Input/Output Variables (Read/Write)

<table>
<tr><th>Name</th><th>SNVT Type/Index</th><th>Description</th><th>Valid Values/Range</th></tr>
<tr><td>nviHeatDemand</td><td>SNVT_switch
100</td><td>Heat Demand/Request. Setting the state member of this variable will put the boiler in heating mode.</td><td><table><tr><th>state</th><th>value</th><th>Interpretation</th></tr><tr><td>0</td><td>0</td><td>no heat demand</td></tr><tr><td>0</td><td>>0</td><td>heat demand</td></tr><tr><td>1</td><td>any</td><td>heat demand</td></tr></table></td></tr>
<tr><td>nviSetpointTimer</td><td>SNVT_count
101</td><td>System Setpoint Timer

The system setpoint timer is a BMS failsafe feature. This countdown timer should be periodically reloaded with a timeout value (in seconds). If the timer reaches zero, the control assumes that the BMS is no longer operating and the local setpoint (saved on the control) is reloaded. This is a failsafe feature used to help safeguard the system in case of BMS failure.

When any (1) Read/Write variable is timer is written, if the SetpointTimer is less than 60, it is automatically reloaded with 60.

(1) In control firmware versions < 3.38, the BMS has to write the SystemSetpoint to automatically reload the SetpointTimer.</td><td>0 – 65535 seconds</td></tr>
<tr><td>nviSetpoint</td><td>SNVT_temp_p
102</td><td>System Setpoint (see nviSetpointTimer)</td><td>4.5 – 104.4 °C (40 - 220 °F)</td></tr>
<tr><td>nviOAResetEnable</td><td>SNVT_switch
103</td><td>Enables/Disables outdoor air reset mode.</td><td><table><tr><th>state</th><th>value</th><th>interpretation</th></tr><tr><td>0</td><td>0</td><td>disabled</td></tr><tr><td>0</td><td>>0</td><td>enabled</td></tr><tr><td>1</td><td>any</td><td>enabled</td></tr></table></td></tr>
<tr><td>nviOARSetpoint</td><td>SNVT_temp_p
104</td><td>Outdoor air reset setpoint. Temperature at which boiler shuts down.</td><td>4.5 – 37.8 °C (40 – 100 °F)</td></tr>
<tr><td>nviOARHiWtrTemp</td><td>SNVT_temp_p
105</td><td>Boiler water temperature setpoint when outdoor air temperature is at the high outdoor air temperature setpoint (nviOARHiAirTemp).</td><td>15.6 – 87.8 °C (60 – 190 °F)</td></tr>
<tr><td>nviOARHiAirTemp</td><td>SNVT_temp_p
106</td><td>High outdoor air temperature setpoint.</td><td>10 – 32.2 °C (50 – 90 °F)</td></tr>
<tr><td>nviOARLoWtrTemp</td><td>SNVT_temp_p
107</td><td>Header/Supply temperature setpoint when outdoor air temperature is at the low outdoor air temperature setpoint (nviOARLoAirTemp).</td><td>21.1 – 104.4 °C (70 – 220 °F)</td></tr>
</table>

<table>
<tr><th>Name</th><th>SNVT Type/Index</th><th>Description</th><th>Valid Values/Range</th></tr>
<tr><td>nviOARLoAirTemp</td><td>SNVT_temp_p
108</td><td>Low outdoor air temperature setpoint.</td><td>-37.2 – 4.4 °C (-35 – 40 °F)</td></tr>
<tr><td>nviSetMonth</td><td>SNVT_count
109</td><td>Set real time clock – month (see nviSetClock)</td><td>0 (January) – 11 (December)</td></tr>
<tr><td>nviSetDay</td><td>SNVT_count
110</td><td>Set real time clock – day (see nviSetClock)</td><td>1 – 31</td></tr>
<tr><td>nviSetYear</td><td>SNVT_count
111</td><td>Set real time clock – year (see nviSetClock)</td><td>0 – 99</td></tr>
<tr><td>nviSetHour</td><td>SNVT_count
112</td><td>Set real time clock – hour (see nviSetClock)</td><td>0 – 23</td></tr>
<tr><td>nviSetMinute</td><td>SNVT_count
113</td><td>Set real time clock – minute (see nviSetClock)</td><td>0 – 59</td></tr>
<tr><td>nviSetSecond</td><td>SNVT_count
114</td><td>Set real time clock – second (see nviSetClock)</td><td>0 – 59</td></tr>
<tr><td>nviSetWeekday</td><td>SNVT_count
115</td><td>Set real time clock – weekday (see nviSetClock)</td><td>1 (Monday) – 7 (Sunday)</td></tr>
<tr><td>nviSetClock</td><td>SNVT_switch
116</td><td>Set (write) the real time clock.

To write the real time clock, the system variables (nviSetMonth, nviSetMonth, nviSetDay, nviSetYear, nviSetHour, nviSetMinute, nviSetSecond, nviSetWeekday) must first be loaded with the correct date and time. Then, a 1 must be written to the state portion of this system variable to write the new date and time to the system clock.</td><td><table><tr><th>state</th><th>value</th><th>interpretation</th></tr><tr><td>0</td><td>0</td><td>---</td></tr><tr><td>0</td><td>>0</td><td>set the clock</td></tr><tr><td>1</td><td>any</td><td>set the clock</td></tr></table></td></tr>
<tr><td colspan="4">--- The following are supported bridge configuration versions 2.50 and greater ---
(HeatNet control firmware version 3.38 or greater required)</td></tr>
<tr><td>nviDHWSetpoint</td><td>SNVT_temp_p
117</td><td>DHW Setpoint</td><td>4.4 – 93.3 °C (40 – 200 °F)</td></tr>
</table>

Input Variables (Read Only)

Name	SNVT Type/Index	Description	Valid Values/Range
nvoBoilersOn	SNVT_count 200	The number of boilers currently running.	0 – 16
nvoModulation	SNVT_lev_cont_f 201	Current system (target) modulation level. This is the modulation level that the system is trying to run at to meet the heating demand.	0 – 100 %
nvoHeaderTemp	SNVT_temp_p 202	Header / System temperature.	0 – 121.1 °C (32 – 250 °F)
nvoSupplyTemp	SNVT_temp_p 203	Supply temperature.	0 – 121.1 °C (32 – 250 °F)
nvoReturnTemp	SNVT_temp_p 204	Return temperature.	0 – 121.1 °C (32 – 250 °F)
nvoOutsideTemp	SNVT_temp_p 205	Outside air temperature.	-40 – 121.1 °C (-40 – 250 °F)
nvoSpare1	SNVT_count 206	Raw A/D value from spare 1 input.	-32768 to 32767
nvoSpare2	SNVT_count 207	Raw A/D value from spare 2 input.	-32768 to 32767
nvoMonth	SNVT_count 208	Real time clock month.	0 (January) – 11 (December)
nvoDay	SNVT_count 209	Real time clock day.	1 – 31
nvoYear	SNVT_count 210	Real time clock year.	0 – 99
nvoHour	SNVT_count 211	Real time clock hour.	0 – 23
nvoMinute	SNVT_count 212	Real time clock minute.	0 – 59
nvoSecond	SNVT_count 213	Real time clock second.	0 – 59
nvoWeekday	SNVT_count 214	Real time clock weekday.	1 (Monday) - 7 (Sunday)

Name	SNVT Type/Index	Description	Valid Values/Range
nvoClock	SNVT_time_stamp 215	Real time clock date and time.	0 – 11
nvoBlr01Status1 … nvoBlr16Status1	SNVT_state 300 302 304 … 328 330 (Even Indices)	Boiler status flags #1 (boilers 1 – 16). These bits indicate the state of the 24VAC interlocks, ignition circuit, and various other conditions.	See Appendix A for more information.
nvoBlr01Status2 … nvoBlr16Status2	SNVT_state 301 303 305 … 329 331 (Odd Indices)	Boiler status flags #2 (boilers 1 – 16).). These bits indicate the state of the ignition circuit, sensors, and various other conditions.	See Appendix A for more information.
nvoBlr01Status3 … nvoBlr16Status3	SNVT_state 400 … 415	Boiler stage control input flags. These bits indicate the state of the stage control inputs.	See Appendix A for more information.
nvoBlr01Runtime … nvoBlr16Runtime	SNVT_reg_val 500 … 515	The total number of minutes that the boiler has been running (with the current control board).	0 – 35791394 minutes
nvoBlr01Cycles … nvoBlr16Cycles	SNVT_reg_val 600 … 615	The total number of boiler cycles (with the current control board).	0 – 2147483647 cycles
--- The following are supported bridge configuration versions 2.20 and greater ---			
nvoBlr01Supply … nvoBlr16Supply	SNVT_temp_p 616 … 631	The boiler supply (outlet) temperature.	0 – 121.1 °C (32 – 250 °F)

Name	SNVT Type/Index	Description	Valid Values/Range
nvoBlr01Return … nvoBlr16Return	SNVT_temp_p 632 … 647	The boiler return (inlet) temperature.	0 – 121.1 °C (32 – 250 °F)
--- The following are supported bridge configuration versions 2.50 and greater --- (HeatNet control firmware version 3.38 or greater required)			
nvoBlr01Status4 … nvoBlr16Status4	SNVT_state 648 … 663	Boiler (1 – 16) status4 flags. These bits indicate the state of various boiler statuses.	See Appendix A for more information.
nvoBlr01DHW … nvoBlr16DHW	SNVT_temp_p 664 … 679	Boiler (1 – 16) DHW temperature (if available). See Boiler Status4 to determine if the sensor is present.	0 – 121.1 °C (32 – 250 °F)
nvoBlr01Modulate … nvoBlr16Modulate	SNVT_lev_cont_f 680 … 695	The running (“display”) modulation. This is typically the actual running modulation except under special circumstances when the boiler is running in a self-protection mode (Op. Limit, ½ Fire Rate, etc.)	0 – 100 %
nvoOpSetpoint	SNVT_temp_p 696	This is the current operating or active setpoint. It may be: 1) The normal heating setpoint. 2) The DHW setpoint if running in DHW mode. 3) A calculated setpoint if running in Outdoor Air Reset Mode 4) The 4-20ma (0-10V) setpoint.	4.5 – 104.4 °C (40 - 220 °F)
nvoStackTemp	SNVT_temp_p 697	Stack temperature. Available only on PVC firmware version.	-46.1 – 132.7 °C (-51 – 271 °F)

APPENDIX A – Status Flags

BoilerStatus1 Flags

Bit	Description	Valid Values/Range
0	Disabled Boiler is disabled. For example, when minimum off time has not been met.	0 = enabled, 1 = disabled
1	Local Override (member boilers only)	0 = no override, 1 =override
2	Alarm An alarm or warning condition has occurred. An attempt(s) will automatically be made to recover and resume normal operation.	0 = ok, 1 = alarm
3	Failed A condition has occurred under which the boiler can no longer run.	0 = ok, 1 = failed
4	Member Error An “Alarm” or “Failed” condition has occurred on one (or more) of the member boilers.	0 = ok, 1 = error
5	Boiler Running	0 = off, 1 = on (running)
6	Local Pump Running	0 = off, 1 = on (running)
7	System Water Prove (Flow) Interlock. This input was previously called “Spare 3”.	0 = open, 1 = closed
8	LWCO Interlock (Low Water Cut Off)	0 = open, 1 = closed
9	VFD Interlock (Variable Frequency Drive)	0 = open, 1 = closed
10	Gas Prove Interlock	0 = open, 1 = closed
11	Spare 4 (User) Interlock	0 = open, 1 = closed
12	Operator Interlock	0 = open, 1 = closed
13	Local Water Prove (Flow) Interlock	0 = open, 1 = closed
14	UV Sensor Air Prove Interlock	0 = open, 1 = closed
15	Main Valve	0 = closed, 1 = open

BoilerStatus2 Flags

Bit	Description	Valid Values/Range
0	Pilot Valve	0 = closed, 1 = open
1	Blower Running	0 = off, 1 = on (running)
2	Ignition Alarm	0 = ok, 1 = alarm
3	IRI Alarm	0 = ok, 1 = alarm
4	High Limit	0 = ok, 1 = tripped
5	Air Prove Switch	0 = proven, 1 = not proven
6	---	---
7	Software Operator Tripped	0 = not tripped, 1 = tripped
8	Header Sensor not detected	0 = detected, 1 = not detected
9	Supply Sensor not detected	0 = detected, 1 = not detected
10	Return Sensor not detected	0 = detected, 1 = not detected
11	Outside Sensor not detected	0 = detected, 1 = not detected
12	System Pump Running	0 = off, 1 = on (running)
13	Combustion Air Damper Prove (J10B). Obsolete – available only on revision 1.x controls.	0 = not proven, 1 = proven
14	Master Boiler	0 = member, 1 = master
15	Boiler Detected A boiler was detected at this address.	0 = not detected, 1 = detected

BoilerStatus3 Flags

Bit	Description	Valid Values/Range
0	AA High Fire Input	0 = off, 1 = on
1	Heat Demand Input (Local Override)	0 = off, 1 = on
2	4-20ma Remote Enable Input	0 = off, 1 = on
3	Outdoor Air Reset Override Input	0 = off, 1 = on
4	T1 Input	0 = off, 1 = on
5	T2 Input	0 = off, 1 = on
6	T3 Input	0 = off, 1 = on
7	T4 Input	0 = off, 1 = on
8	---	---
9	---	---
10	---	---
11	---	---
12	---	---
13	---	---
14	---	---
15	---	---

BoilerStatus4 Flags

Bit	Description	Valid Values/Range
0	DHW Enabled (1) DHW Mode had been enabled in the menus.	0 = off, 1 = on (menu)
1	Combustion Air Damper Prove (1) Status of Damper Prove Input J12B	0 = not proven, 1 = proven
2	Call Service Fault (1)	0 = ok, 1 = fault
3	Air Switch (Blower Fault) (1)	0 = ok, 1 = fault
4	---	---
5	---	---
6	---	---
7	---	---
8	---	---
9	DHW Sensor not detected (1)	0 = detected, 1 = not detected
10	DHW Boiler (1) This control board has been designated a DHW boiler by cutting the DHW jumper (JPS1).	0 = no, 1 = yes (DHW jumper cut)
11	Operating Limit Clamp (1) Boiler input is being limited (clamped) due to a high supply (outlet) temperature.	0 = off, 1 = clamped
12	---	---
13	---	---
14	---	---
15	---	---

(1) Available in Firmware Version 3.38+ and Bridge Configuration 2.30+.