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HEATNET® 3.0

FUTERA III
FUTERA XLF
FUTERA FUSION

HeatNet® V3
Color Display Supplement

Color Display menus and descriptions for firmware Version 4.15

This supplement applies only to version 4.15 firmware on version 3.x 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.

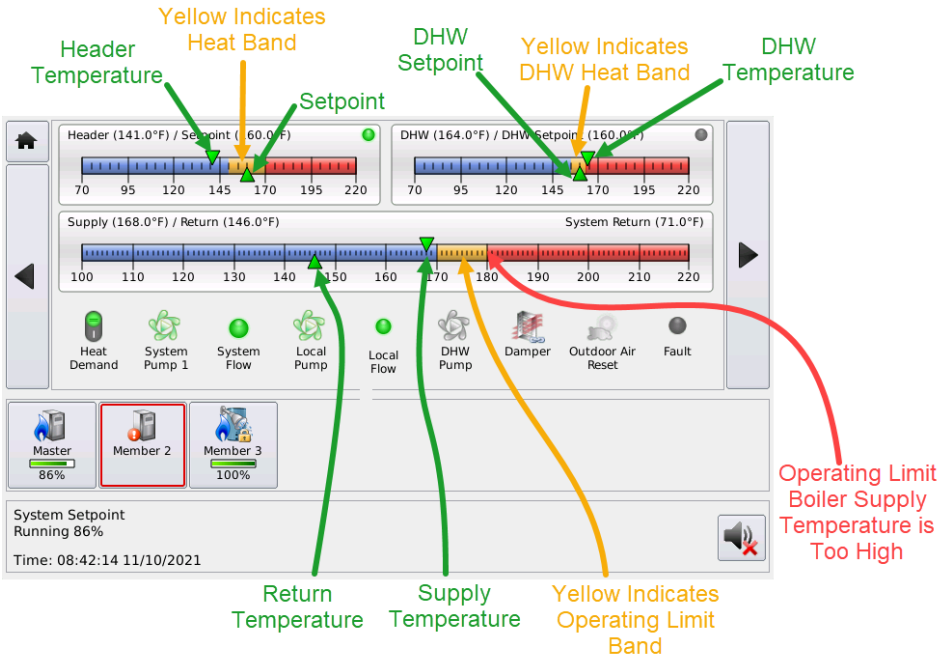
Do not use the boiler during construction. Construction dust and particulate, particularly drywall dust, will cause contamination of the burner, resulting in possible severe personal injury, death or substantial property damage. The boiler can only be operated with a dust-free air supply. Follow the 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.

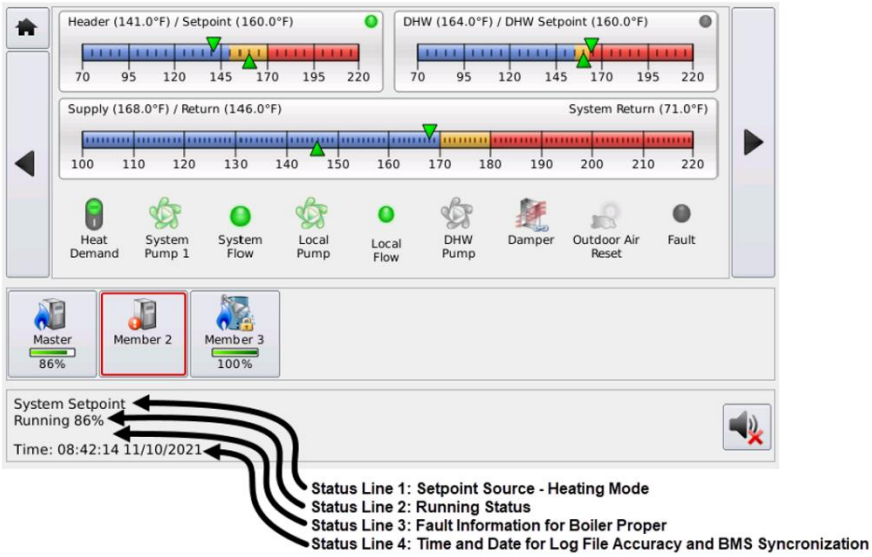
Home Screen

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



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 fireboiler 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 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 theH-Net control issues a start signal to the ignition control and doesn't receive a Blower Relay signal, 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.

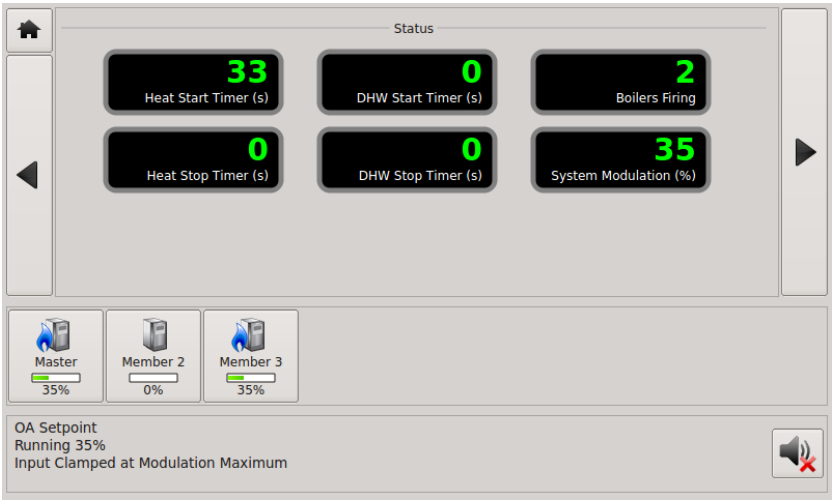
Failsafe: Low DHW Temperature	The boiler has entered Failsafe mode due to a low DHW temperature.
Failsafe: Low Header Temperature	The boiler has entered Failsafe mode due to a low Header temperature.
Failsafe: Low Return Temperature	The boiler has entered Failsafe mode due to a low Return temperature.
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 seconds 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 seconds 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
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.

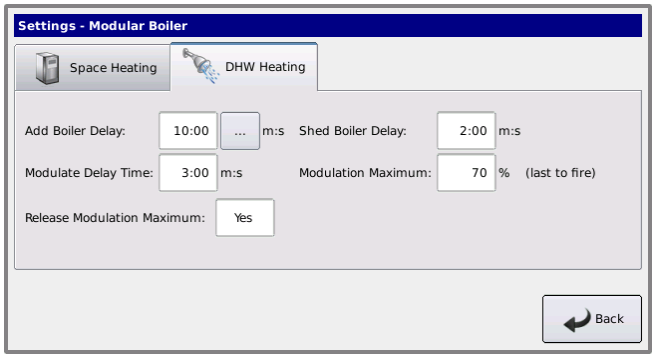
Waiting for Damper to open	This is the Damper proving time when the damper relay closes until the Damper prove interlock closes on J12B.7 & J12B.8.
Waiting for Flow	This is the flow proving period that is in effect when starting the boiler. The pumps/valves would have been called on prior to this message. 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 a ir 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

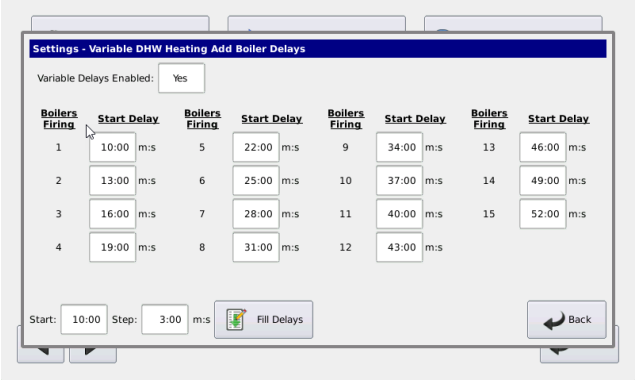


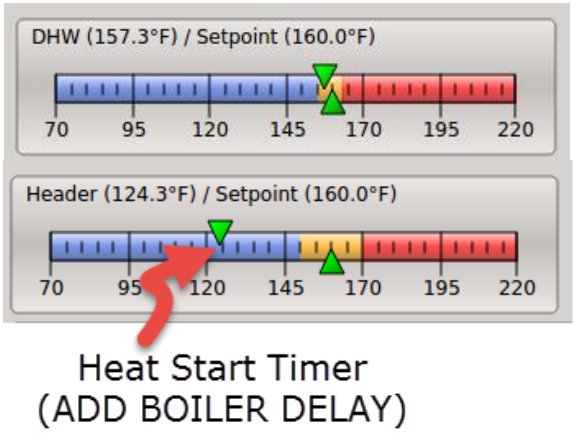
The above screen on the Master boiler displays the start and stop timers that are used to bring on boilers below and shed them above the heating band. When the Header temperature is below the band, the Heat Start Timer (Add Boiler Delay Timer) is started. Once it reaches 0, the next boiler will fire 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.

HeatNet now incorporates an adjustable **Add Boiler Delay.** Selecting the 3 dots  opens the menu.

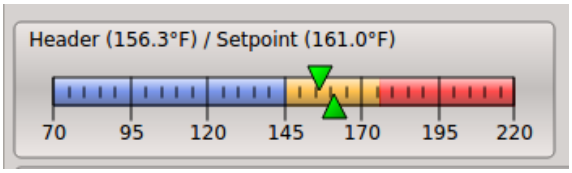


The example shows a 10-minute delay for the first boiler and increases by 3 minutes for each additional boiler.





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

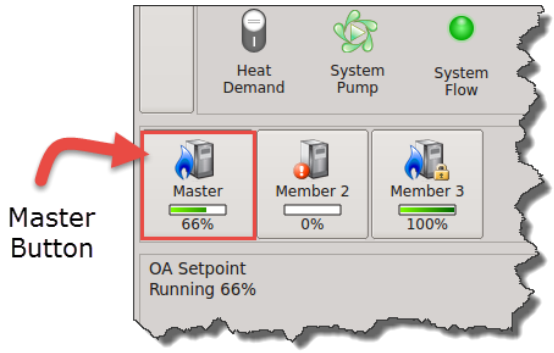


All boilers running are modulated to maintain Setpoint. Boilers are not added or shed while in the heating band (Yellow), except for when Predictive Start is set to YES. If Predictive Start is used, and when the temperature is falling fast through the band, a boiler will be started when in the band.

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

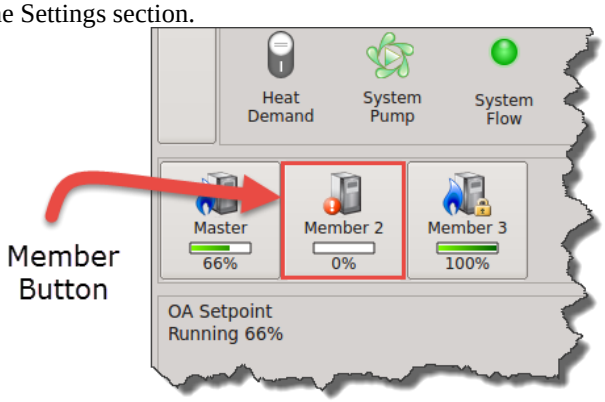
The remaining Status screens are informational and self-explanatory. These include: Temperature Sensors, Analog I/O, Interlocks - Ignition Signals – Stage Control inputs, Graphing, OA
Curve, and Runtimes.

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



Pressing The Master boiler's button will bring up the Master's information screen. Information about the boiler is presented.

In the Bottom Left corner there is the Settings button which will allow changes to the operational settings of the boiler. See the Settings 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, including making Settings changes and the Log. These need to be viewed on each Member boiler directly.

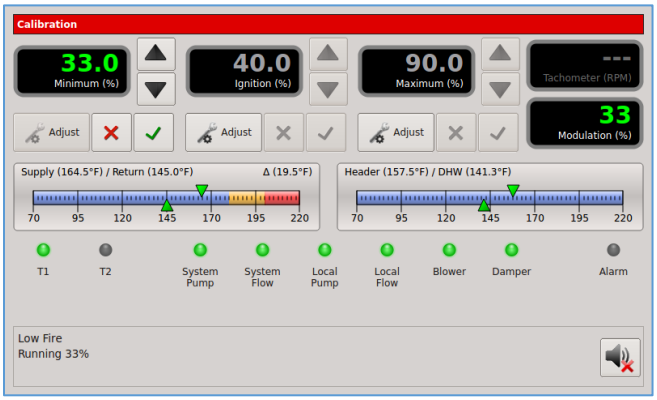
Next to it is the Log File button. Pressing this button will allow viewing of the log file. See Log Entry section.

Calibration

NOTICE **The calibration of the Futera III/Fusion Series boiler should only be performed by a licensed 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.



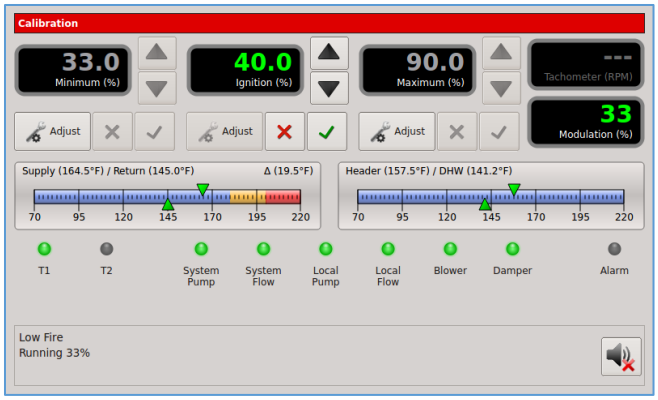
Be sure to set this switch back to NORM when the calibration is complete, otherwise no external control inputs will work (except T1-T2), the display will always indicate CALIBRATE and some of the runtime temperatures will not be displayed.

The MIN VFD setting, the MAX VFD setting, and the Ignition setting can be adjusted in the calibration displays. 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.

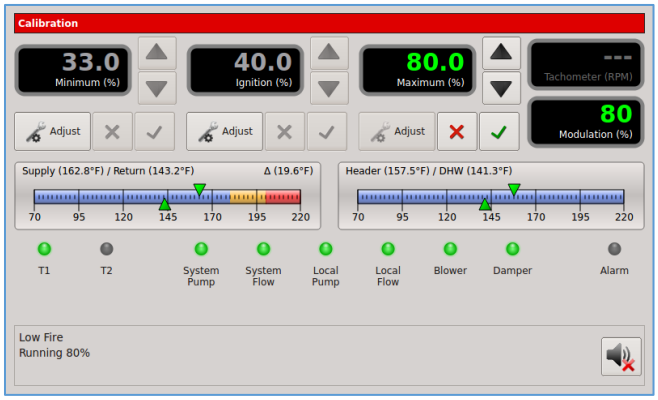
NOTICE The Low Fire Hold switch is located near the Calibration switch.

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 MIN VFD 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.



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.



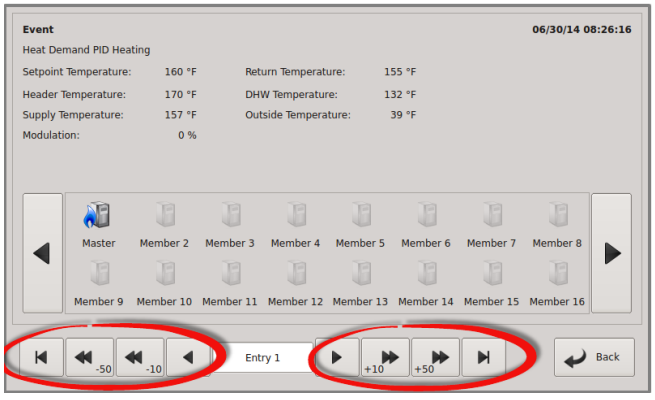
The Maximum value is used to set the maximum fire rate of the boiler. To adjust the Maximum fire rate of the boiler, press the Adjust button under the Maximum (%) value shown in the display. The percentage value will turn green. Then use the arrow keys to adjust the value up or down. Adjust it using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

Log Entry

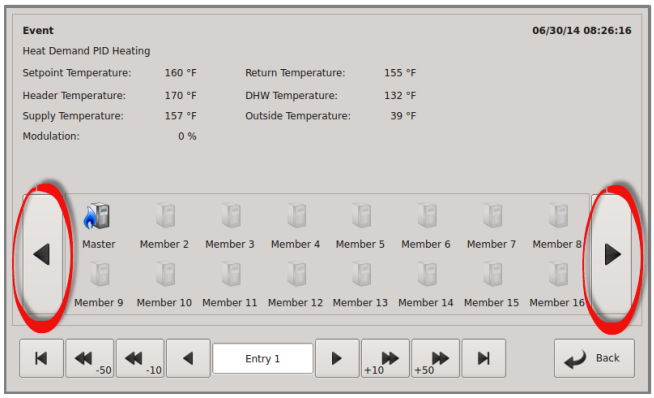
The Fire Tube-Series H-Net control contains a log that records the major activity (events) in the operation of the boiler. This activity includes interlock faults, boiler starting and stopping events, power cycles, misc. faults, and types of calls-for-heat (control inputs). Setting the time clock to 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.

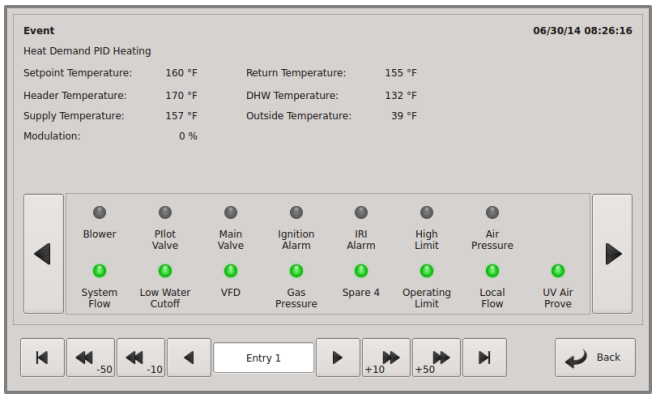
An event in time of the boiler's state is presented via multiple screens. Each screen event can be stepped through using the arrow keys.



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 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.

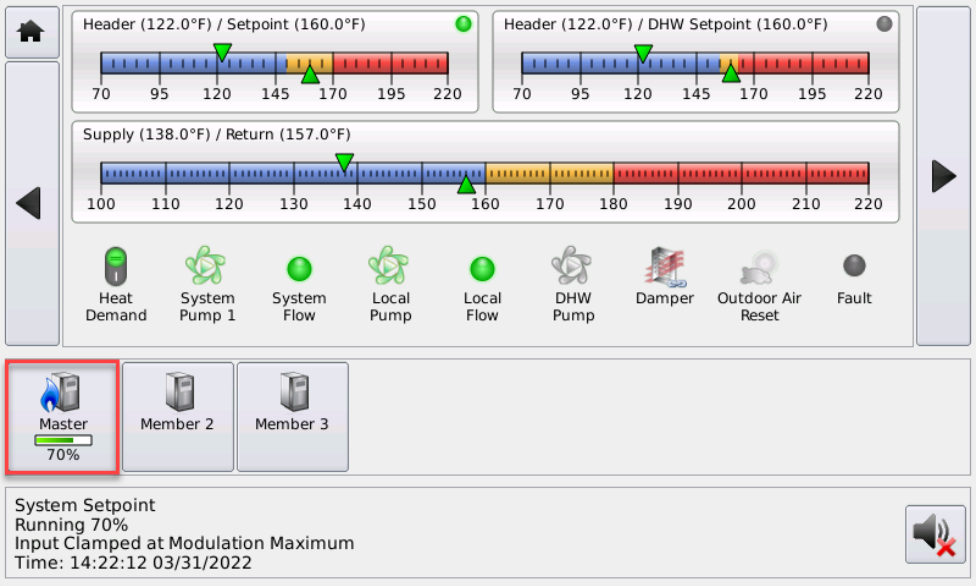


They are the Circulator Pump state, and the ignition condition (Main Valve, Pilot Valve, Blower, and the Ignition alarm). There are also indicators for interlocks and auxiliary functions.

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

SETTINGS

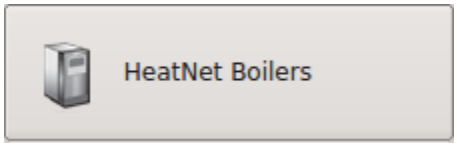
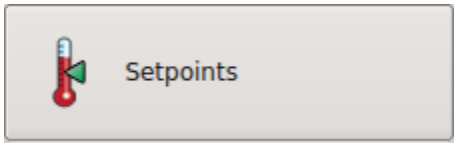
To Enter the Settings menus the first boiler button must be selected. The button is highlighted by the red box.



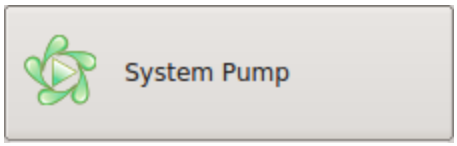
Next, press the Settings box as also illustrated by the red box.

The Settings Menu Page 1 will then be displayed.

CONTROL SETTINGS — PAGE 1

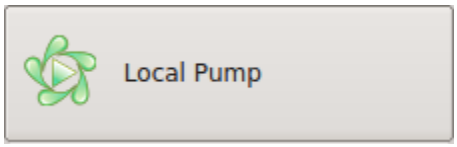
MENU	DEFAULT VALUE	RANGE	DESCRIPTION
			
# OF BOILERS	1	(1-16)	If operating as a member.
LEAD BOILER #	0	(0-16)	# Of first boiler to run, determines the fire order in rotation. A 0 disables the Lead Boiler function. Firing Mode determines lead.
BOILER GRAPHIC	M	(M-16)	This Box displays the boilers auto 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	30 °F	(2 -50 °F)	Differential temp around setpoint used to stage boiler(s) OFF/ON
OPERATE LIMIT	215 °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	20 °F	(1-50 °F)	Limits external input % when in (OP LIM - OP LIM BAND)
SETPT SOURCE	AUTO	AUTO 4-20mA	AUTO = Local/ System/ WWS Setpoint is used 4-20mA input is mapped to a setpoint.

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

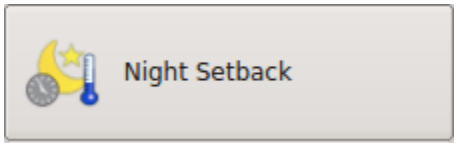


SYSTEM PUMPS	1	1 or 2	The number of system pumps connected.
POST PRGE TIME	2 minutes	(2-60min)	Time in minutes to keep system circ. pump on after boiler stops
ROTATION:	NONE	NONE SYSTEM HOURSRS PUMP HOURS	
ROTATE TIME	240 hrs	1-1000 hrs	If ROTATION is set to SYS HRS, ROTATE TIME is used to switch pumps 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 hrs	Indicates how many hours the HeatNet control has accumulated on pump 1.

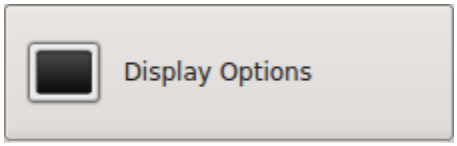
PUMP2 TIME		0-999999 hrs	Indicates how many hours the HeatNet control has accumulated on pump 2.
ALWAYS ENABLED	OFF	ON/OFF	ON = Pump never shuts off. Used when there is only 1 system pump in the system.
OVERRIDE ENABLED IN WARM WEATHER SHUTDOWN	OFF	ON/OFF	Priority mode for the system pump while in Warm 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.



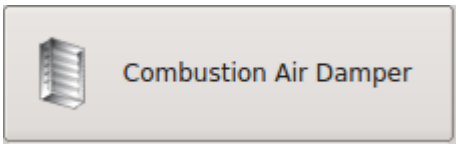
DELTA TEMPERATURE ENABLED	OFF		ON: Use Delta temperature to shut pump off when temperature across boiler is less than DELTA TEMP setting.
DELTA TEMPERATURE	10 °F	(2 – 50 °F)	
POST PURGE TIME	2 minutes	(1-60min)	Time in minutes to keep local circ. pump on after boiler stops
ALWAYS ENABLED	OFF		Pump never shuts off.
LOCAL PUMP VFD	OFF	ON/OFF	ON: Outputs a 0-10VDC or 4-20mA 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	10s	10-240 sec	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. **Master Valve Remains Open Update** If the boiler was not firing, the local pump/valve post purge time reduced to 30s, instead of the full post purge time, and the flow prove time maximum is increased to 600s to allow for longer valve stroke times. The amount of flow required for a boiler during the pump post purge period is reduced to the minimum flow rating of the boiler. This is meant to address the flow faults the Member boiler was triggering when the Master opened its valve during the Member's pump post purge time, reducing the flow. The system will need to maintain a little more the twice the minimum flow of the boilers to still be able to prove flow in post purge with 2 valves open. We can also use the Local Delay time setting, located in the DHW settings menu page 2, to require the boiler to prove the required flow for a selected delay time before trying to fire. This value defaults to 5s but can be increased up to 600s. The boiler will not prove flow, and try to fire, until it sees the required flow present for the delay time set in the Local Delay setting. Ideally this value should be set to the stroke time of the valves to assure all the valves are in their final position before attempting to fire.



	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

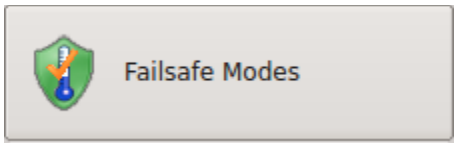


ENGLISH	° F		Fahrenheit scale, English is default
	GPM		
METRIC	° C		
	LPM		

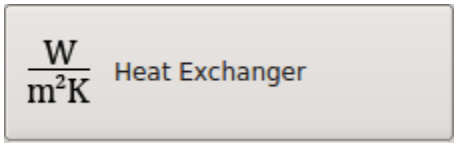


COMBUST AIR DAMPER			
TYPE		LINKED/COMMON INDEPENDENT	The LINKED/COMMON setting allows one common damper to be used and controlled by the Master Boiler. All Member boilers must have their damper prove inputs wired as per the **Error! Reference source not found.** shown on the Heatnet V3 Manual. INDEPENDENT: Individual dampers are in controlled by their respective boiler.
IN USE?	YES		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 the **Error! Reference source not found.** shown on the Heatnet V3 Manual. 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 – 4min)	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.

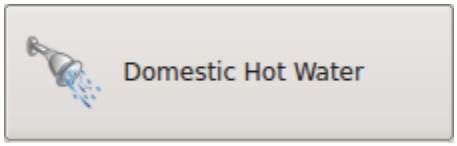


RUN IN LOCAL IF: H-NET COMMUNICATIONS LOST	OFF		If this entry is set to ON and the Member boiler does not see any communications coming from the Master boiler, this boiler will run in LOCAL. The boiler will continue to run in LOCAL until communications are re-established or this entry is set to OFF.
LOW TEMPERATURE SENSOR	OFF		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.



ALARM TYPE	WARNING	FAULT/WARNING	**FAULT** will stop the boiler when the Delta T has exceeded its setting. **WARNING** will allow the boiler to continue running but produce the Warning message.
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		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
SEND RETURN	RETURN	RETURN, SYSTEM RETURN	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. 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.

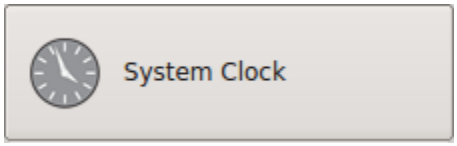
TEMPERATURE DISAB	OFF	SYSTEM RETURN, RETURN, OFF	This setting is used by a Member boiler (primarily a non-condensing type) to determine which return sensor to look at when determining if it is safe to fire. Its purpose is to keep non-condensing boilers from firing in a condensing mode. **SYS RET** the boiler will use the Return temperature sent from the MASTER boiler. **RETURN** the boiler will use its own Return sensor. If it is set to OFF, then this feature will not be used. 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.
TEMP<140F	140	135F – 200F	Setting determines where the TEMP DISAB return sensor's threshold temperature disables the boiler from firing.
EXTENDED POST PURGE TIME:	0s	0-600s	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. 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.



BOILER MODE	AUTO	AUTO, LOCAL, COMBINATION	Setting this value to LOCAL or **Combination** enables the DHW PID. Setting this value to NO disables the DHW PID. **LOCAL** allows the boiler to run in DHW locally off 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. **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. **AUTO** turns off the DHW PID, but still allows control of the Master's DHW pump and DHW setpoint for backwards compatibility. ***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 AUTO. 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 only allows configuring of the LOCAL pump.

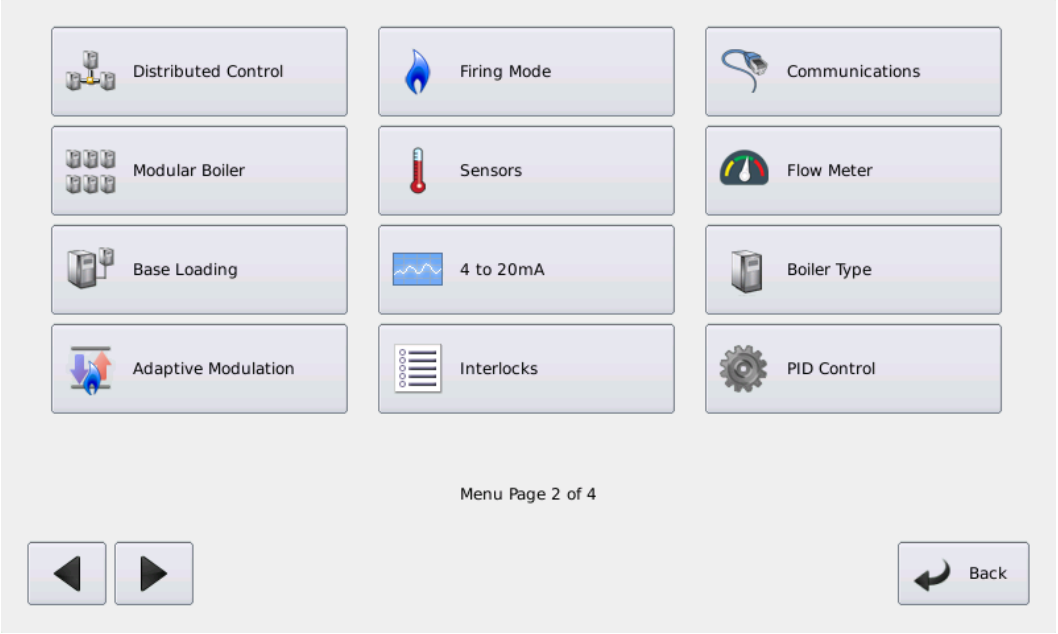
SETPOINT	160 °F	40 – 200 °F	Setpoint that the boiler/system will target when a call for DHW.
LOWER BAND	5 °F	1 – 30 °F	DHW SETPOINT – LOWER DHW DIFF: if the DHW water temperature is less than this temperature, the Boiler/System will enter DHW Heating mode if DHW BOILER? is set to LOCAL or MIXED **Combination**.
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	120s	0-600 secs	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	OFF	OFF, NO CYCLE, CYCLE	**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. **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.
LOCAL PUMP OFF	NO	NO, YES	**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. **NO**-both the local and the DHW pump/valve will be enabled during DHW heating.
LOCAL DELAY	5 Seconds	0-600 seconds	**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. 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.

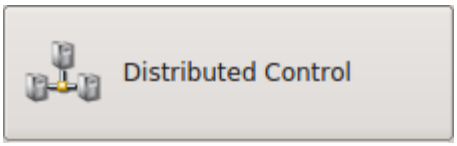
			The way it works, is that these timers work in parallel, but this timer only counts down when flow is present. It stops counting down when flow stops but will not cause a flow fault until its time expires. The Local Pump Flow Prove timer counts down, but normally when flow occurs, it proves, and the 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.
PURGE TO	TANK	TANK, SPACE	**TANK**-will keep the DHW pump/valve enabled for the DHW POST PURGE time thus purging some of the boiler's heat into the tank. **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.
HYBRID SENSOR	OFF	OFF, SUPPLY, DHW, RETURN	**Hybrid mode sensor for DHW method 5A** **OFF**-This sensor is selectable for DHW Method 5A only. **SUPPLY**-In DHW Method 5A will maintain the DHW setpoint at the supply sensor when the OR OVR input is closed. **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. **RETURN-**In DHW Method 5A will maintain the DHW setpoint at the RETURN sensor when the OR OVR input is closed.



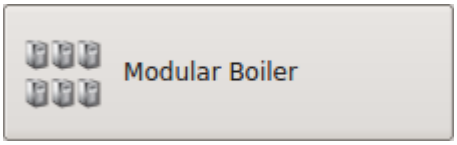
TIME			This time needs to be entered at first turn-on and in the event that power has been lost for more than 3 days. The time is required for an accurate Night setback, log entry timestamp, and fault time stamp.
MONTH			
DAY			
YEAR			
WEEKDAY			
SAVE BUTTON			The SAVE button must be pressed after all time values have been entered to save all time values at once.

SETTINGS — PAGE 2





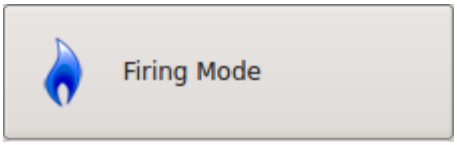
CONTROL	H-Net		Displays method of operation: HeatNet (H-Net)
H-Net MASTER	YES		Auto detected, based on the HEADER sensor. If the HEADER sensor is present and is set to TYPEZ, the Fire Tube-Series control is run as a H-Net MASTER (YES). If the HEADER sensor is not TYPEZ, H-Net MASTER = NO.
MASTER TYPE	AUTO	AUTO, 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 Fire Tube-Series control is a MASTER, then the default address is 255. The H-NET ADDRESS # is synonymous with 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	10mins	(0 – 15min)	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. The Add Boiler Delay is adjustable for each added boiler. It can be varied for each individual boiler for specific control schemes. Selecting the 3 dots  will open the variable delay settings menu.
SHED BOILER DELAY	2mins	(0-15min)	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 secs	(0 – 60min)	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%)	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)). 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 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

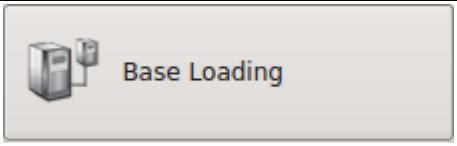
			extending the life of the heat exchanger which may consistently be exposed to thermal stress.

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	0s		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.

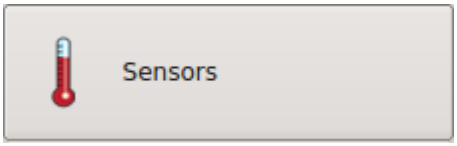


FIRING MODE	TRUE		**LOFO:** Boilers are fired Last On, First Off starting with Lead Boiler **FOFO:** Boilers are fired First On, First Off **TRUE:** Boilers are fired based on the runtime they report back to the Master boiler. Boilers with the least runtime are fired first and boilers with the most runtime 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)	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	(0-10m)	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.

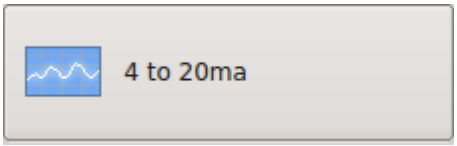
PREDICTIVE START:	YES	YES/NO	YES: Predicts the boiler restart point in the heating band while the temperature of the boiler is drifting down through the band. The purpose of this is to ensure the temperature remains in the heating band. It also minimizes temperature swings when the boiler is stopped and started at low inputs. 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. 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.
MIXED BOILERS TAB			
START PRIORITY SET WHEN	ALWAYS FIRST	ALWAYS FIRST, OUTSIDE AIR IS ABOVE, RETURN IS BELOW	
START PRIORITY SET WHEN	ALWAYS LAST	ALWAYSLAST, OUTSIDE AIR IS BELOW, RETURN IS ABOVE	



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	100%	(20–100)	The base load relay K8 will close when the Modulation is >%.
OUTSIDE AIR IS BELOW		(40–140)	The base load relay K8 will close when the OA temp is > T
RETURN IS ABOVE		(60–150F)	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	20% (20–100)	20% (20–100)	The base load relay K8 will open when the Modulation is <%.
OUTSIDE AIR IS ABOVE		(40–100 °F)	The base load relay K8 will open when the OA temp is > T.
RETURN IS BELOW		(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.

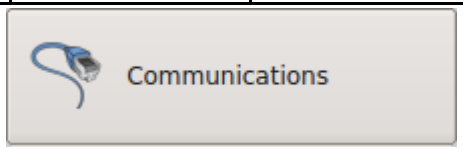


Sensors can only be changed when there is no call for heat. The boiler must be in STANDBY.			
SENSOR		OUTSIDE, SUPPLY, RETURN, HEADER, DHW, STACK, SYSTEM RETURN	The first (4) sensor #'s are reserved as: OUTSIDE AIR, water SUPPLY outlet, water RETURN inlet, and system HEADER temperature. If the HEADER 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 = do 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.

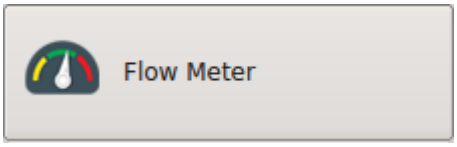


CHANNEL:	1	1	There are (2) channels that may be configured for 4-20mA inputs or 0-10VDC inputs. They are labeled 4-20mA (1) and 4-20mA (2). The 4-20mA (1) input is used to direct fire a boiler or to remotely control the setpoint of the boiler. Analog channel (1) is the primary channel used for direct modulation and remote setpoint control. The 4-20mA (2) is a dedicated input used for metered input such as: Flow meters, etc.
MODE:	4-20mA	4-20mA or 0-10VDC	Type of input to use for the ANALOG IN CHANNEL selected above. The input may be changed from 4-20mA to 0-10 VDC. The dip switch S6 also needs to be set correctly in conjunction with this setting.
START SETPOINT	50 °F	50-220 °F	When using 4-20mA 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 4mA –20mA and example default of 50-220F
20mA SETPOINT or 10 V SETPT	220 °F	50-220 °F	This is the setpoint temperature when a 20mA or a 10 VDC signal is applied.
BOILER START	4.11mA Or 2.04V	3.71 - 5.0mA Or .01 - 2.50 VDC	This is the current value which will start the boiler. There is a .1mA or .25 VDC hysteresis value. If the Boiler starts at 4.11mA it shuts off a 4.01mA.

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 4-20ma 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.

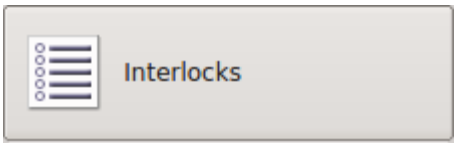


MODBUS ADDRESS	1	1 – 247	The MODBUS address is for communicating with Laptop, PC, or other MODBUS capable device, such as a Building Management System. It is the 2nd communication port reserved for host control.
BAUD RATE	19200	1200, 2400, 4800, 9600, 19200, 38400	This is the Baud rate for serial communication 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 to the System/Local setpoint.

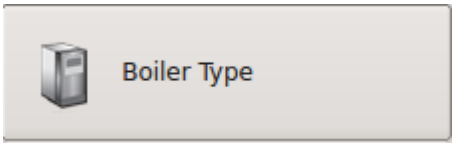


ENABLED	NO	YES, NO	If a flow meter or flow control is to be used, set to YES
GLYCOL MIX	0%	0-100%	Any mix over 10% de-rates the flow by 30% (rule of thumb method). Example: if the LOWEST FLOW = 50 GPM, HeatNet will calculate a New Lowest Flow required to be 65 GPM. The LOWEST FLOW does not need to be changed but is calculated to 65 GPM and that value is used by HeatNet.
INPUT TYPE	VOLTS 2	CH2 (V), CH2 (mA), BMS,	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 4-20mA (2). Ensure that S6 switch 2 is UP for 0-10VDC.

			If the setting is mA (2), then a Flow meter is providing a 4-2omA signal on J10B 4-20mA (2). Ensure that S6 switch 2 is DOWN for 4-20mA. 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. See the Flow Options section for more details in the HeatNer V3 Manual.
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	0		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		PPG	Currently not used.



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



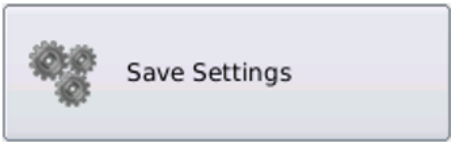
PRODUCT:	MB/MW 500	MB/MW 500 - MB/MW 5000	The product type allows configuration of the control for a product (and given a personality). This allows the control to be used/interchanged with many products. The following fields will be adjusted for the personality of the product.
CONDENSING	YES		This defines a boiler as condensing or non-condensing.
BTU INPUT	200,000		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	This is the blower type associated with the product. This should not be changed manually.

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 Fire Tube-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.
OPTION:	NONE	NONE DUAL FUEL BASE LOAD	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. 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/4-20mA output is used to modulate the base load relay if it is of the modulating type. The limitation of the OPTION menu is that Dual Fuel cannot be used with a Base Load boiler.
			
PID Control	8	2-10	Setting this value will increase or decrease the PID control. Both Space heating and DHW heating have separate PID controls designed to match each individual load.

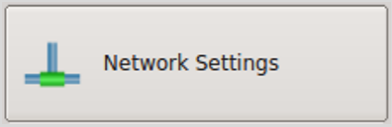
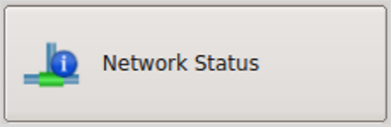
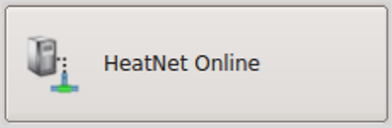
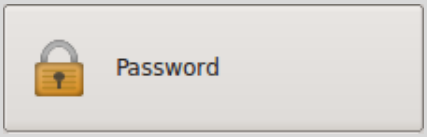
SETTINGS — PAGE 3

Confirm Box			If the OK button is pressed, the factory set MIN, PILOT, and MAXIMUM blower rates will be loaded

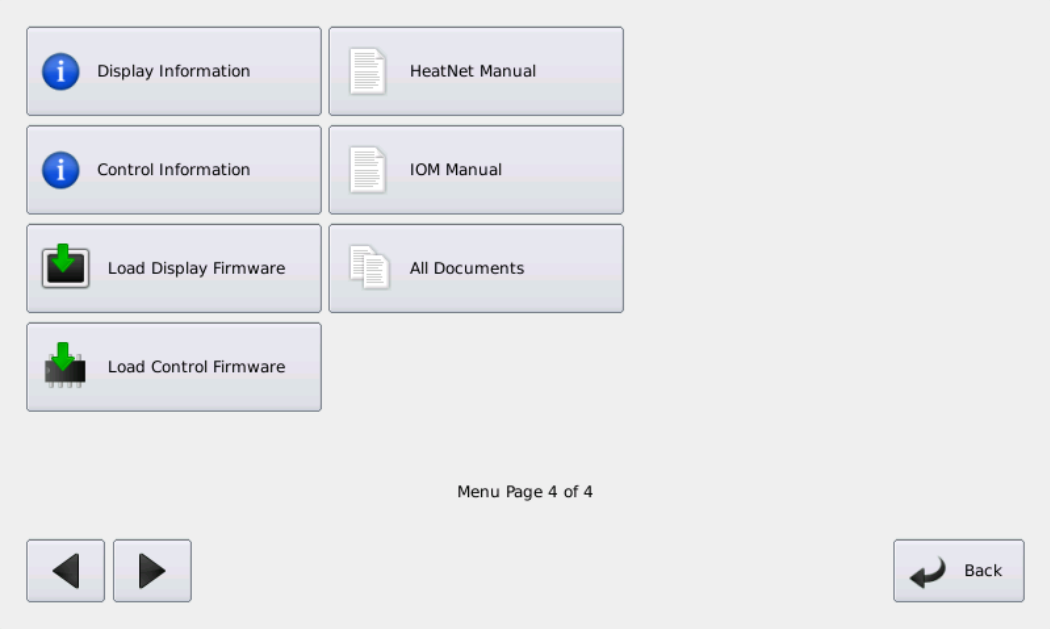
Confirm Box			If the OK button is pressed the factory default setting for all menus are loaded. This does not include the factory calibration values.



SAVE SETTINGS	ON-BOARD MEMORY	ON-BOARD MEMORY - USB DRIVE	The settings can be saved to be restored later. This is useful when the settings have been incorrectly changed by an unknown source, a factory reset, or a firmware update is performed.

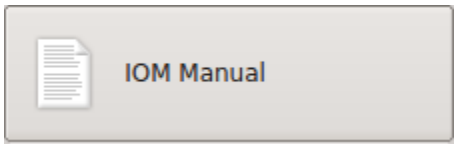
RESTORE SETTINGS	ON-BOARD MEMORY	ON-BOARD MEMORY - USB DRIVE	The settings can be restored from being saved at an earlier time. This is useful when the settings have been incorrectly changed by an unknown source, a factory reset, or a firmware update is performed.
			
			HeatNet Online is an Internet (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**.
			
ENABLE PASSWORD	NO		Provides a limited access for security, though restoring system defaults will reset the password to the value “AAAAAA”

Control Settings Menu — Page 4

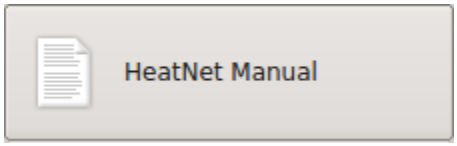


Load Display Firmware			
LOAD DISPLAY FIRMWARE BOX			The Display firmware is independent of the HeatNet control's firmware. A separate Display firmware file is required in order to update the display. This needs to be placed on the USB drive and plugged into the front panel of the boiler. This file will include any upgraded manuals, drawing, and revision sheets. Begin by selecting the file from the USB disk and following the on-screen instructions.
Load Control Firmware			
LOAD CONTROL FIRMWARE BOX			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.

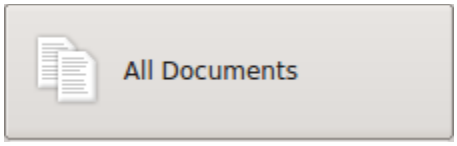
USB DRIVE		USB DRIVE, SAVE FILE	Selecting the **USB DRIVE** tab will read the FIRMWARE directory on a flash drive and display any .hex files located in the FIRMWARE directory. Follow the on-screen prompts and then select a file using the arrow keys. Once a file has been selected, a STORAGE LOCATION needs 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. **NOTE: A directory named "firmware" must be on the drive, and all .hex files stored there.** 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. **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.



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



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



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.

Note: Updating the Display firmware will update these PDF documents to the current release.

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