Advance Thermal Hydronics
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200i/KN2, KN4 Firmware Revision Sheet

Revision 3.1 Release 14 October – 2026

1. KN2 ONLY – Improved standby loss power consumption.

Revision 3.0 Release 20 January – 2015

2. The alarm relay and buzzer are now activated when the High Limit circuit trips.

Revision 2.9A Special Release 18 December-2013

Revision 2.9 Special Release 1-November-2013

Revision 2.8 Release 1- March– 2013

1. The boiler's local pump/valve relay will now remain energized when the boiler enters Warm Weather shutdown and the MASTER PUMP option is set.

2. Fixed an issue which could cause the blower prove to fail when using the Extended Purge option.

3. Corrected an issue introduced in V2.6 preventing HeatNet Control Pro from working with a 200i/KN2

Revision 2.7 Release 2- December– 2011

1. Changed the maximum temperature setting from 150F to 190F on the SETUP:OUTDOOR AIR:SET OA SETPOINTS:WATER TEMP at HIGH OA TEMP. This change was done to allow greater range.

2. Changed the default Delta T heat exchanger temperature to 60F and the maximum Delta T to 100F. Also, removed the menu item to disable the Delta T half fire protection

3. Added the ability to change the DHW water setpoint along with viewing other variables via Modbus, BACnet, and LonWorks.

    1) Added Read/Write DHW Setpoint. The DHW setpoint is located address 40018.
    2) Updated description of Setpoint Timer (a write to any read/write variable now reloads).
    3) Updated description of System Modulation
    4) Added Boiler## DHW Temperatures
    6) Added Boiler## Modulations
    7) Added Operating Setpoint

    See online Modbus register documentation.

4. Fixed issue with display modulation when using Modbus, BACnet, and LonWorks.

5. Added a Modulation Maximum hold off when using the 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: MOD MAX – LAST FIRE:. The timer value ADVANCED SETUP: MODULAR BOILER: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.

Revision 2.6 Pre-Release For Review 8- April– 2011

1. The control can now regulate to the RETURN sensor temperature value instead of the HEADER temperature value when handling a DHW Demand. This allows the HEADER temperature sensor to be located in the heating loop and the DHW sensor to be located in the DHW loop.

   NOTE: When this feature is enabled ALL Delta T features using the RETURN Sensor are DISABLED, and the temperature is reported as DHW instead of RETURN on the Home screen

   Menu Located:
   SETUP|AUX FUNCTIONS|DHW SENSOR

   Default Value is NO

2. The DHW Cycle Max default value is now OFF.

3. Varying installation conditions may cause the blower RPMs to differ between jobs when trying to deliver certain CFM. The Blower Prove functionality is now more tolerant for jobs where higher RPMs are present.

4. The KN4 now correctly controls its DHW pump when OA reset is enabled. Occasionally the DHW pump would not shut off correctly when OA Reset was in effect.

Revision 2.5 Release 14-June-2010

1. The HydroTherm KN6, KN10, and KN20 Version 3.46, added the ability to control a mixed boiler system and fire boilers depending on PRIORITY SETS. Version 2.5 of the KN2 and KN4 added a PRIORITY SET Value for compatibility with these new HeatNet Mixed Boiler Systems. (For more information see the KN6, KN10, KN20 Supplemental Control Manual, which is available on the HydroThermKN website.)

   The PRIORITY SET can be set to a value of 1 or 2. A value of 2 is the default value and is the lowest priority.

   Menu Located:
   SETUP|ADVANCED|SYSTEM|PRIORITY

2. The Control now monitors Delta T across the heat exchanger, by using the Supply and Return sensors. The input to the boiler can be limited if the Delta T setting is exceeded.

   The default value of the Delta T limit is 100F, and the default value for LIMIT RATE is YES. If this value is exceeded the boiler will run at ½ of the required input until the Delta T falls 10 degrees F below the Max Delta T value. This feature can de disabled by setting LIMIT RATE to NO.

   Delta T is now displayed on Home screen.

   Menu Located:
   SETUP|AUX FUNCTIONS|HEAT EXCHANGER|DELTA T
   SETUP|AUX FUNCTIONS|HEAT EXCHANGER|LIMIT RATE

3. Corrected an issue when writing the setpoint using Modbus, LonWorks, or BACnet. If the setpoint is written repeatably within a few minutes, a condition may arise where the real time clock will not increment the time. This has been corrected with this release.

4. Added a Setpoint Timer Enable menu which allows disabling the setpoint timer feature used for BMS control. The default Value is ON. If set to 'ON", the setpoint timer is enabled and requires a periodic update of its value to keep from timing out and retuning 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.

   Menu Located:
   ADVANCED SETUP|COMMUNICATIONS|SETPT TMR

5. The Communications Parity menu changed to FORMAT to make selections clear. The default value is 8E1 (8 bits -Even Parity -1 stop bit) Valid settings include 8E1, 8N1, 8N2, or 8O1

   Menu Located: ADVANCED SETUP|COMMUNICATIONS|FORMAT

6. ADD DELAY timer now displays 0 if all boilers are firing

7. ADD and SHD timers are now displayed on the same Home screen.

8. Defaults are now loaded automatically when firmware is updated.

9. The graphical representation of the Heat Band and the temperature is now more linear and does not "jump" in and out of the band.

10. OA TEMP is now correctly displayed in LOG entries

11. LOCAL PUMP POST PURGE TIME maximum setting is now 60 minutes.

12. The control will automatically try to ignite 60 minutes after an ignition lockout.

Revision 2.4 Release 21-December-2009

1. ADD DELAY Timer now does not get reset until the temperature is 1.5 degrees into the band.

   Observed a situation at a site where during the ignition sequence, and the temperature at the lower band limit, the temperature would change enough to push it in and out of the band causing more than 1 boiler to start at once.

Revision 2.3 Release 8-July-2009

1. Master Log Page added: The Master now has access to a 4th Log Page showing all H-NET boilers that were firing when the log entry was made.

2. Added Fail Safe Modes in the AUX FUNTIONS menu:
   Lost BMS COMM: If a H-NET MASTER does not recieve communications from the BMS for 10 minutes, it will fire to maintain Header temperature.

   Lost H-NET COMM: If a MEMBER does not receive communications from the H-NET MASTER for 10 minutes, it will fire to maintain Supply Temperature.

Low Temperature: If the selected sensor drops below the LOW TEMP Setting the boiler will fire to local setpoint, and then turn off.

3. Extended Fan Post Purge added IN AUX FUNTIONS: The fan can Post Purge for up to an addition 10 minutes after the required 10 second purge, defaults to 0.

4. DHW CYCLE MAXIMIZATION added (Default ON): If the boiler is handling a high temperature DHW demand and the DHW Demand is removed, but a Low temperature (OA Reset) Heat demand is still present, the boiler will remain firing at low input while it drops back into the Heat Band. The boiler would previously shut off and then fire again once the water temperature reached the bottom of the band.

Revision 2.2 Release 11-March-2009

1. KN2/rAy DHW Pump Priority Added: Local Circulator can optionally be de-energized on DHW Demands under PUMP OPTIONS menu

2. The Audible Alarm can be disabled under the OPTIONS Menu. Defaulted to SILENCED

3. Ignition Delay Time (0 – 15 minutes) added in the AUX FUNTIONS Menu. This is the time a Heat Demand must be preset before the boiler is allowed to fire, the circulator pumps operate normally. This only affects Local Heat Demands.

Revision 2.1 Release 9-October-2008

1. Active Energy Management (AEM) is now back to Indoor Air Reset (IAR). All functionality remains the same, only the name has changed

Revision 2.0 Release 8-August-2008

1. Initial KN4 Release, incorporated several features from the commercial H-Net.

2. KN4 ONLY – DHW Pump control using BYPASS Relay. Available DHW Pump modes:

   N/A – Does not its DHW Pump contracts
   Enabled – The DHW pump will be enabled on DHW demands, no pump priority
   Priority – The DHW Pump will be enabled and the LOCAL Pump will be disabled on DHW demands
   Multi – The DHW Pump will ben enabled on DHW demands, and the LOCAL pump will only be enabled when the boiler is firing.

   DHW PUMP has Fixed 2 minute Post Purge

3. KN4 ONLY – MAX BTU only goes up to 103%. The KN4 uses more output of the blower.

4. rAy/KN2 ONLY - Single Firmware for KN2 and rAy – Displays " rAy/KN2 V 2.0 "

5. Indoor Air Reset (IAR) is now Active Energy Management (AEM). AEM calculation can now be based on the NEEDIEST zone, the AVERAGE of all active zones, or a SPECIFIC zone.

6. Adaptive Modulation has been added as default. Accessed under ADVANCED SETUP| ADAPTIVE MODE

7. The Modbus/Heat-Net functions have been updated to be compatible with the commercial Heat-Net controls version 2.0 and greater. **Note: rAy/KN2 Versions 1.x are not compatible with rAy/KN2 Versions 2.0 and greater.**

8. Available Heat-Net boilers now show up as numbers: M23456789$^{1}_{0}{}^{1}_{1}{}^{1}_{2}{}^{1}_{3}{}^{1}_{4}{}^{1}_{5}{}^{1}_{6}$
was: 123456789ABCDEF

9. Added Common and Independent damper configurations along with a Combustion Air Damper 10 minute retry

10. DHW Protection now has an adjustable time period: 60, 90, 120 minutes

11. Calibration Menu text changes: MIN BTU and MAX BTU, was MINIMUM and MAX OUT

12. Expanded 4-20mA functionality – The 4-20mA setpoint can now be mapped by the user

13. Added 4-20mA Priority – The 4-20mA input can be optionally selected to be the Highest priority

14. Flow Prove time is now adjustable – 10 – 240s, was fixed at 10s

15. CSD1 Firmware Available – Special versions of the firmware can be made to be CSD1 compliant with a manual reset High Limit, a manual reset Ignition Lockout, and a single trial for ignition.

16. Miscellaneous Local Pump Fixes:

    Fixed an issue where the Master might not turn off its local pump when it stopped firing until all boilers were off.

    Fixed an issue where a member could not retry on lose of flow

Revision 1.2.1 Release 14-May-2008

1. Corrected an issue that if a boiler was a MASTER, it could fail blower prove because the PWM would not stay constant, it would switch between PURGE and MIN due to the MOD DELAY & MASTER settings

Revision 1.2 Release 10-April-2008

1. Blower is now proven with TACH Feedback in PRE-PURGE. Once the Pre-Purge state is entered the blower has 10 seconds to reach the Pre-Purge RPM level. If it does not, the control will go into FAULT, displaying “BLOWER FAIL”. If the demand is still present the control will retry ignition in 60 minutes.

2. New DHW PROTECTION feature added, accessed under AUX FUNTIONS menu. When this feature is enabled, if there is a DHW demand that lasts more than 60 minutes, the control will go into FAULT, displaying “DHW DISABLE”, the DHW input is disabled and the control will only respond to other calls for heat. This fault can only be cleared by power cycling the unit.

3. Adjusting the MAX OUT setting no longer affects the PURGE and IGNITION values.

4. Miscellaneous spark noise defense updates:

5. Watchdog now only reset in NEWKEY.,WAIT1 and UPDATE_DISPLAY, it was called in COMM functions and Interrupts which prevented it from ever resetting.

6. Ignition State machine updated so we are only sparking in PILOT State and are running in MAIN_VALVE state.

7. Added a Timer in the ignition state machine to force a reset if the spark noise caused problems with the control/display. WDT did not always catch some scenarios.

8. Menu_MeterDisplay will now not allow exit if in the PILOT state to try to avoid spark issues

Revision 1.1 Release 16-January-2008

1. Added a 60 minute retry on Ignition Lockout.

2. Min Hold (Modulation delay) no longer effects DHW demands

3. Bypass pump time now 1 minute, was 2 minutes

4. MAX OUT and DHW MAX now go to 125% for altitude adjustments. This gives access to the full output if the blower.

5. Pre-Start routine no longer called while the Bypass pump is on. This gave artificial readings since the Bypass could cause the temperature to drop quickly.

6. Overhauled log to show blower flag, ignition, MV, damper, pump, and bypass along with MOD %

7. Miscellaneous Text and Default settings changes:
   "LOC" is now "LCL" designating "Local Setpoint"
   Default Pump post purge time is now 0s
   Default LOCAL SETPOINT is now 180
   Default OP LIMIT now 205
   Default OP LIMIT BAND 10

Revision 1.0a Release 13-November-2007

1. Once the control decides to fire the boiler it does not look at the Heat Demand signals until it has fired to completion. Once the boiler has fired successfully, or failed an attempt, the control decides to keep it running or shut it down. If the call for heat was lost during the 10 second VALVE proof it would register as a misfire, which could cause false lockouts.

2. If OA sensor is lost, and OA RESET is in use, the boiler will revert back to the local setpoint and still operate on Heat Demands.

Revision 1.0 Release 11-October-2007
Initial Production Release