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 and system setpoint work in tandem to externally control (i.e. a BMS - building management system) the operating setpoint. The setpoint (countdown) timer should be loaded with a timeout value (in seconds) prior to writing the system setpoint. When 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. If the setpoint timer is not written, a default timeout value of 60 seconds is assumed.</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>
<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>
</table>

<table>
<tr><th>Name</th><th>SNVT Type/Index</th><th>Description</th><th>Valid Values/Range</th></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 in bridge configurations 2.30 and greater ---
(Control firmware version 2.70 or greater required)</td></tr>
<tr><td>nviDHWSetpoint</td><td>SNVT_temp_p
117</td><td>DHW Setpoint Temperature</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. These flags indicate the state of the 24VAC interlocks, ignition circuit, and various other conditions.	See BoilerStatus1 Flags in the Appendix for a list of flags and values.
nvoBlr01Status2 … nvoBlr16Status2	SNVT_state 301 303 305 … 329 331 (Odd Indices)	Boiler status flags #2. These flags indicate the state of the ignition circuit, sensors, and various other conditions.	See BoilerStatus2 Flags in the Appendix for a list of flags and values.
nvoBlr01Status3 … nvoBlr16Status3	SNVT_state 400 … 415	Boiler status flags #3. These flags indicate the state of the stage control inputs.	See BoilerStatus3 Flags in the Appendix for a list of flags and values.
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 in 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 in bridge configurations 2.30 and greater --- (Control firmware version 2.70 or greater required)			
nvoBlr01Status4 … nvoBlr16Status4	SNVT_state 648 … 663	Boiler status flags #3. These flags indicate the state of various conditions.	See BoilerStatus4 Flags in the Appendix for a list of flags and values.
nvoBlr01DHW … nvoBlr16DHW	SNVT_temp_p 664 … 679	DHW Temperature.	0 – 121.1 °C (32 – 250 °F)
nvoBlr01Modulate … nvoBlr16Modulate	SNVT_level_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)

APPENDIX A – Status Flags

BoilerStatus1 Flags

Bit	Description	Valid Values/Range
0	Disabled Boiler is disabled.	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	Pump Running	0 = off, 1 = on (running)
7	---	---
8	---	---
9	---	---
10	---	---
11	Spare 4 (User) Interlock	0 = open, 1 = closed
12	---	---
13	Water Prove (Flow) Interlock	0 = not proven, 1 = proven
14	---	---
15	Main Valve	0 = closed, 1 = open

BoilerStatus2 Flags

Bit	Description	Valid Values/Range
0	---	---
1	Blower Running	0 = off, 1 = on (running)
2	Ignition Alarm	0 = ok, 1 = alarm
3	---	---
4	High Limit	0 = ok, 1 = tripped
5	---	---
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	---	---
13	Combustion Air Damper Prove.	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	---	---
4	---	---
5	---	---
6	---	---
7	---	---
8	---	---
9	---	---
10	---	---
11	---	---
12	---	---
13	---	---
14	---	---
15	---	---

BoilerStatus4 Flags

Bit	Description	Valid Values/Range
0	DHW Sensor Enabled DHW Sensor has been enabled in the menus.	0 = off, 1 = on (menu)
1	Combustion Air Damper Prove.	0 = not proved, 1 = proven
2	---	---
3	Blower Fault	0 = ok, 1 = fault
4	Blocked Inlet	0 = off, 1 = fault
5	Blocked Flue	0 = ok, 1 = blocked
6	DHW Input	0 = off, 1 = on
7	Low Fire Input	0 = off, 1 = on
8	DHW Fault	0 = ok, 1 = fault
9	DHW Sensor not detected	0 = detected, 1 = not detected
10	---	---
11	Operating Limit Clamp Boiler input is being limited (clamped) due to a high supply (outlet) temperature.	0 = off, 1 = clamped
12	---	---
13	---	---
14	---	---
15	---	---