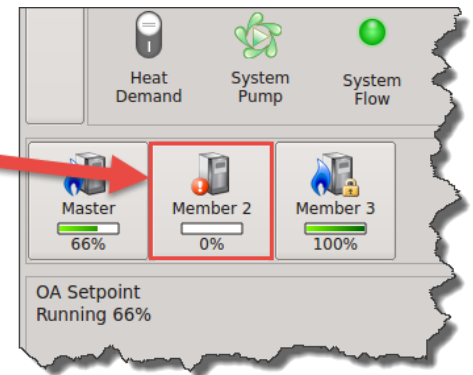


The remaining Status screens are informational and self-explanatory. These include: Temperature Sensors, Analog I/O, Interlocks - Ignition Signals – Stage Control inputs, Graphing, OA Curve, and Runtimes.

On the Home screen, information on each boiler can be accessed by pressing a boiler's button.



Member Button



Pressing The Master boiler's button will bring up the Master's information screen. In the bottom left corner there is the Settings button which will allow changes to the operational settings of the boiler. (See the Control Settings Menu section). Next to it is the Log File button. Pressing this button will allow viewing of the log file. See Log Entry section.



Pressing any of the Member buttons will bring up a Member's informational screen. Limited information is available for a Member from the Master boiler. Making settings changes and the viewing the log must be done on each Member boiler directly.

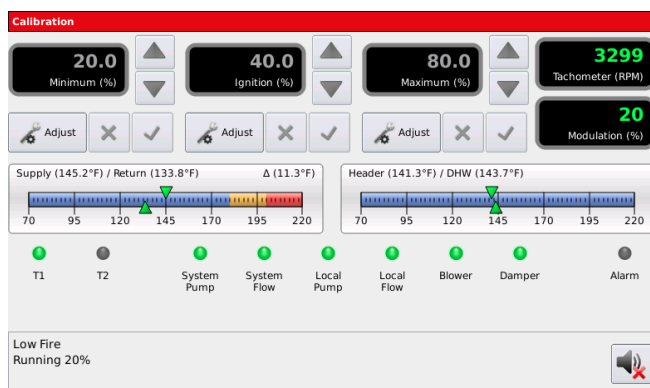


Calibration

NOTICE The calibration of the FlexCore CK Series boiler should only be performed by a licensed/Certified technician.

All calibration settings should be adjusted based on the boiler's parameters. See the Boiler Installation, Operation, and Maintenance manual (IOM).

To enter the calibration menus, place the S2 switch on the main control board to the CAL position. A reloading message will be displayed and then the calibrate screen.



Be sure to set this switch back to NORM when the calibration is complete, otherwise no external control inputs will work (except T1-T2), the display will always indicate CALIBRATE and some of the runtime temperatures will not be displayed.

The MINIMUM (%), MAXIMUM (%), and the IGNITION (%) settings can be adjusted from the calibration screen. The values can be changed while running **ONLY IN MINIMUM FIRE** (any, but only one, of the T inputs closed). Prior to ignition, the values may be changed, but the blower will not operate.

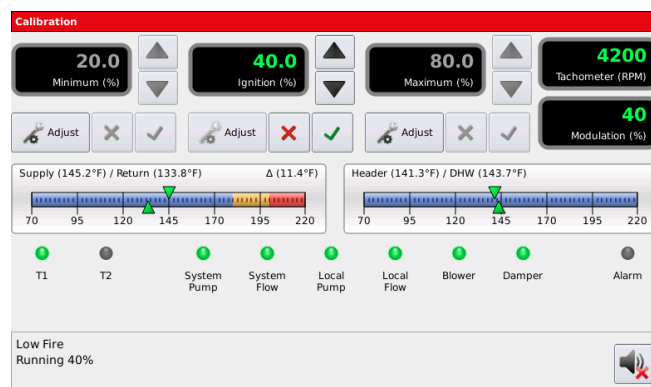
NOTICE The Low Fire Hold switch is located near the Calibration switch.

While in Standby (no call for heat on inputs), the minimum percent may be preset. To set the minimum rate while running, any (1), and only (1) of the (T) inputs must be closed in order to set the boiler to MINIMUM fire.

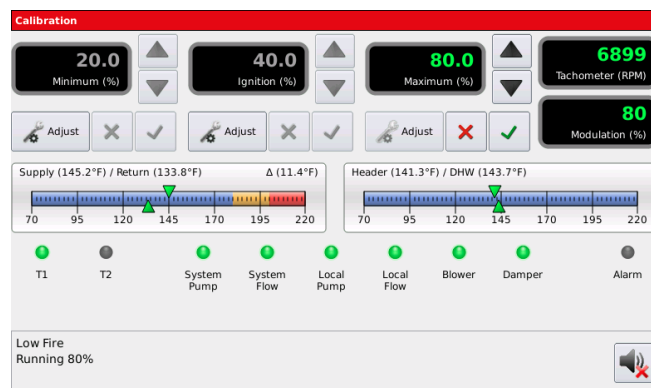
To adjust the MINIMUM (%) as shown in the display, press the Adjust button under the Minimum setting. The percentage value will turn green. Adjust the Minimum value to the desired setting using the arrow keys. The Minimum setting is clamped to its lowest rated setting and cannot be adjusted below this. Once you are done with this setting, press the 'X' key to throw out the setting or the check key to save.

NOTICE

All Faults must be cleared before adjustments can be made.



To adjust the IGNITION value as shown in the display, press the Adjust button under the IGNITION setting. The percentage value will turn green. The Blower speed will be set here to provide the rate for ignition. While in Standby (no call for heat on inputs), the Ignition percent may be preset, before firing the boiler. To set the ignition rate while running, any (1), and only (1) of the T inputs must be closed. Pressing the Adjust key here will cause the IGNITION setting to turn green and the boiler will ramp to the ignition setting. Adjust it using the arrow keys and then press the green check key to save the value. Press the 'X' key to discard the setting.



The MAXIMUM % value is used to set the maximum fire rate of the boiler. To adjust the Maximum fire rate of the boiler, press the Adjust button under the Maximum (%) value shown in the display. The percentage value will turn green. Then use the arrow keys to adjust the value up or down. Adjust it using the arrow keys and then press the green check key to save the value. Press the 'X' key to discard the setting.

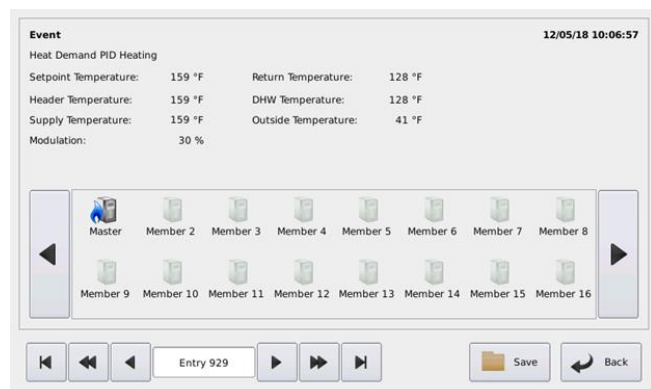
Log Entry



The Futera III/Fusion H-Net control contains a log that records the major activity (events) in the operation of the boiler. This activity includes interlock faults, boiler starting and stopping events, power cycles, misc. faults, and types of calls-for-heat (control inputs). Setting the time clock to an accurate time and date is very useful when events are recorded, since the control will time stamp each snapshot. If the system is configured to run with HeatNet, then only the Master boilers SYSTEM TIME needs to be entered. The Master will then set the time on all Member boilers.

The log is primarily used as a troubleshooting and diagnostic tool, but may be used as a performance tool to view run time cycles.

An event in time of the boiler's state is presented via multiple screens. Each screen event can be stepped through using the arrow keys.

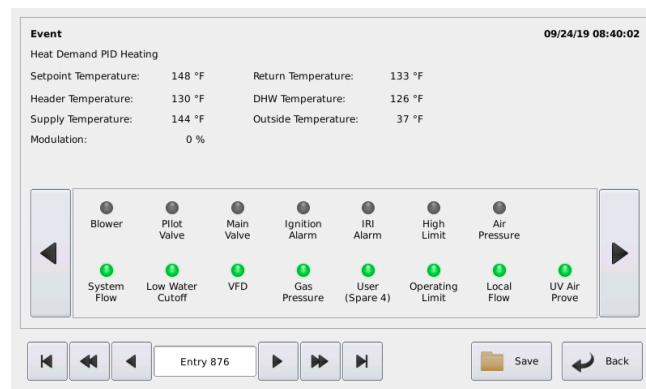


The top line, left corner indicates any condition that caused the event. This may be a fault (such as to indicate a sensor that has failed.) or general event as denoted by "Event". The top line, right corner displays the time and date the event occurred. In the bottom center of the command bar, the event # is displayed so that easy indexing can be done using the arrow keys. The second line from the top displays the type of heat demand for that event. The next few lines

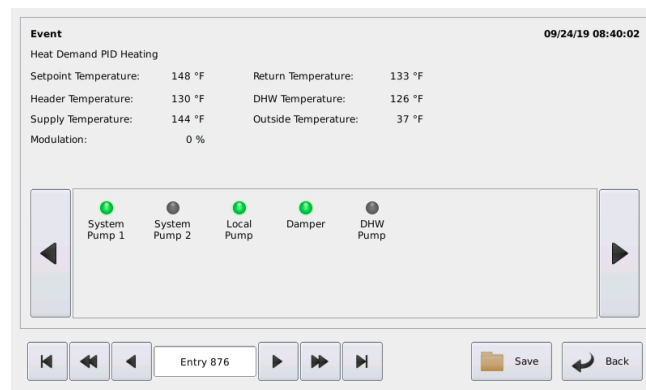
display the Setpoint, Return, Header, DHW, Supply and Outside temperatures. The last line displays the Modulation.

The Center middle annunciator shows icons of the boilers in the system/standalone with graphics indicating if they are firing.

The large arrow buttons on the left and right of the boiler icons allow the viewing of the control state.

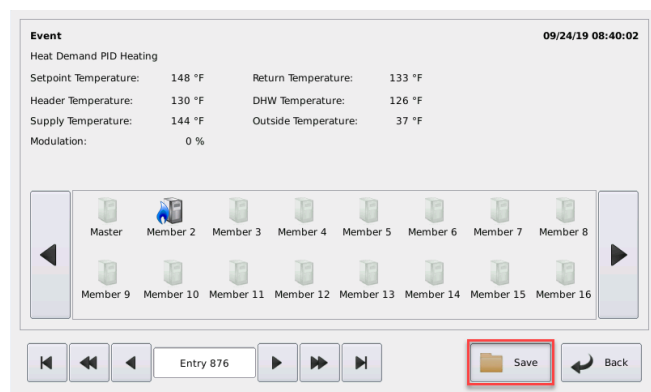


They are the Circulator Pump state, and the ignition sequence condition (Main Valve, Pilot Valve, Blower, and the Ignition alarm). There are also indicators for interlocks and auxiliary functions.

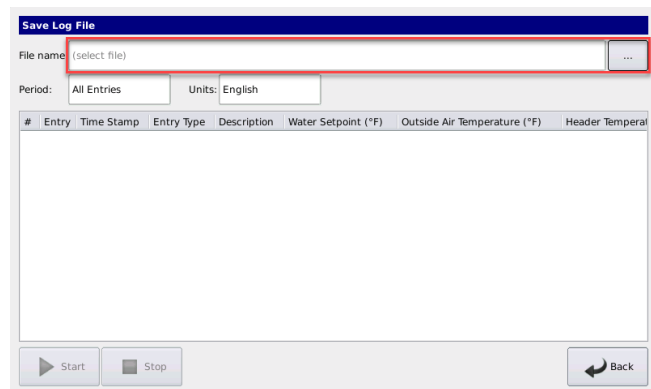


Saving the log file

The log can be saved to a USB drive so the data can be evaluated using a computer. The log file is saved using a csv format.

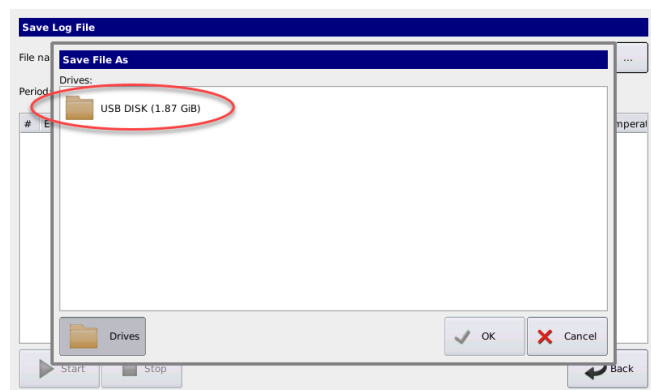


Pressing the **Save** button will bring up the Save Log File dialog.

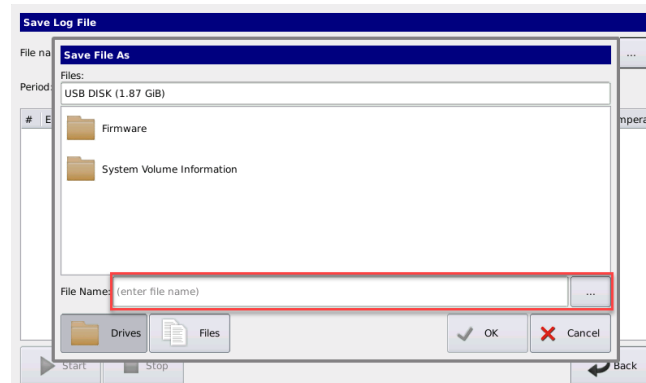


Insert a USB drive into the port of the boiler, and press “(select file) ...” in the File Name location

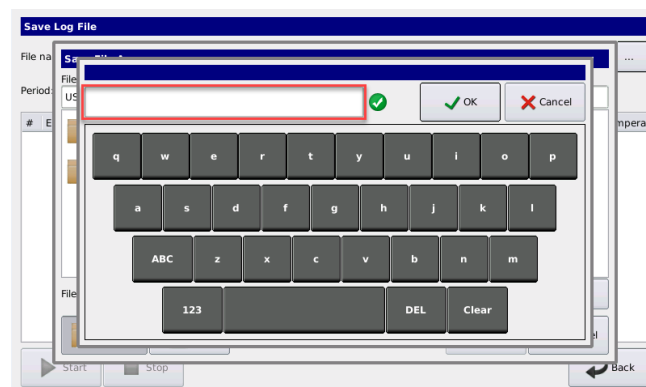
The USB drive will be displayed. Select the drive from the **Drives:** menu.



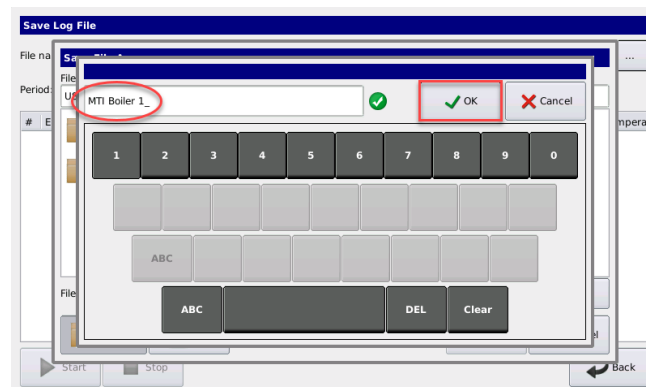
The files and folders on the USB will be displayed. You can choose a previously created folder or select the, “(enter file name) ...” to create a name for the log file.



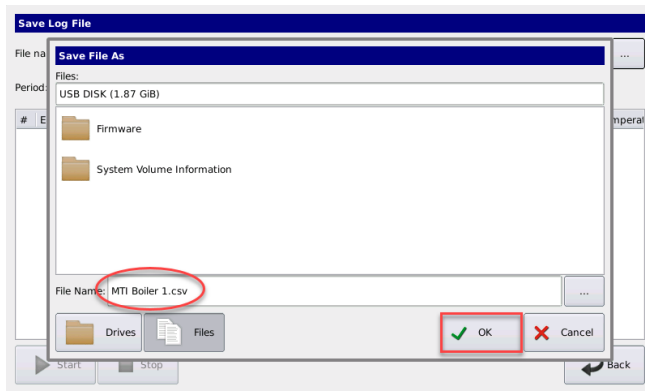
Type a file name using the keyboard.



After the name has been entered select the **OK** button.



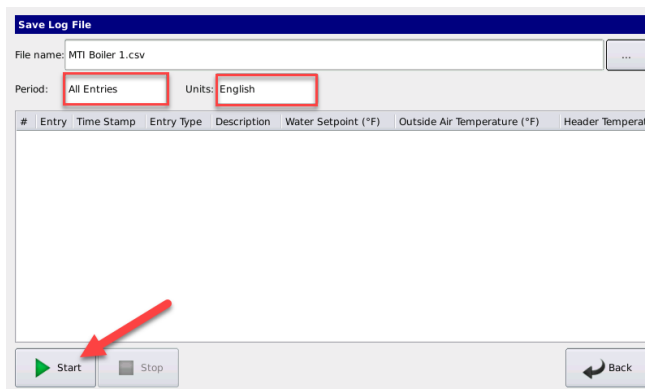
The **File Name** will be displayed, then select the **OK** button.



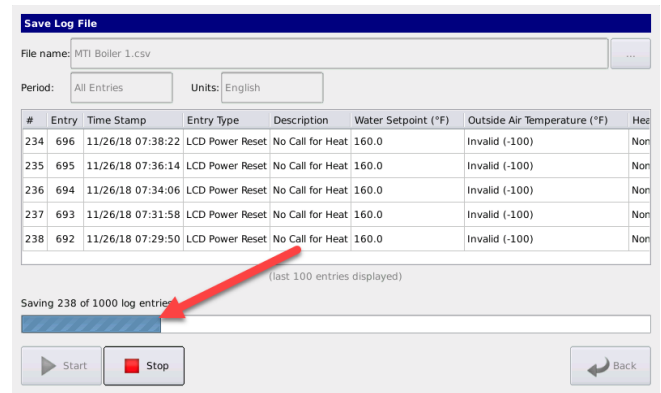
The **Period:** is defaulted at **All Entries**, the choices are **Custom Time**, **Custom Count**, **Last 24 Hours**, **Last 12 Hours**, **Last 8 Hours**, and **Last Hour**.

The **Units:** is defaulted at **English**, the choices are **English** or **Metric**.

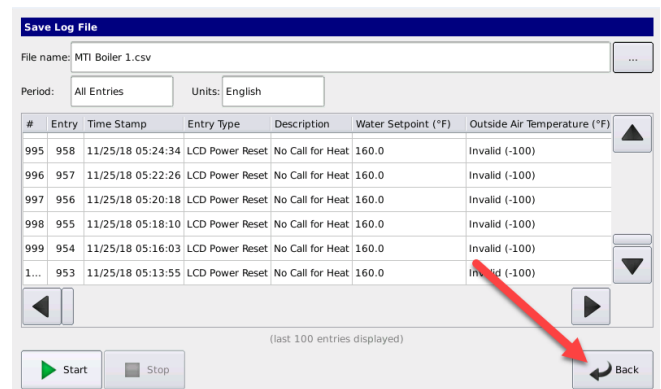
When the set-up is complete select the **Start** button.



While the log is being transferred to the USB drive a progress bar will display



Once the log file is complete select the **Back** button to return to the main screen. It is now OK to remove the USB Drive.



The log may also be viewed using HeatNet Pro or HeatNet Online.

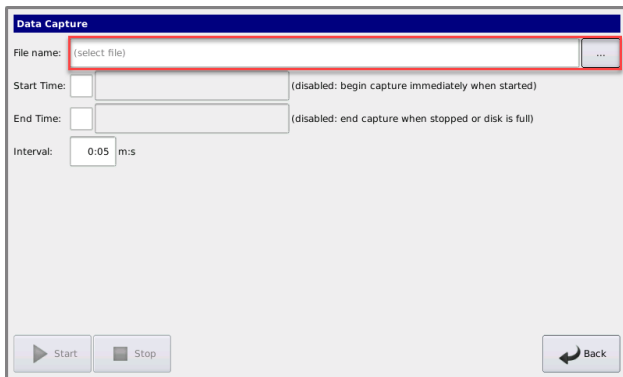
Data Capture

Operational data can be recorder at regular intervals using the data capture feature on the boiler information screen.

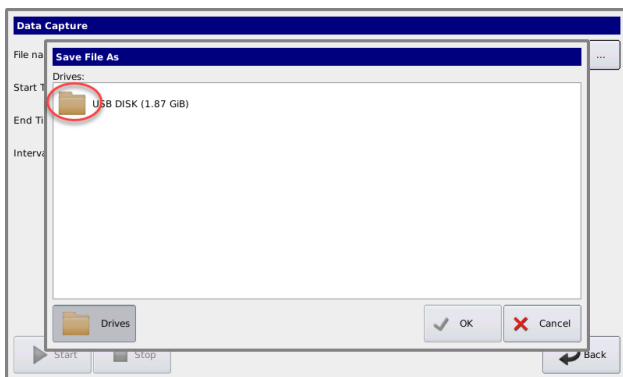
The data capture must be taken from the intended boiler. Insert a USB drive into the USB port of the boiler, and press the **Data Capture** button.



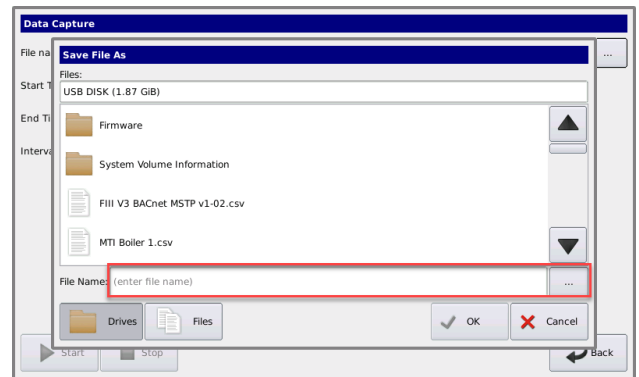
Press the **File Name** entry box, to select a location and name for file where the data will be saved. The fiel will be stored in a .csv format.



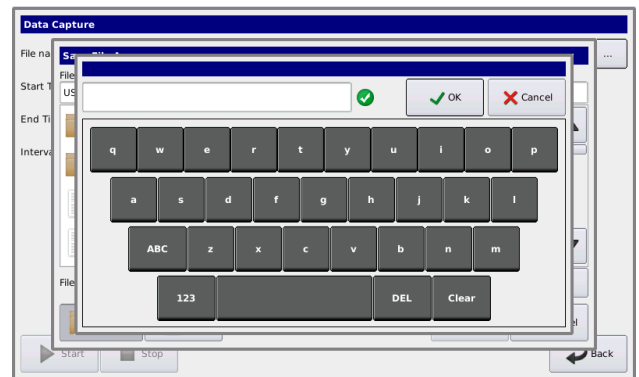
Select the **USB DISK** icon.



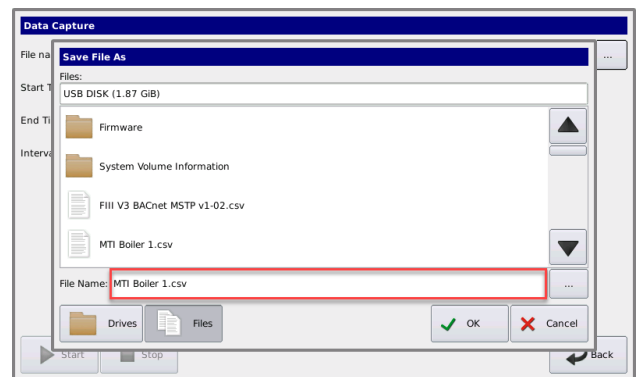
Select the **File Name** entry box.



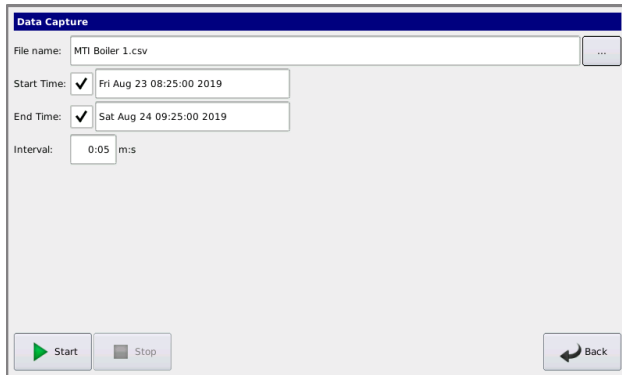
Type in the file name on the keyboard, then select the **OK** button.



Once the file name has been entered select the **OK** button.



The interval in which the capture will be taken can be selected from every 5 seconds to every 60 minutes. A start time and an end time can be specified if the data capture only needs to be taken during a specific period of time. Once the data capture criteria are entered, press the **Start** button. The data will now be sent to the file name on the USB drive.

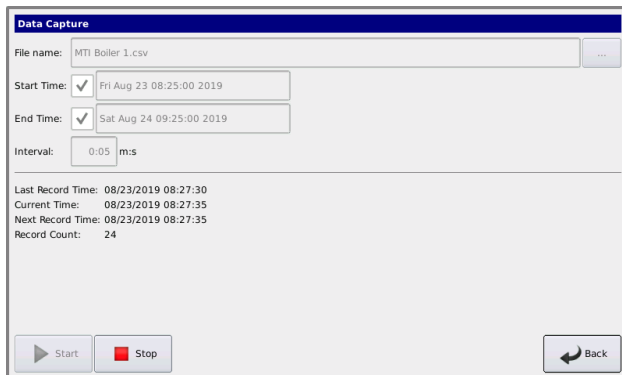


The screenshot shows the 'Data Capture' window with the following configuration:

- File name: MTI Boiler 1.csv
- Start Time: ☒ Fri Aug 23 08:25:00 2019
- End Time: ☒ Sat Aug 24 09:25:00 2019
- Interval: 0:05 m:s

At the bottom, there is a green 'Start' button, a gray 'Stop' button, and a 'Back' button with a circular arrow icon.

The data being recorded will be displayed as it is captured. When the data capture is complete the stop button will be gray and the start button will be green. The **Stop** button can be pressed to stop the capture prior to the end time. The data will be saved for that capture duration.



The screenshot shows the 'Data Capture' window with the same configuration as the previous image, but with additional real-time data displayed:

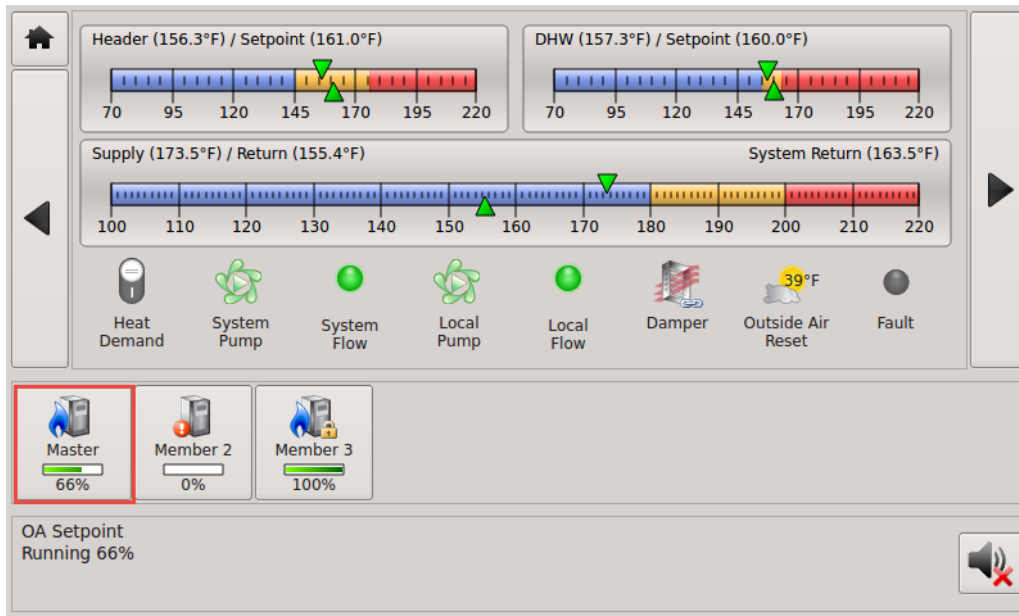
- Last Record Time: 08/23/2019 08:27:30
- Current Time: 08/23/2019 08:27:35
- Next Record Time: 08/23/2019 08:27:35
- Record Count: 24

The 'Start' button is now green, and the 'Stop' button is red. The 'Back' button remains the same.

The USB drive can be removed and the data can be viewed using a spreadsheet program on a computer.

Control Settings Menu

To enter the Settings menus the first boiler button must be selected. The button is highlighted by the red box.

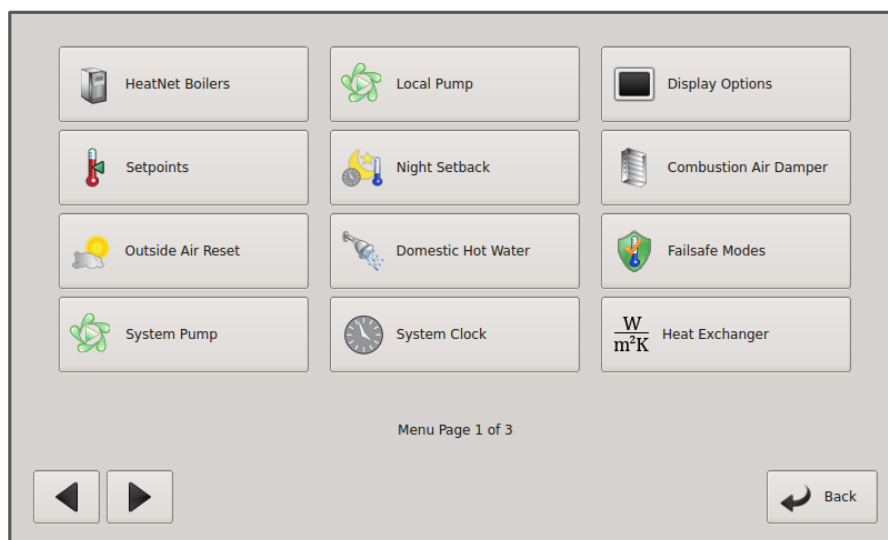



Next, press the Settings box as also illustrated by the red box.

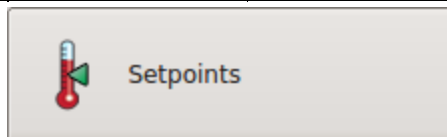


The Settings Menu Page 1 will then be displayed.

Control Settings Menu — Page 1



MENU	DEFAULT VALUE	RANGE	DESCRIPTION
 HeatNet Boilers			
# OF BOILERS	1	1-16	If operating as a member.
LEAD BOILER #	0	0-16	# of first boiler to run, determines the fire order in rotation. A 0 disables the Lead Boiler function. Firing Mode determines lead.
BOILER GRAPHIC	M	M-16	This Box displays the boilers auto detected by H-Net. While M is the Master boiler the numbers are the H-Net address of each boiler from 2–16.



LOCAL SETPT/ SYSTEM SETPOINT	160 °F	40-220 °F	Local setpoint used to maintain temperature of SETPT SOURCE System Setpoint is used by the Master.
HEAT BAND	20 °F	2 -50 °F	Differential temp around setpoint used to stage boiler(s) OFF/ON
OPERATE LIMIT	190 °F	45-230 °F	When running as a member, boiler shuts off when supply temperature reached. Boiler restarts at lower temp of OP LIM BAND or 10F whichever is lower
OPERATE LIMIT BAND	5 °F	1-50 °F	Limits external input % when in (OP LIM - OP LIM BAND)
SETPT SOURCE	AUTO	AUTO 4-20 mA	AUTO = Local/ System/ WWS Setpoint is used 4-20 mA input is mapped to a setpoint.



Outdoor Air Reset

WARM WEATHER SD	ON	ON/OFF	If set to YES, the boiler /system shuts down when the temperature exceeds the WWS SETPOINT.
WWS SETPOINT	68 °F	40 – 100 °F	Temperature at which boiler shuts down, operation is below this. If boiler is running using either OA RESET or WWS and the OR OVR input is closed the OA RESET slope is overridden and runs at local setpoint until OR OVR input opens.
OA RESET	OFF		Outdoor reset ratio (boiler water temp/outside air temp).
WATER TEMP AT HIGH OA TEMP	140 °F 70 °F	60 – 190 °F 50 – 90 °F	Boiler water temp setpoint when OA temp is at HIGH OATEMP These four setpoints determine the OA reset slope.
WATER TEMP AT LOW OA TEMP	180 °F 10 °F	70 – 220 °F -35 – 40 °F	Header/Supply setpoint when OA Temp is at LOW OA TEMP



System Pump

SYSTEM PUMPS	1	1 or 2	The number of system pumps connected.
POST PRGE TIME	5 Minutes	2 – 60 Minutes	Time in minutes to keep system circ. pump on after boiler stops
ROTATION:	NONE	NONE SYSTEM HOURS PUMP HOURS	
ROTATE TIME	240 HRS	1-1000 HRS	If ROTATION is set to SYS HRS, ROTATE TIME is used to switch pumps when this time expires. This time is measured against the actual time the system pump is enabled. This would include a post purge time. If ROTATION is set to PUMP HRS, ROTATE TIME is used to switch pumps when the pump's time difference is greater than ROTATE TIME. Whichever pump has the least time and is at least below the other (pump's time - ROTATE TIME) will switch to the enabled state. This selection is used to equalize run time on the pumps.
SUMMER PUMP JOG	OFF	ON/OFF MON-SUN	Used with Outdoor Reset, Jogs the local and system pump(s) for POST PRGE time when system is in summer shutdown. Jog once a week @ 12:00 AM. The menu item OVR ENAB IN WWS and ALWAYS ENABLED must be set to OFF for the jog function to work,
ZERO RUNTIME	PUMP1	PUMP1- PUMP2	This menu allows the clearing of a pump's runtime counter. Discretion is advised in clearing only one pump's hours after replacement and then using ROTATION set to PUMP HRS. This would cause the pump whose runtime was cleared to run until it's time exceeded the other older pump.
PUMP1 TIME		0-999999 Hours	Indicates how many hours the HeatNet control has accumulated on pump 1.
PUMP2 TIME		0-999999 Hours	Indicates how many hours the HeatNet control has accumulated on pump 2.
ALWAYS ENABLED	OFF	ON/OFF	ON = Pump never shuts off. Used when there is only 1 system pump in the system.

OVERRIDE ENABLED IN WARM WEATHER SHUTDOWN	OFF	ON/OFF	Priority mode for the system pump while in Warm Weather Shutdown. ON: The system pump is allowed to run in WWS when the OR OVR override input is closed. When set to OFF, the system pump will not come on while in WWS with the OR OVR override input closed. Enabling this feature disables the SUMMER PUMP JOG.
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Local Pump

DELTA TEMPERATURE ENABLED	OFF		ON: Use Delta temperature to shut pump off when temperature across boiler is less than DELTA TEMP setting.
DELTA TEMPERATURE	10 °F	2 – 50 °F	
POST PURGE TIME	2 minutes	1-60 Minutes	Time in minutes to keep local circ. pump on after boiler stops
ALWAYS ENABLED	OFF		Pump never shuts off.
LOCAL PUMP VFD	OFF	ON/OFF	ON: Outputs a 0-10VDC or 4-20 mA signal from J4 pins 1 & 5 that is proportional to the fire rate of the boiler. Connect to a VFD controlling a Local pump.
FLOW PROVE	10 Seconds	10-240 Seconds	This is an adjustable flow proving time to allow slower valves to open before proving flow.
MASTER PUMP/VALVE REMAINS ON	OFF	ON/OFF	ON: The Master boiler will keep its pump/valve on when no boilers are running. Prevents deadheading the system flow.



Night Setback

ENTRY	1	1 – 4	Four setbacks (TABBED) to adjust setpoint during a time period
ENABLE	OFF		Enable or disable the use of this setback
SETBACK	20 °F	0 – 50 °F	Temporarily subtracts this temp from the setpoint
START DAY	MON		Day of the week to begin setback or a day range
START TIME	12:00AM		Time to begin setback
END DAY	MON		Day of the week to end the setback or a day range
END TIME	12:00AM		Time of the day to end the setback



Display Options

ENGLISH	° F		Fahrenheit scale, English is default
	GPM		
METRIC	° C		
	LPM		



Combustion Air Damper

COMBUST AIR DAMPER			
TYPE	LINKED/ COMMON	LINKED/Common INDEPENDENT	The LINKED/Common setting allows one common damper to be used and controlled by the Master Boiler. All Member boilers must have their damper prove inputs wired as per Error! Reference source not found., Error! Reference source not found., page Error! Bookmark not defined. Also see Section: <i>Optional Features: Auxiliary Function Options</i> INDEPENDENT: Individual dampers are in controlled by their respective boiler.
IN USE?	YES	YES/NO	If set to YES, then OUTPUT RELAY K5 can be used to control a combustion air damper. The Master can control a common system damper or an individual damper. Members control their respective damper independent of the Master. Relay K5 is used to enable the combustion air damper. See Error! Reference source not found., Error! Reference source not found., page Error! Bookmark not defined. Needs to Prove the damper is open.
INPUT:	J12B.7 DAMPER		The damper prove input is dedicated to connect at J12B terminals 7 and 8. If using a common damper refer to the common damper wiring diagram.
PROOF TIME	2:00	0 – 4 Minutes	This is the proving time in minutes for the combustion air damper prove switch. It is sensed at J12B Pin 7. If the damper faults, a retry will occur every 10 minutes in attempt to open the damper. When using J12B in a common damper configuration, wiring is done beginning with the Master boiler. J12B Pins 7 & 8 are connected to the prove switch of the combustion damper. Pin 8 is supplying 24 VAC and pin 7 is the sense input. A second wire is connected to J12B pin 7 of the Master and the other end connected to the first member boilers J12B pin 7. If another member boiler is present, connect another wire to the J12B Pin 7 terminal of the first member and the other end to the second member boiler J12B pin 7. Continue this method for each additional boiler.



Failsafe Modes

RUN IN LOCAL IF: H-NET COMMUNICATIONS LOST	OFF	ON/OFF	If this entry is set to ON and the Member boiler does not see any communications coming from the Master boiler, this boiler will run in LOCAL. The boiler will continue to run in LOCAL until communications are re-established or this entry is set to OFF.
LOW TEMPERATURE SENSOR	NONE	SUPPLY, HEADER, RETURN, NONE	This entry may be set to one of the temperature sensors: SUPPLY, HEADER, RETURN, or turned OFF (default). If this entry is set to a sensor and the temperature falls below TEMP, the boiler will automatically start and run the water temperature up to the LOCAL Setpoint and then shut OFF.
TEMP < 40F	40 °F	35-200 °F	This is the temperature that the selected sensor must fall below for the boiler to start.

$\frac{W}{m^2K}$ Heat Exchanger


ALARM TYPE	WARNING	FAULT, WARNING	<p>FAULT will stop the boiler when the Delta T has exceeded its setting.</p> <p>WARNING will allow the boiler to continue running, but produce the Warning message.</p>
EXCHANGER DELTA T	40 °F	Per Boiler	This is the maximum differential temperature the heat exchanger can see before the LIMIT RATE feature is activated, and a log entry is made.
LIM TO HALF RATE	YES	YES/NO	<p>Limit to Half Rate: When set to YES, and the maximum differential temperature (delta T) has been exceeded, the fire rate called for is cut in half. In other words: if we are calling for 80% modulation and have exceeded the delta T, the boiler will only fire at 40%. The delta T needs to drop 10F below the maximum delta T to reset this limit. The message “½ INPUT” will be displayed on a member boiler and a Master Boiler will display the Modulation % for the system even though it is running at ½ of this rate. This method helps protect the heat exchanger from damage due to excessive delta T's. If this Master boiler is running</p>
SEND RETURN	RETURN	RETURN, SYSTEM RETURN	<p>This setting is used by the Master boiler to select which Return sensor temperature to send to all Member boilers. The Return temperature will then be used by the Member boilers (usually non-condensing) to determine if they can be called by the Master to run.</p> <p>If a System Return sensor is available on the Master, set this setting to SYS RET. If only a Return sensor is available, set to RETURN.</p>
TEMPERATURE DISAB	OFF	SYSTEM RETURN, RETURN, OFF	<p>This setting is used by a Member boiler (primarily a non-condensing type) to determine which return sensor to look at when determining if it is safe to fire. Its purpose is to keep non-condensing boilers from firing in a condensing mode.</p> <p>SYS RET the boiler will use the Return temperature sent from the MASTER boiler.</p> <p>RETURN the boiler will use its own Return sensor. If it is set to OFF, then this feature will not be used.</p> <p>If a sensor is selected, then the Boiler will determine if the Return sensor's temperature is below the TEMP< XXX setting in the following menu. If the Return temperature is lower, the boiler will take itself offline from the Master. Informing the Master that it can't run. The message “blr offline” will be displayed in the Status screen.</p>
TEMP<140F	140	135 – 200 °F	Setting determines where the TEMP DISAB return sensor's threshold temperature disables the boiler from firing.
EXTENDED POST PURGE TIME:	0 Seconds	0-600 Seconds	<p>This time may be used to remove condensation that is still present on the heat exchanger after the boiler has finished running. The time may be adjusted to 600 seconds (10 minutes). Unlike the 10 second fixed post purge time the extended post purge time may be interrupted by a call for heat.</p> <p>If the extended post purge is active, an “*” will be displayed next to “STANBY *”. This indicates that the boiler is still ready to run, but is completing an extended post purge. As always, the STATUS screen will display the meaning of the “*”. In this case: EXTEND PP.</p>



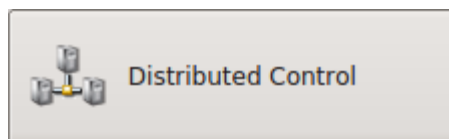
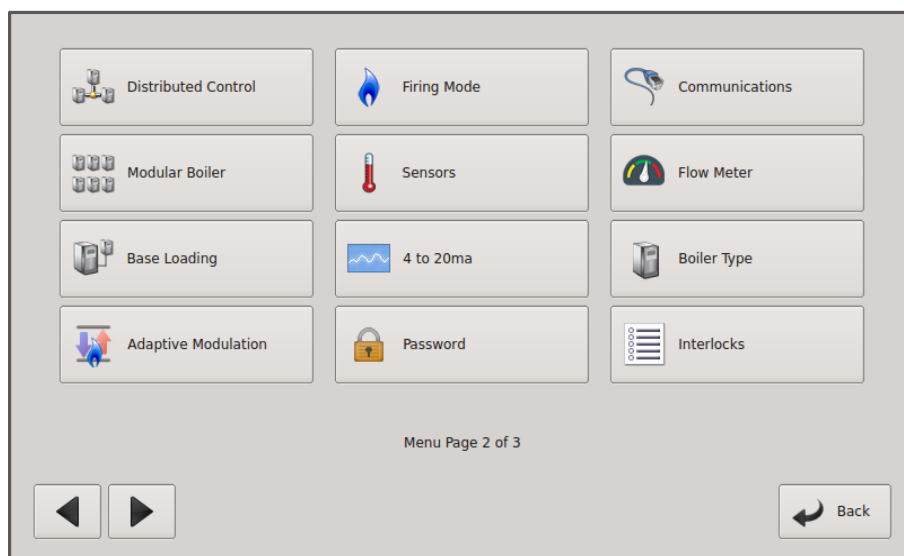
Domestic Hot Water

BOILER MODE	AUTO	AUTO, LOCAL, COMBINATION	<p>Setting this value to LOCAL or COMBINATION enables the DHW PID. Setting this value to AUTO disables the DHW PID.</p> <p>LOCAL allows the boiler to run in DHW locally off of its own sensor or thermostat input. The boiler could be configured to run as a space heating boiler that is controlled by a Master. It would also monitor a tank or DHW call and disconnect from the Master to provide local DHW heat.</p> <p>COMBINATION allows the boiler to be configured to run as a space heating boiler and a DHW boiler that is controlled by a Master. This would use both the space heating PID and the DHW PID to simultaneously control space heating and DHW heating.</p> <p>NO, turns off the DHW PID, but still allows control of the DHW pump and DHW setpoint for backwards compatibility.</p> <p>*Note: If the System is configured to use the OR OVR input to override the heating setpoint with the DHW setpoint, the DHW PID is not used. Since this method does not use the DHW PID, the DHW BOILER setting should be set to NO. The DHW SETPOINT, POST PURGE, LOCAL PUMP OFF, LOCAL DELAY, and PURGE TO THE: may need to be set if this method is used. This method does allow configuring the LOCAL and DHW pumps.</p>
SETPOINT	160 °F	40 – 200 °F	Setpoint that the boiler/system will target when a call for DHW.
LOWER BAND	5 °F	1 – 30 °F	DHW SETPOINT – LOWER DHW DIFF: if the DHW water temperature is less than this temperature, the Boiler/System will enter DHW Heating mode if DHW BOILER? is set to LOCAL or MIXED or COMBINATION.
UPPER BAND	3 °F	1 – 30 °F	DHW SETPOINT + UPPER DHW DIFF: if the DHW water temperature is greater than this temperature, the Boiler/System will begin shutting off DHW boilers if the DHW BOILER? is set to LOCAL or COMBINATION.
PUMP PRIORITY	NO		If the DHW PRIORITY is set to YES, then when there is a call for DHW, the system pump shuts off. If NO, the system pump stays on.
POST PURGE	120 Seconds	5-600 Seconds	This is the time that the DHW relay remains on after the DHW call ends.
USE SENSOR	NO		If this entry is set to YES, the DHW 10k Sensor is looked to for controlling DHW water temperature. If set to NO, A thermostat is used.
SHARING	CYCLE	OFF, NO CYCLE, CYCLE	<p>NO CYCLE allows the boiler to perform as a space or DHW heating boiler. DHW always has priority and will override (steal) a space heating boiler that is running when none are available to perform DHW heating. When this happens, the boiler will not shut down, but keep running during the change from space heating to DHW (Hot Swap). Once the DHW cycle completes, the boiler will shut down and wait to be called for space heating again.</p> <p>CYCLE allows the boiler to perform as a space or DHW heating boiler. DHW always has priority and will override (steal) a space heating boiler that is running when none are available to perform DHW heating. When this happens, the boiler will shut down and exit the space heating mode. The boiler will then re-start as a DHW heating boiler. Once the DHW cycle completes, the boiler will shut down and wait to be called for space heating again.</p>

LOCAL PUMP OFF	YES	NO/YES	<p>YES will shut off the local pump/valve when DHW heating is in effect. If the boiler is running in space heating mode, the LOCAL DELAY will be in effect before the local pump/valve shuts off.</p> <p>NO both the local and the DHW pump/valve will be enabled during DHW heating.</p>
LOCAL DELAY	5 Seconds	0-600 Seconds	<p>Seconds is the time in seconds that the local pump/valve will remain on after the DHW pump/valve is enabled before shutting off. This is part of the changeover process when the boiler was running in space heating mode and now needs to provide DHW heating.</p> <p>This timer may also be used for race conditions when operating valves. The Local Pump Flow Prove time would be used to prove flow, but with valves, the local valve may still have flow when the DHW valve begins to open. This would cause a flow fault when the local valve closes and the DHW valve still has not opened.</p> <p>The way it works, is that these timers work in parallel, but this timer only counts down when flow is present. It stops counting down when flow stops, but will not cause a flow fault until its time expires. The Local Pump Flow Prove timer counts down, but normally when flow occurs, it proves and the boiler is allowed to run. This local delay timer would then take over instead of allowing the boiler to run, and wait until its time expires before allowing the boiler to start. This timer proves that there is flow, whether interrupted or not, for x (setting) seconds. If pumps are used, this value can be set to a few seconds.</p>
PURGE TO	TANK	TANK, SPACE	<p>TANK will keep the DHW pump/valve enabled for the DHW POST PURGE time thus purging some of the boilers heat into the tank.</p> <p>SPACE will turn off the DHW pump after 5 seconds and enable the local pump/valve when a DHW heating cycle completes. This allows dumping some of the remaining heat from the boiler into the heating space (dump zone) and preventing the tank from overheating.</p>
HYBRID SENSOR	OFF	OFF, SUPPLY, DHW, RETURN	<p>Hybrid mode sensor for DHW method 5A</p> <p>OFF This sensor is selectable for DHW Method 5A only.</p> <p>SUPPLY In DHW Method 5A will maintain the DHW setpoint at the supply sensor when the OR OVR input is closed.</p> <p>DHW In DHW Method 5A will maintain the DHW setpoint at the DHW sensor when the OR OVR input is closed. This sensor is optional and needs to be added. It can be moved around and placed in the Tank, pipe feeding the tank, or other location to maintain a setpoint at that location.</p> <p>RETURN In DHW Method 5A will maintain the DHW setpoint at the RETURN sensor when the OR OVR input is closed.</p>
MAXIMUM RUNTIME	120 Minutes	0 - 200 Minutes	<p>This is the maximum runtime of the boiler when DHW heating. When this runtime is exceeded, the boiler will either Lockout or re-cycle to the Holdoff Time setting below.</p>
HOLDOFF TIME	30 Minutes	LOCKOUT to 120 Minutes	<p>If set to Lockout, the boiler will no longer perform DHW Heating. A manual reset or toggling the OR OVR input will reset the Lockout.</p> <p>If a time is set, the boiler will wait this time before it can perform DHW heating again.</p>

PUMP ALWAYS ON	NO	ON/OFF	If set to On the domestic hot water pump will run continuously.
<div> System Clock</div>			
TIME			This time needs to be entered at first turn-on and in the event that power has been lost for more than 3 days. The time is required for an accurate Night setback, log entry time-stamp, and fault time stamp.
MONTH			
DAY			
YEAR			
WEEKDAY			
SAVE			The SAVE button must be pressed after all time values have been entered to save all time values at once.

Control Settings Menu — Page 2



CONTROL	H-Net		Displays method of operation: HeatNet (H-Net)
H-Net MASTER	YES		Auto detected, based on the HEADER sensor. If the HEADER sensor is present and is set to TYPEZ, the FlexCore Futera III/Fusion control is run as a H-Net MASTER (YES). If the HEADER sensor is not TYPEZ, H-Net MASTER = NO.
MASTER TYPE	AUTO	AUTO, MIXED (COMBINATION), DHW ONLY	Two PID controls are provided, one for Space heating and one for DHW heating. This menu item selects how they are to be used. The MASTER TYPE setting is used to determine if the MASTER control is to be used as a space heating control, a combination DHW/space heating control, or just to perform DHW Heating. When set to AUTO, the boiler uses one PID control to provide space heating. When set to Combination, the control will use two independent PID controls to provide space heating and DHW heating. When set to DHW, the control only uses the DHW PID control.
HEATNET ADDRESS	255	2 –16	The local address is the address of a member device. This is normally in the range of 2 through 16. But if the FlexCore CK - Series control is a MASTER, then the default address is 255. The H-NET ADDRESS # is synonymous with boiler #.




Modular Boiler

SPACE HEATING DHW HEATING	TABS		If the MASTER TYPE is set to COMBINATION, or the DHW BOILER? setting is set to LOCAL or COMBINATION, the MODULAR BOILER SET is duplicated for each PID. Select SPACE HEATING to set the ADD, SHED, MODULATE, and MOD MAX values for the space heating PID. Then select DHW HEATING to set the ADD, SHED, MODULATE, and MOD MAX values for the DHW heating PID.
ADD BOILER DELAY	10 Minutes	0 – 60 Minutes	This is the delay time in 30sec intervals, before starting a new boiler. Boiler #1 is started immediately after a call for heat. If a second boiler needs to start, the ADD BOILER DELAY will need to expire before starting.
SHED BOILER DELAY	2 Minutes	0 – 15 Minutes	This is the delay time in 30 second intervals, before stopping a boiler. A boiler is stopped immediately when the top of the heat band is exceeded. If a second boiler needs to stop, the SHEDBOILER DELAY will need to expire before stopping.
MODULATE DELAY TIME	10 Seconds	0 – 60 Minutes	This is the time the boiler remains in min-fire before it relinquishes control to the modulation % signal.
MODULATION MAXIMUM – (LAST FIRE)	70%	(25 – 100%)	<p>This value represents the maximum % of input on the boilers if all the available boilers are not firing. Once all boilers are firing, this clamp is removed and all boilers are allowed to modulate up to 100%. When this value is limiting the input an “*” is displayed and the “INPUT CLAMP” message is displayed in the STATUS screen. This value is derived by: multiplying twice the minimum fire rate of the boiler with the least turndown (2* turndown (20% 5:1, 25% 4:1, 33% 3:1)).</p> <p>In mixed boiler size configurations, more than (2) boilers in a system, or when “bumps” in the temperature occur as boilers are added and subtracted, this value may need adjustment. The adjustments will help produce smooth temperature control when each boiler is started and stopped. This method ensures that, once a new boiler starts to fire, and holds its fire rate at the minimum setting, it does not add its BTU output to a boiler already firing at 100%. The boilers cannot be fired starting @ 0%, but start at a minimum (example: 20%) and introduce a minimum amount of BTUs into the system. Section: SETUP & OPERATION</p> <p>The MOD MAX value is also applied when using the AA terminal for High Fire and when using the 4-20 mA input for direct modulation. When these demands for heat are used, the maximum modulation the boiler can obtain when first starting is equal to the; ADVANCED SETUP: MODULAR BOILER SET: MOD MAX – LAST FIRE:. The timer value ADVANCED SETUP: MODULAR BOILER SET: ADD BOILER DELAY is used in conjunction to limit the modulation for this amount of time. Once the boiler has fired and the ADD BOILER DELAY time expires, the full modulation is available. This change is a protective means for extending the life of the heat exchanger which may consistently be exposed to thermal stress.</p>
RELEASE MODULATION MAXIMUM (DHW ONLY)	YES	YES/NO	In the DHW Heating tab, if set to Yes, the modulation % will not exceed the MODULATION MAXIMUM set in the MODULATION MAXIMUM – (LAST FIRE) setting.



Adaptive Modulation

MODULATION MODE	ADAPTIVE		If MODULATION MODE is set to ADAPTIVE on the Master boiler, the Master lowers the system modulation rate of all currently running boilers before a newly started boiler enters the Main Valve state. Upon entering the Main Valve state of a newly fired boiler, the Master waits the DELAY RELEASE time before allowing the PID to resume modulation control. With MOD MODE set to ORIG KN, The Master boiler keeps firing at the current modulation rate when a new boiler is added and lets the PID adjust modulation rate accordingly.
DROP DOWN MODE	ON CALL		If drop down is set to ON PILOT and MOD MODE = ADAPTIVE, and when a newly added boiler starts, the system waits until it enters its PILOT state before bring the system modulation down. This allows for the system to prepare for the new energy that is to be introduced. If DROP DOWN is set to immediately, the system modulation is lowered as soon as the newly added boiler is called.
DELAY RELEASE TIME	5 Seconds	0 – 600 SECONDS	Once the Main Valve opens on the newly added boiler and the MOD MODE = ADAPTIVE the Master waits this amount of time before releasing the PID to control modulation. This allows for the newly added boiler to accumulate some soak time. This is a global delay controlled by the Master boiler. It is comparable to the MODULATE DELAY setting, but this is a local setting on each boiler.
<div>  Firing Mode </div>			
FIRING MODE	RUNTIME	LOFO, FOFO, RUNTIME MIXED	LOFO: Boilers are fired Last On, First Off starting with Lead Boiler FOFO: Boilers are fired First On, First Off RUNTIME: Boilers are fired based on the runtime they report back to the Master boiler. Boilers with the least runtime are fired first and boilers with the most runtime are stopped first. MIXED: Different types of boilers can be mixed in a system and fired based on (2) Priority sets. Boilers are started and stopped within their Priority sets based on their runtime hours.
MINIMUM RUNTIME	10	1 – 750 HOURS	When the firing rotation is based on runtime, this value represents the interval in hours of runtime before rotation occurs. Boiler to Boiler.
MINIMUM OFF TIME	0	0 - 10 MINUTES	This is the time in minutes that the boiler must remain OFF before it can be fired again. Very effective in dynamic systems to minimize short cycling of a boiler and force the call to the next boiler (with next shortest runtime if True Runtime is used)
FIRING PRIORITY:	2	1 or 2	There are (2) Priority settings used by the MIXED boiler rotation algorithm. Priority 2 is the default and lowest priority. Priority 1 Is the highest priority. A Priority may be assigned to a set of boilers which fires and rotates based on time and is independent of the other Priority set.
PREDICTIVE START:	YES	YES/NO	YES: Predicts the boiler restart point in the heating band while the temperature of the boiler is drifting down through the band. The purpose of this is to ensure the temperature remains in the heating band. It also minimizes temperature swings when the boiler is stopped and started at low inputs.

			<p>This algorithm looks at the size of the band and at what rate the temperature is falling. It then calculates when to start the boiler (knowing its starting time) to ensure the boiler starts within the band.</p> <p>Once the boiler starts, the Add Boiler Delay time starts and continues to expire in and below the band. This ensures that another boiler does not start when it leaves the bottom of the band.</p>
MIXED BOILERS TAB			
START PRIORITY SET WHEN	ALWAYS FIRST	ALWAYS FIRST, OUTSIDE AIR IS ABOVE, RETURN IS BELOW	
STOP PRIORITY SET WHEN	ALWAYS LAST	ALWAYS LAST, OUTSIDE AIR IS BELOW, RETURN IS ABOVE	



Base Loading

BOILERS:	0	0 - 1	This setting works in conjunction with the ADVANCED SETUP: SYSTEM: OPTION setting BASE LOAD. Currently only (1) base load boiler is supported using relay K8
START WHEN	MODULATION IS ABOVE	MODULATION IS ABOVE, OUTSIDE AIR IS BELOW, RETURN IS ABOVE	Used in Conjunction with DELAY TIME.
MODULATION IS ABOVE	95%	0 – 100 %	The base load relay K8 will close when the Modulation is > %.
OUTSIDE AIR IS BELOW	15 °F	-40 – 130 °F	The base load relay K8 will close when the OA temp is > T
RETURN IS ABOVE		60 – 150 °F	The base load relay K8 will close when the Return temp is > T.
STOP	ALWAYS FIRST	ALWAYS FIRST, MODULATION IS BELOW, OUTSIDE AIR IS ABOVE, RETURN IS BELOW	
MODULATION IS BELOW	40%	0 – 100 %	The base load relay K8 will open when the Modulation is < %.
OUTSIDE AIR IS ABOVE	25 °F	40 – 130 °F	The base load relay K8 will open when the OA temp is > T.
RETURN IS BELOW	150 °F	60 – 150 °F	The base load relay K8 will open when the Return temp is < T.
DELAY TIME	0	0 – 60 Minutes	This setting allows a wait time before firing the base load boiler once the start condition is met.



Sensors

NOTICE

Sensors can only be changed when there is no call for heat. The boiler must be in STANDBY.

SENSOR		OUTSIDE, SUPPLY, RETURN, HEADER, DHW, STACK, SYSTEM RETURN	The first (4) sensor #'s are reserved as: OUTSIDE AIR, water SUPPLY outlet, water RETURN inlet, and system HEADER temperature. If the HEADER sensor is used (TYPEZ), that boiler performs the tasks of the MASTER boiler. If the HEADER sensor is set to NONE, its function is the MEMBER. The next (3) sensors perform DHW, Stack, and System Return measurements.
			There are (4) sensor types: NONE = does not use this sensor TYPEZ = 10k thermistor PT = 1k Platinum (only for Stack temperature) ON/OFF = 5 volts supplied out to detect a contact/switch closure.



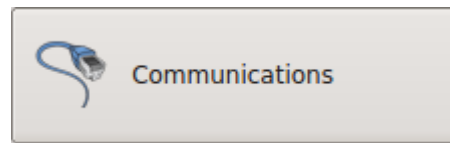
4 to 20ma

CHANNEL:	1	1	There are (2) channels that may be configured for 4-20 mA inputs or 0-10VDC inputs. They are labeled 4-20 mA (1) and 4-20 mA (2). The 4-20 mA (1) input is used to direct fire a boiler or to remotely control the setpoint of the boiler. Analog channel (1) is the primary channel used for direct modulation and remote setpoint control. The 4-20 mA (2) is a dedicated input used for metered input such as: Flow meters, etc.
MODE:	4-20 mA	4-20 mA or 0-10VDC	Type of input to use for the ANALOG IN CHANNEL selected above. The input may be changed from 4-20 mA to 0-10 VDC. The dip switch S6 also needs to be set correctly in conjunction with this setting.
START SETPOINT	50 °F	50 - 195 °F	When using 4-20 mA setpoint control in SETPOINTS: SETPOINT SOURCE. This is the temperature when a BOILER START signal (see BOILER START menu below). The Setpoint will then be mapped from 4 mA –20 mA and example default of: 50-220F
20 mA SETPOINT or 10 V SETPT	220 °F	50 - 220 °F	This is the setpoint temperature when a 20 mA or a 10 VDC signal is applied.
BOILER START	4.11 mA Or 2.04V	3.71 - 5.0 mA Or .01 - 2.50 VDC	This is the current value which will start the boiler. There is a .1 mA or .25 VDC hysteresis value. So if the Boiler starts at 4.11mA it shuts off a 4.01 mA.
PRIORITY	NORMAL		If the Priority is set to NORMAL, the boiler responds to its HEAT DEMAND inputs in the Priority that is outlined in the Control Methods section. If the PRIORITY is set to HIGHEST, The 4-20 mA input responds at the highest Priority level (same as the AA input). This method may be used by an external control to override the HeatNet control and fire the boiler using this external control (external control override). This allows for complex DHW control systems where an external control can take over the firing rate for a DHW call, and direct modulate a boiler.

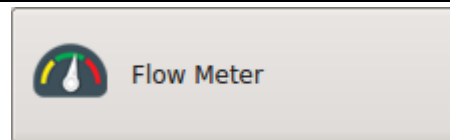


Password

ENABLE PASSWORD	NO		Provides a limited access for security, though restoring system defaults will reset the password to the value “AAAAAA”
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MODBUS ADDRESS	1	1 – 247	The MODBUS address is for communicating with Laptop, PC, or other MODBUS capable device, such as a Building Management System. It is the 2nd communication port reserved for host control.
BAUD RATE	19200	1200, 2400, 4800, 9600, 19200, 38400	This is the Baud rate for serial communication from the MODBUS port. Selectable from 1200, 2400, 4800, 9600, 19200, 38400.
DATA FORMAT	8E1	8E1, 8N1, 8N2, 8O1	8 bits -Even Parity -1 stop bit, valid settings: 8E1, 8N1, 8N2, 8O1
SETPOINT TIMER	ON	ON, OFF	If set to 'ON', the setpoint timer is enabled and requires a periodic update of its value to keep from timing out and returning control to the H-Net control. If set to "OFF", MODBUS always has control and on a loss of MODBUS communications, H-Net does not assume control.
SETPT TIME	1 Minute	1 - 240 Minutes	This time is used to automatically reset the SETPOINT TIMER when any Modbus value is written. If it is set to 1 minute, a periodic write to one of the registers must occur within 1 minute otherwise the BMS Setpoint will revert back to the System/Local setpoint.



ENABLED	YES	YES, NO	If a flow meter or flow control is to be used, set to YES
GLYCOL MIX	0%	0 – 100 %	Any mix over 10% de-rates the flow by 30% (rule of thumb method). Example: if the LOWEST FLOW = 50 GPM, HeatNet will calculate a New Lowest Flow required to be 65 GPM. The LOWEST FLOW does not need to be changed, but is calculated to 65 GPM and that value is used by HeatNet.
INPUT TYPE	VOLTS 2	CH2 (V), CH2 (mA), BMS,	<p>This setting determines where the flow values are originating. If set to Volts (2), then a Flow meter is providing a 0-10V signal on J10B 4-20 mA (2). Ensure that S6 switch 2 is UP for 0-10VDC.</p> <p>If the setting is mA (2), then a Flow meter is providing a 4-20mA signal on J10B 4-20 mA (2). Ensure that S6 switch 2 is DOWN for 4-20 mA.</p> <p>If the INPUT TYPE is set to BMS, a Flow Limited or a Boilers Limited method can be used. With Flow limited a GPM value can be written to the BMS GPM Modbus register 40019 with a valid flow. If the Boilers Limited method is to be used, the number of boilers that the BMS would allow HeatNet to control is written into Modbus register 40020.</p> <p>See the Flow Options section for more details.</p>

LOWEST FLOW	BY BOILER TYPE	0-500 GPM	This is the automatic value loaded and will equal the lowest flow required for this boiler (it is adjustable). It should be equal to the lowest flow of the largest boiler in the system.
HIGHEST FLOW	BY BOILER TYPE		Currently not used.
FULL SCALE	PER FLOW METER	0-1600 GPM	Enter the value of the full scale reading on the calibration card that came with the flow meter.
FLOW FACTOR	BY BOILER TYPE	PPG	Currently not used.



Interlocks

CONFIGURE INTERLKS			The 24 VAC interlocks can be enabled or disabled for reporting.
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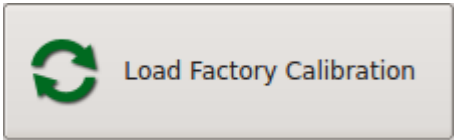
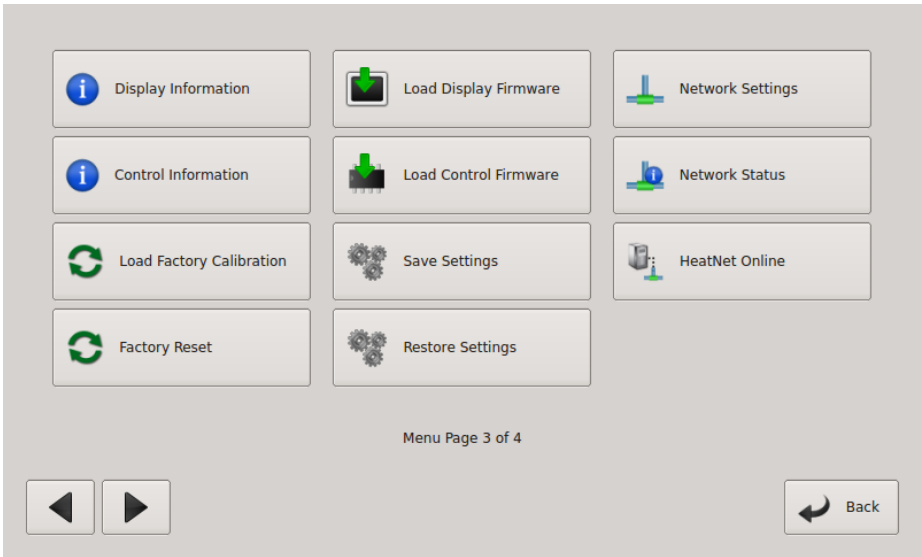


Boiler Type

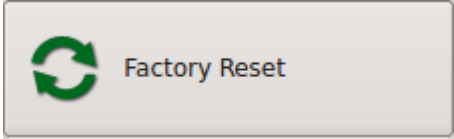
PRODUCT:	MB/MW 500	MB/MW 500 - MB/MW 10000	The product type allows configuration of the control for a product (and given a personality). This allows the control to be used/interchanged with many products. The following fields will be adjusted for the personality of the product.
CONDENSING	YES		This defines a boiler as condensing or non-condensing.
BTU INPUT	PER BOILER TYPE		This is the BTU input rating of the boiler. This value is not used with this released version and is displayed only for reference. Future releases may incorporate this feature. Check the revision history sheet on the website.
BLOWER	VFD	VFD, AMETEK, EBM	This is the blower type associated with the product. This should not be changed manually. Due to FIII/Fusions using Variable Frequency Drives, this setting needs to be adjusted for Whirlwind (Ametek) models. The default is for a VFD except for the FlexCore CK Series.
MASS	MEDIUM	LOW, MEDIUM, HIGH	This defines the mass of the boiler. This value is not used with this version and is displayed only for reference and future applications. Check the revision history sheet on the website.
TURNDOWN	5:1	3:1, 4:1, 5:1	This is the turndown of the boiler. For the FlexCore CK -Series the default is 5:1 and determines the minimum firing percentage. 5:1 = Min 20%, 4:1 = Min 25%, 3:1 = Min 33%. NOTE: The boiler must be set up for operation at this Turndown rate using the Calibrate settings. This TURNDOWN setting only controls the displayed percentage.
ALTITUDE	LESS THAN 2000FT	LESS THAN 2000 FT, GREATER THAN 2000 FT, GREATER THAN 4000 FT	This is the Altitude in feet of where the boiler is installed. On Ametek Blowers it limits the blower output for low altitudes and allows a higher output at higher altitudes. This setting sets the upper range limit of the MAX VFD setting.

OPTION:	NONE	NONE DUAL FUEL BASE LOAD	<p>When set to DUAL FUEL, input T3/ RESERVED, OPTION input is used to control the DUAL FUEL OPTION relay via K8 contacts on J4.2 &.6. When set to NO OPTION the input T3/RESERVED, OPTION relay K8 on J4.2 &.6 is inactive.</p> <p>When set to BASE LOAD, the Option Relay K8 on J4.2 &.6 is used as an enable contact for a base load boiler. The J4.1 &.5 0-10vdc/4-20 mA output is used to modulate the base load relay if it is of the modulating type.</p> <p>The limitation of the OPTION menu is that Dual Fuel cannot be used with a Base Load boiler.</p>
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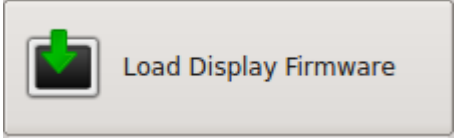
Control Settings Menu — Page 3



CONFIRM BOX			If the OK button is pressed, the factory set MIN, PILOT, and MAXIMUM blower rates will be loaded
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CONFIRM BOX			If the OK button is pressed the factory default setting for all menus are loaded. This does not include the factory calibration values.
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LOAD DISPLAY FIRMWARE BOX			<p>The Display firmware is independent of the HeatNet control's firmware. A separate Display firmware file is required in order to update the display. This needs to be placed on the USB drive and plugged into the front panel of the boiler.</p> <p>This file will include any upgraded manuals, drawing, and revision sheets.</p> <p>Begin by selecting the file from the USB disk and following the on screen instructions.</p>
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Load Control Firmware

			<p>Enters the Load Firmware menu. Loading new firmware allows for upgrades and bug fixes to the HeatNet control. See the SOURCE section below or USB FEATURES section for help in loading new firmware. Check the http://www.rbiwaterheaters.com/ website periodically for firmware updates.</p>
USB DRIVE		USB DRIVE, SAVE FILE	<p>Selecting the USB DRIVE tab will read the FIRMWARE directory on a flash drive and display any .hex files located in the FIRMWARE directory. Follow the on screen prompts and then select a file using the arrow keys. Once a file has been selected, a STORAGE LOCATION needs to be selected. There are (2) storage locations for the new file. Location 1 is used for normal updates and Location 0 is for the factory stored backup file. When the Storage location (default is Location 1) is selected the file will be loaded into a permanent storage memory location. Next, the control will reboot and copy this new program into running memory, reboot, load factory defaults, and then reboot again.</p> <p>NOTE: A directory named “firmware” must be on the drive, and all .hex files stored there.</p> <p>Selecting the SAVE FILE tab will display the currently stored files in the storage memory locations. Use the arrow keys to select a stored file for copying to running memory. When SELECT is pressed the file will be marked so it will be loaded on the next power cycle. Power cycle the boiler to begin copying the file from stored memory to running memory.</p> <p>NOTE: to access the factory backup program, the P3 BOOT shunt on the control needs to be connected and the CAL/NORMAL switch placed in the CAL position. If the control is power cycled in this condition, the factory program will overwrite the existing running program. If in the LOAD FIRMWARE menus, STORAGE LOCATION 0 will be an allowed storage location.</p>





Save Settings


SAVE SETTINGS	ONBOARD MEMORY	ONBOARD MEMORY USB FILE	<p>Enters the Save Settings menu. Saving the settings allows you to save the boiler settings to the on-board memory or to a file on a USB drive. This is useful after setting up the boiler so the settings are not lost. This should also be done prior to performing a factory reset. Saving the settings to a USB drive allows you to set up multiple boilers and can save time after a board replacement.</p> <p>ONBOARD MEMORY Enter the save SAVE SETTINGS menu and select the SAVE button. A progress bar will appear and when finished the settings will be saved to the onboard memory.</p> <p>USB FILE Enter the save SAVE SETTINGS menu. In the To Location: box change to USB File Enter the (select file) box and a keyboard will appear. Under the Drives: you will see the USB drive, select it.</p>
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Restore Settings

RESTORE SETTINGS	ONBOARD MEMORY	ONBOARD MEMORY USB FILE	Enters the Restore Settings menu. Restoring the settings allows you to reload the boiler settings from the on-board memory or from a file on a USB drive. This can be helpful after performing a factory reset, loading firmware, or when settings are changed by someone inadvertently. Restoring from a USB is useful upon control board replacement.
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Network Settings


Network Status

HeatNet Online


HeatNet Online is an Internet (over Ethernet) connection between a HeatNet control and the Mestek HeatNet Online Web Server. Using this connection, the control board will periodically send messages containing all data to capture the current operational state of the boiler. If the boiler is a master, data from all its member boilers will also be sent. The HeatNet Online server stores this information in a database. Users can log in to the HeatNet Online Web Site (www.heatnet.net/heatnet-online.aspx) to view both present and historic data. The server also monitors the data in real time and will send out email alerts for faults, warnings, and other conditions that may require attention.

For setup information, please refer to the **LCD Touchscreen HeatNet Online Setup Instruction Manual**.


Control Settings Menu — Page 4

IOM Manual

The IOM Manual button when pressed, loads the Display firmware release PDF of the Boiler’s IOM.

HeatNet Manual

The HeatNet Manual button when pressed, loads the Display firmware release PDF of this manual.

All Documents

The All Documents button when pressed, displays all the files available for reading, including the wiring diagrams of the boiler for the Display firmware release.

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260 North Elm Street
Westfield, MA 01085
Phone: (413) 568-9571
Fax: (413) 568-9613

7555 Tranmere Drive
■ Mississauga, Ontario L5S 1L4 Canada
Phone: (905) 670-5888
Fax: (905) 670-5782

www.rbiwaterheaters.com

