

# DNP Points List and Implementation

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## Introduction

These instructions provide Distributed Network Protocol (DNP) points and DNP implementation information for an IntelliCap 2000 Automatic Capacitor Control and were prepared for use with software version **IC2000Installer-2.1.x** or subsequent releases. The “x” can indicate any number from 0 to 255.

For accessing the IntelliCap 2000 Automatic Capacitor Control, the DNP master station should define the control with the following **Status**, **Analog Input**, **Analog Output**, **Binary Counter**, **Frozen Counter**, and **Control** points:

<b>Point</b>	<b>Count</b>
<b>Status</b>	41
<b>Analog Input</b>	56
<b>Analog Output</b>	190
<b>Binary Counter</b>	4
<b>Frozen Counter</b>	4
<b>Control</b>	42

The available DNP points are listed in Tables 1 through 8 on pages 2 through 28 in the same order they are presented for selection on the *Setup>Point Mapping* screens. **Status**, **Analog Input**, and **Control** points can be assigned to any SCADA DNP point index. Point descriptions begin with a code number used to find the detailed definition in this instruction sheet. The code number is not the SCADA point index.

For a specific SCADA system, typically all IntelliCap 2000 Automatic Capacitor Controls operate with the same DNP point index configuration.

Unless otherwise noted, each point is on if the condition is logically true or active.



## Status Points

**Table 1. Status Points**

Code #	Name—Definition
0	<b>Capacitor Bank Open</b> —On if the capacitor bank is switched out.
1	<b>Capacitor Bank Closed</b> —On if the capacitor bank is switched in.
2	<b>Auto/Manual Operation</b> —On when the control is in the <b>Automatic</b> mode.
3	<b>Remote/Local Control Mode</b> —On when the control is in the <b>Remote</b> state. In the <b>Local</b> state, operation of the bank from the SCADA master station is blocked.
4	<b>Alarm Summary</b> —On when an <b>Alarm</b> or <b>Trouble</b> state occurs. This is a summary point; the exact cause of the alarm can be determined from inspection of the <i>Diagnostics&gt;Alarms</i> screen.
5	<b>Warning Summary</b> —On when a <b>Warning</b> state occurs. This is a summary point; the exact cause of the warning can be determined from inspection of the <i>Diagnostics&gt;Warnings</i> screen.
6	<b>Error Summary</b> —On when an <b>Error</b> state occurs. This is a summary point; the exact cause of the error can be determined from inspection of the <i>Diagnostics&gt;Errors</i> screen.
7	<b>SCADA Override Enabled</b> —On when the <b>SCADA Override</b> mode is enabled in the setup software. This override strategy may or may not be controlling the bank state when enabled, depending on the state of other overrides and issued SCADA commands.
8	<b>Over Voltage</b> —On when the <b>High-Voltage Override</b> state is present for the active season strategy.
9	<b>Under Voltage</b> —On when the <b>Low-Voltage Override</b> state is present for the active season strategy.
10	<b>Emergency Voltage Override</b> —On when the voltage has exceeded the <b>Emergency Voltage Override</b> setpoints.
11	<b>Reclose Block</b> —On for a period of five minutes after a <b>Trip</b> state to allow the capacitors to discharge fully. During this five-minute period, the bank is prevented from closing.
12	<b>Maximum Daily Cycles</b> —On when the number of <b>Open</b> operations of the capacitor bank reaches the daily maximum limit configured in the setup software. Further automatic operations are prevented until the alarm is cleared. If the <b>Maximum Daily Cycles</b> setpoint has been reached, this alarm will clear automatically at midnight, or it can be manually cleared at any time.
13	<b>Load Fuse Blown</b> —On when ac voltage is not detected by the control. If the control is communicating, it indicates that the load fuse is probably blown.  A blown load fuse will be alarmed by all wiring options except “-J67.” For “-J67,” any type of station power, even dc, could be used as wetting voltage, so the sensing input is wired to control power and will not go off if the load fuse is blown. For all other wiring options, the sensing input is wired to the load side of the load fuse, and the alarm will be set for a blown load fuse.
14	<b>Temperature Sensor Error</b> —On if an error has been detected in the temperature sensor.
15	<b>Temperature System Fahrenheit</b> —On if temperature is reported in °F; off if temperature is reported in °C.
16	<b>Incorrect Voltage Range</b> —On if an error has been detected in the voltage sensor.
17	<b>Low Switching Voltage Delta</b> —On if the delta voltage measured during the present switching operation is lower than the average of the last four switching operations by the percentage configured in the setup software.
18	<b>Neutral Sensor Option</b> —On if the neutral sensor option is present; cleared if no neutral sensor option is installed.
19	<b>Neutral Sensor Configuration</b> —On if the neutral sensor measures voltage; off if the neutral sensor measures current. <b>Note:</b> Versions without the <b>Neutral</b> option will return a 0 value.

TABLE CONTINUED ►

Table 1. Status Points—Continued

Code #	Name—Definition
20	<p><b>Neutral Sensor Lockout</b>—On when neutral current remains above the <b>Neutral Current Alarm Level</b> setting for a period of time specified by the <b>Current Change Time Threshold</b> setting. When the <b>Corrective Action</b> and <b>Neutral Current Retry</b> modes are enabled in the setup software, and this point is set, the <b>Retry</b> operation was unsuccessful. This alarm prevents further operation of the capacitor bank by any other automatic means. To reset, issue Control Point 3, <b>Reset Neutral Lockout</b>.</p> <p><b>Note:</b> Versions without the <b>Neutral</b> option will return a 0 value.</p>
21	<p><b>Continuous Neutral Sensor</b>—On when the neutral current remains above the <b>Neutral Current Alarm Level</b> setting for a period of time specified by the <b>Neutral Current Change Time Threshold</b> setting. It is reset if the neutral current falls below the <b>Neutral Current Alarm Level</b> setting after the <b>Retry</b> operation (when a <b>Retry</b> operation is enabled).</p> <p><b>Note:</b> Versions without the <b>Neutral</b> option will return a 0 value.</p>
22	<p><b>Zero Neutral Sensor</b>—This is a user-selectable option. When enabled in the setup software, this point is set if the neutral sensor is detecting zero neutral current or voltage, indicating a possible problem with the neutral sensor or cabling. This only applies when the bank is switched in.</p> <p><b>Note:</b> Versions without the <b>Neutral</b> option will return a 0 value.</p>
23	<p><b>Var Option</b>—On if the <b>Var</b> option is present; off when no <b>Var</b> option is installed.</p>
24	<p><b>Current Direction</b>—On if the control detected the direction of current flow is reversed from the normal direction. This should only occur during emergency switching operations.</p> <p><b>Note:</b> Versions without the <b>Var</b> option will return a 0 value.</p>
25	<p><b>Low Switching Var Delta</b>—On if the delta var measured during the present switching operation is lower than the average of the last four switching operations by the percentage configured in the setup software.</p> <p><b>Note:</b> Versions without the <b>Var</b> option will return a 0 value.</p>
26	<p><b>Neutral Alarm on Total RMS</b>—This point is off when neutral sensor alarming is based on fundamental RMS measurements using only the 60-Hz component of the neutral voltage or neutral current. This point is on when the total RMS measurement is the basis for this alarm.</p> <p><b>Note:</b> Versions without the <b>Neutral</b> option will return a 0 value.</p>
27	<p><b>Current Sensor Load Side</b>—On when the current sensor is installed on the load side of the bank.</p>
28	<p><b>Automatic Calculations Enabled</b>—On when automatic calculations are used.</p>
29	<p><b>Cabinet Door Installed and Open</b>—On when the optional door-position indication is enabled and the enclosure door is open.</p>
30	<p><b>User Defined Input</b>—On when the optional user-defined input is enabled and active.</p>
31	<p><b>Operation Inhibit</b>—On when:</p> <ol style="list-style-type: none"> <li>1. The voltage is between <b>BVC+M</b> value and the <b>Low-Voltage Override</b> setpoint</li> <li>2. The voltage is between <b>BVC+M</b> value and the <b>High-Voltage Override</b> setpoint</li> <li>3. Automatic operations are inhibited because of user input</li> <li>4. Automatic operations are inhibited because of a digital switch position issue</li> <li>5. There is a <b>SCADA Inhibit Automatic Operation</b> command</li> </ol> <p><b>Note:</b> BVC+M = Bank Voltage Change + Margin.</p>
32	<p><b>Wi-Fi Connected</b>—On when Wi-Fi is connected.</p>
33	<p><b>Wi-Fi Intrusion Alarm</b>—On when a Wi-Fi intrusion attempt is detected.</p>
34	<p><b>Wi-Fi Disabled from SCADA</b>—On when Wi-Fi is disabled.</p>
35	<p><b>Settings Rejected</b>—On when an invalid Analog Output point is received.</p>

TABLE CONTINUED ►

## Status Points

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**Table 1. Status Points—Continued**

Code #	Name—Definition
36	<b>Harmonic Distortion Alarm</b> —On when voltage, neutral, or current harmonics exceed the configured alarm threshold for the <b>Harmonic Distortion Alarm Threshold Time</b> setpoint; otherwise, off. Only the individual harmonics selected for logging are monitored for an alarm condition.
37	<b>Base Component on Total RMS</b> —On when Total RMS is the basis for the values the control measures and compares. Off when the <b>Base Component</b> setpoint selects Fundamental RMS measurements.
38	<b>Three-Phase Reporting</b> —On when the <b>Three-Phase Reporting</b> mode is selected; off when <b>Single-Phase Reporting</b> mode is selected.
39	<b>SCADA Override Refresh Mode Message Received</b> —On when a SCADA Override Refresh message is received; off when the <b>SCADA Override Refresh</b> mode is in the <b>Operate-Inhibit</b> state.
40	<b>Selected Power Factor Convention is IEEE</b> —On when the <b>IEEE</b> option is the selected <b>Power Factor Sign Convention</b> setpoint; off when the <b>IEC</b> option is the selected convention setpoint.

Table 2. Analog Input Points

Code #	Name—Definition
0	<b>Voltage Reference Standard 90%</b> —This is provided for the benefit of protocol implementation to conform to the remote terminal unit (RTU) standard. It is loaded as a constant. The value returned is 24300.
1	<b>Voltage Reference Standard 0%</b> —This is provided for the benefit of protocol implementation to conform to the RTU standard. It is loaded as a constant with the value zero.
2	<p><b>Control Strategy</b>—This is the presently configured control strategy in use. The possible values are:</p> <ol style="list-style-type: none"> <li>0. <b>Temperature</b></li> <li>1. <b>Timeclock</b></li> <li>2. <b>Voltage Only</b></li> <li>3. <b>Time-Biased Voltage</b></li> <li>4. <b>Time-Biased Temperature</b></li> <li>5. <b>Auto Offline Mode</b></li> <li>6. <b>Auto Online Mode</b></li> <li>7. <b>Current</b></li> <li>8. <b>Var</b></li> <li>9. <b>Reverse Current Voltage Only</b></li> <li>10. <b>Temperature Sensor Error, Voltage Only</b></li> <li>11. <b>SCADA Override</b></li> <li>12. <b>Timeclock with Temperature Override</b></li> <li>13. <b>Current with Temperature Override</b></li> <li>14. <b>Var with Temperature Override</b></li> <li>15. <b>Manual Operation</b></li> <li>16. <b>Reserved</b></li> <li>17. <b>Voltage Override</b></li> <li>18. <b>Reverse Current Trip Inhibit</b></li> </ol> <p><b>Note:</b> Values 7, 8, 13, 14, and 18 do not apply to controls without a <b>Var</b> option.</p>
3	<b>Temperature Fahrenheit</b> —This is the most recent temperature reading, in units of °F.
4	<b>Temperature Centigrade</b> —This is the most recent temperature reading, units of °C.
5	<b>Secondary Voltage</b> —This is the most recent secondary voltage measurement. Each count equals 0.1 Vac RMS.
6	<p><b>Primary Voltage</b>—Each count equals 10 Vac RMS.</p> <p><b>Note:</b> Controls without a <b>Var</b> option return a 0 value.</p>
7	<b>SCADA Override Remaining Time</b> —When in <b>Timed</b> mode, this is the number of minutes remaining. In the <b>Latched</b> mode, 255 is always returned.
8	<p><b>Neutral Fundamental RMS</b>—The data reported represent the fundamental harmonic RMS value. Each count equals 1 ampere for a control with neutral current sensing installed or each count equals 1 Volt for a control with neutral voltage sensing installed.</p> <p><b>Note:</b> Versions without the <b>Neutral</b> option will return a 0 value.</p>
9	<p><b>Single-Phase Line Current</b>—Each count equals 1 ampere.</p> <p><b>Note:</b> Versions without the <b>Var</b> option will return a 0 value.</p>
10	<p><b>Corrected Phase Angle</b>—This is the <b>Uncorrected Phase Angle</b> value modified by the <b>Voltage Sensor Phase Shift Correction</b> and the <b>Phase Angle Offset</b> setpoint. (Range: –180 to +180 degrees; Step: one-eighth degree) Each count = one-eighth degree. For example: –180° = –1440 counts, 0° = 0 counts, +108° = +1440 counts.</p> <p><b>Note:</b> Standard controls without the <b>Var</b> option will return a 0 value.</p>

TABLE CONTINUED ►

## Analog Input Points

**Table 2. Analog Input Points—Continued**

Code #	Name—Definition
11	<b>Three-Phase Kvars</b> —Kvars (volt-amperes, reactive) are calculated from the measured single-phase voltage, current, and phase angles times three. Each count equals 1 kvar. <b>Note:</b> Versions without the <b>Var</b> option will return a -30000 value.
12	<b>Three-Phase kVA</b> —The <b>Single-Phase kVA</b> value is multiplied by three. <b>Note:</b> Versions without the <b>Var</b> option will return a 0 value.
13	<b>Three-Phase kW</b> —The single-phase <b>kW</b> value is multiplied by three. <b>Note:</b> Versions without the <b>Var</b> option will return a 0 value.
14	<b>Voltage Total Harmonic (Distortion)</b> —In units of 0.1%.
15	<b>Voltage Third Harmonic (Distortion)</b> —In units of 0.1%.
16	<b>Voltage Fifth Harmonic (Distortion)</b> —In units of 0.1%.
17	<b>Voltage Seventh Harmonic (Distortion)</b> —In units of 0.1%.
18	<b>Current Total Harmonic (Distortion)</b> —In units of 0.1%. <b>Note:</b> Versions without the <b>Var</b> option will return a 0 value.
19	<b>Current Third Harmonic (Distortion)</b> —In units of 0.1%. <b>Note:</b> Versions without the <b>Var</b> option will return a 0 value.
20	<b>Current Fifth Harmonic (Distortion)</b> —In units of 0.1%. <b>Note:</b> Versions without the <b>Var</b> option will return a 0 value.
21	<b>Current Seventh Harmonic (Distortion)</b> —In units of 0.1%. <b>Note:</b> Versions without the <b>Var</b> option will return a 0 value.
22	<b>Neutral Total Harmonic (Distortion)</b> —In units of 0.1%. <b>Note:</b> Versions without the <b>Neutral</b> option will return a 0 value.
23	<b>Neutral Third Harmonic (Distortion)</b> —In units of 0.1%. <b>Note:</b> Versions without the <b>Neutral</b> option will return a 0 value.
24	<b>Neutral Fifth Harmonic Distortion</b> —In units of 0.1%. <b>Note:</b> Versions without the <b>Neutral</b> option will return a 0 value.
25	<b>Neutral Seventh Harmonic (Distortion)</b> —In units of 0.1%. <b>Note:</b> Versions without the <b>Neutral</b> option will return a 0 value.
26	<b>Voltage Delta</b> —Each count is 0.1 Volt. This is a signed value when the voltage after switching is less than the voltage before switching.
27	<b>Neutral Total RMS</b> —The data reported is the total true neutral voltage or neutral current RMS value. The sensor type determines whether neutral current or neutral voltage is reported. Each count equals 1 ampere for a control with neutral current sensing installed, or each count equals 1 Volt for a control with neutral voltage sensing installed. <b>Note:</b> Versions without the <b>Neutral</b> option will return a 0 value.
28	<b>Kvar Delta</b> —Each count equals 1 kvar. When the control is set to <b>Single-Phase Reporting</b> mode the <b>Kvar Delta</b> value will be for a single-phase change. When the control is set to <b>Three-Phase Reporting</b> mode the <b>Kvar Delta</b> value will be for a three-phase change. <b>Note:</b> Versions without the <b>Var</b> option will return a 0 value.

TABLE CONTINUED ►

Table 2. Analog Input Points—Continued

Code #	Name—Definition
29	<p><b>Last Switch (Operation) Reason</b>—The possible values are:</p> <ol style="list-style-type: none"> <li>1. Manual Operation</li> <li>2. Reserved</li> <li>3. Voltage Override</li> <li>4. Reverse Current Inhibit</li> <li>5. Neutral Voltage or Current Corrective</li> <li>6. Temperature</li> <li>7. Timeclock</li> <li>8. Voltage</li> <li>9. Reserved</li> <li>10. Time Biased Temperature</li> <li>11. Auto Offline</li> <li>12. Auto Online</li> <li>13. Current</li> <li>14. Var Mode</li> <li>15. Reserved</li> <li>16. Reserved</li> <li>17. SCADA Override</li> <li>18. Temperature Override Time Clock Strategy</li> <li>19. Temperature Override Current Strategy</li> <li>20. Temperature Override Var Strategy</li> <li>21. Reserved</li> <li>22. Reserved</li> <li>23. Trip on Loss of Voltage</li> <li>24. User Defined Input</li> <li>25. Inconsistent Bank Position</li> <li>26. Contradictory Bank Position</li> <li>27. Holiday</li> </ol> <p><b>Note:</b> Values 13, 14, 19, and 20 do not apply to versions without the <b>Var</b> option.</p>
30	<b>Voltage Ninth Harmonic (Distortion)</b> —In units of 0.1%.
31	<b>Current Ninth Harmonic (Distortion)</b> —In units of 0.1%. <b>Note:</b> Versions without the <b>Var</b> option will return a 0 value.
32	<b>Neutral, % Ninth Harmonic (Distortion)</b> —In units of 0.1%. <b>Note:</b> Versions without the <b>Neutral</b> option will return a 0 value.
33	<b>Three-Phase Bank Size</b> —In units of 1 kvar per count. <b>Note:</b> Versions without the <b>Var</b> option will return a 0 value.
34	<p><b>Power Factor</b>—This is based on the cosine of the <b>Corrected Phase Angle</b> value. Each count equals 0.001 with a 1000 offset (0 = -1.000 PF, 1000 = 0.000 PF, 2000 = 1.000 PF). The sign is determined by the <b>Power Factor Sign Convention</b> setpoint on the <i>Setup&gt;General&gt;Site-Related</i> screen.</p> <ul style="list-style-type: none"> <li>• IEEE convention: Negative value for quadrants 1 &amp; 3, positive value for quadrants 2 &amp; 4.</li> <li>• IEC convention: Negative value for quadrants 2 &amp; 3, positive value for quadrants 1 &amp; 4.</li> </ul> <p><b>Note:</b> Quadrants are shown in the “Site-Related” section of Instruction Sheet 1024-530.</p>

TABLE CONTINUED ►

## Analog Input Points

**Table 2. Analog Input Points—Continued**

Code #	Name—Definition
35	<b>Number of Seasons Configured</b>
36	<b>Voltage Eleventh Harmonic (Distortion)</b> —In units of 0.1%.
37	<b>Voltage Thirteenth Harmonic (Distortion)</b> —In units of 0.1%.
38	<b>Voltage Fifteenth Harmonic (Distortion)</b> —In units of 0.1%.
39	<b>Voltage Seventeenth Harmonic (Distortion)</b> —In units of 0.1%.
40	<b>Voltage Nineteenth Harmonic (Distortion)</b> —In units of 0.1%.
41	<b>Voltage Twenty-first Harmonic (Distortion)</b> —In units of 0.1%.
42	<b>Voltage Twenty-third Harmonic (Distortion)</b> —In units of 0.1%.
43	<b>Current Eleventh Harmonic (Distortion)</b> —In units of 0.1%.
44	<b>Current Thirteenth Harmonic (Distortion)</b> —In units of 0.1%.
45	<b>Current Fifteenth Harmonic (Distortion)</b> —In units of 0.1%.
46	<b>Current Seventeenth Harmonic (Distortion)</b> —In units of 0.1%.
47	<b>Current Nineteenth Harmonic (Distortion)</b> —In units of 0.1%.
48	<b>Total Cycles Since Installation</b>
49	<b>Total Cycles this Year</b>
50	<b>Active Season</b> —This is the active season specified by calendar settings and seasons enabled.
51	<b>View Rejected Setting</b> —This specifies the number of the last Analog Input point with an invalid setting reported by the <b>Settings Rejected</b> Status Point. When there are no rejected settings this point will display -1.
52	<b>Bank Voltage Change + Margin Value in Use</b> —This specifies the current <b>Bank Voltage Change + Margin</b> value in use, whether estimated or calculated. Maximum value constrained to 10% of the <b>Nominal Operating Voltage</b> setting. Minimum setting constrained to 0.5 V.
53	<b>View Settings Value</b> —Used in conjunction with the <b>Settings to View</b> Analog Output point. Set the point number of the analog output point which you are interested in for the <b>Settings to View</b> Analog Output point. Use this point to view its present value.
54	<b>Daily Automatic Cycles</b> —This is the total number of automatic cycles completed that day and is incremented when the bank is switched out. The count includes SCADA commands but excludes manual operations.
55	<b>SCADA Override Status</b> —This number indicates status: 0 = <b>Disabled</b> , 1 = <b>Inactive</b> , 2 = <b>Latched</b> , 3 = <b>Timed Override</b> .



**Note:** An Analog Output Point message sent with an invalid value, either because of being out of range or because it is in conflict with other settings, will result in a return message with a status code other than 0 (success).

**Table 3. Analog Output Points**

Code #	Name—Definition
0	<b>Reverse Current Detection Level</b> —This is the amount of current flow in the reverse direction required for the control to detect the reverse current condition. The current must persist at or above this level continuously for the <b>Reverse Current Time Threshold</b> setting before the control applies the <b>Reverse Current</b> strategy. (Range: 1 to 10 Amps; Step: 1 Amp; Default: 6 Amps)
1	<b>SCADA Override Timer</b> —The setting range is latched, or 1 to 1440 minutes (24 Hrs) in 1-minute increments. Set this to 65535 to enable the <b>Latched</b> state. When set to the <b>Latched</b> state, the value returned is -1.
2	<b>High Voltage SCADA Override</b> —This is the maximum voltage setting, and it is constrained by the <b>Emergency High-Voltage Override</b> setting. The setting is entered in 0.1-Volt increments.
3	<b>Low Voltage SCADA Override</b> —This is the minimum voltage setting, and it is constrained by the <b>Emergency Low-Voltage Override</b> setting. The setting is entered in 0.1-Volt increments.
4	<b>Max Auto Cycles Per Day</b> —In <b>Automatic</b> mode, the bank switch can be operated this number of times per day. Further <b>Automatic</b> mode switching is inhibited until the next calendar day. The count is incremented when the bank switch is opened. Normal overrides apply. (Range: 0 - 255)
5	<b>Emergency High Voltage Value</b> —This is the maximum voltage setting before the the <b>Automatic</b> mode is overridden and the bank switch is opened to avoid an excessive <b>High-Voltage</b> condition. It is differentiated from the <b>Season Override</b> setting by a significantly shorter time threshold. The maximum setting is constrained to 19% of the nominal operating voltage. (Nominal Operation Voltage + 19%).
6	<b>Emergency High Voltage Time</b> —This is the time, in seconds, voltage must continuously be above the <b>Emergency High Voltage Override</b> setpoint before the bank switch is opened. (Range: 0.1 - 30.0)
7	<b>Emergency Low Voltage Value</b> —This is the minimum voltage before the the <b>Automatic</b> mode is overridden and the bank switch is closed to avoid an excessive <b>Undervoltage</b> condition. It is differentiated from the <b>Season Override</b> setting by a significantly shorter time threshold. The maximum setting is constrained to 19% of the nominal operating voltage. (Nominal Operation Voltage - 19%)
8	<b>Emergency Low Voltage Time</b> —This is the time, in seconds, voltage must continuously be below the <b>Emergency Low Voltage Override</b> setpoint before the bank switch is closed. (Range: 0.1 - 30.0)
9	<b>Bank Voltage Change + Margin</b> —(BVC+M) This is the estimated voltage change associated with opening and closing the the bank switch, plus a small margin. The margin is 0.5 Volts or 25% of the change amount, whichever is larger. The estimated value cannot exceed 10% of the nominal operating voltage.
10	<b>Capacitor Bank Min Switch Voltage</b> —This is the minimum voltage necessary for the bank switch to operate. (Increment: 0.1-Volt)
11	<b>Min % Delta V</b> —This the minimum percentage of the <b>BVC+M</b> value that the voltage is expected to change when the capacitor bank switch is opened or closed. A warning is generated when the change is less than this amount. (Range: 0-99%; increment: 1%)
12	<b>Min % Delta kvars</b> —This the minimum percentage of the <b>BVC+M</b> value, expressed in kvars, the kvars are expected to change when the capacitor bank switch is opened or closed. A warning is generated when the change is less than this amount. (Range: 0-99%; increment: 1%)
13	<b>Capacitor Bank Pulse Time</b> —This is the amount of time, in seconds, the Open and Close output signals are energized. This time is determined by the manufacturer of the bank switch. This can be set to the <b>Latched</b> setting, or from 0.1 - 60.0.

TABLE CONTINUED ►

## Analog Output Points

**Table 3. Analog Output Points—Continued**

Code #	Name—Definition
14	<b>SCADA Use Voltage Overrides</b> —This sets one of the the following <b>Voltage Override</b> settings: <b>No</b> , specified by a setting of 0; <b>As Voltage Override</b> , specified by a setting of 1; and the <b>As Voltage</b> setpoint, specified by a setting of 2. <b>No</b> : Use the <b>Season Voltage Override</b> settings. The <b>SCADA Override</b> mode is not deactivated by a <b>Voltage Override</b> condition. <b>As Voltage Override</b> : Use the <b>SCADA Override Voltage and Time Threshold</b> settings. <b>SCADA Override</b> mode is deactivated if a <b>Voltage Override</b> condition occurs. <b>As Voltage</b> setpoint: Use the <b>SCADA Override Voltage and Time Threshold</b> settings. <b>SCADA Override</b> mode is not deactivated as a result of a <b>Voltage Override</b> condition.
15	<b>High Voltage SCADA Time Threshold</b> —The setting range is 0.1 - 180.0 seconds.
16	<b>Low Voltage SCADA Time Threshold</b> —The setting range is 0.1 - 180.0 seconds.
17	<b>Inhibit Duration</b> —This is the time <b>Automatic Operation</b> mode is inhibited after a <b>Voltage Override</b> operation occurs. (Range: 1-1440; Step: 1 minute; Default: 60)
18	<b>High-/Low-Voltage Band Lockout Retry Delay Time Value</b> —This is the configurable time setting to allow a retry of the <b>BVC+M Value in Use</b> value to the <b>Estimated Value</b> setpoint and is a reset of the automatic calculation buffer, allowing normal operation to resume control of the bank after a <b>Voltage Band Lockout</b> error occurred. When set to the <b>None</b> setting, the <b>BVC+M Value in Use</b> value and the automatic calculation buffer will not be reset by this feature. (Range: None, 1 to 96; Step: 1; Default: None)
19	<b>High-/Low-Voltage Band Lockout Retry Delay Time Units</b> —This determines whether the value is minutes or hours for the <b>High-/Low-Voltage Band Lockout Retry Delay Time Value</b> setting. (Default: hours)
20	<b>Season 1 Month</b> —This is the month Season 1 operation begins. The settings are 1 - 12.
21	<b>Season 1 Day</b> —This is the day Season 1 operation begins. The settings are 1 - 7.
22	<b>Season 1 Timeclock Strategy Schedule 1 - Start Day</b> —This is the first day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 1 of the active <b>Season 1</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
23	<b>Season 1 Timeclock Strategy Schedule 1 - End Day</b> —This is the last day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 1 of the active <b>Season 1</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
24	<b>Season 1 Timeclock Strategy Schedule 1 - Start Time Hours</b> —This is the hour on each scheduled active day the active period begins. The settings are 0 - 23. Applies to Schedule 1 of the active <b>Season 1</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
25	<b>Season 1 Timeclock Strategy Schedule 1 - Start Time Minutes</b> —This is the minute on each scheduled active day the active period begins. The settings are 0 - 59. Applies to Schedule 1 of the active <b>Season 1</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
26	<b>Season 1 Timeclock Strategy Schedule 1 - End Time Hours</b> —This is the hour on each scheduled active day the active period ends. The settings are 0 - 23. Applies to Schedule 1 of the active <b>Season 1</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
27	<b>Season 1 Timeclock Strategy Schedule 1 - End Time Minutes</b> —This is the minute on each scheduled active day the active period ends. The settings are 0 - 59. Applies to Schedule 1 of the active <b>Season 1</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
28	<b>Season 1 Timeclock Strategy Schedule 2 - Start Day</b> —This is the first day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 2 of the active <b>Season 1</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
29	<b>Season 1 Timeclock Strategy Schedule 2 - End Day</b> —This is the last day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 2 of the active <b>Season 1</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .

TABLE CONTINUED ►

Table 3. Analog Output Points—Continued

Code #	Name—Definition
30	<b>Season 1 Timeclock Strategy Schedule 2 - Start Time Hours</b> —This is the hour on each scheduled active day the active period begins. The settings are 0 - 23. Applies to Schedule 2 of the active <b>Season 1</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
31	<b>Season 1 Timeclock Strategy Schedule 2 - Start Time Minutes</b> —This is the minute on each scheduled active day the active period begins. The settings are 0 - 59. Applies to Schedule 2 of the active <b>Season 1</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
32	<b>Season 1 Timeclock Strategy Schedule 2 - End Time Hours</b> —This is the hour on each scheduled active day the active period ends. The settings are 0 - 23. Applies to <b>Schedule 2</b> of the active <b>Season 1</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
33	<b>Season 1 Timeclock Strategy Schedule 2 - End Time Minutes</b> —This is the minute on each scheduled active day the active period ends. The settings are 0 - 59. Applies to Schedule 2 of the active <b>Season 1</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
34	<b>Season 1 Strategy</b> —This sets the control strategy used by Season 1. The available strategies are: 1. <b>Temperature</b> 2. <b>Timeclock</b> 3. <b>Voltage Only</b> 4. <b>Time-Biased Voltage</b> 5. <b>Time-Biased Temperature</b> 6. <b>Automatic Offline</b> 7. <b>Automatic Online</b> 8. <b>Current</b> 9. <b>Var</b> 10. <b>Timeclock + Temperature Override</b> 11. <b>Current + Temperature Override</b> 12. <b>Var + Temperature Override</b>
35	<b>Season 1 High-Voltage Override Value</b> —This is the voltage at which the <b>Season Strategy</b> automatic operation is overridden to open the bank switch. The setting must be less than the <b>Emergency High-Voltage Override</b> value and greater than the <b>Low-Voltage Override</b> value. The setting is entered in 0.1-Volt increments.
36	<b>Season 1 High-Voltage Override Time</b> —This is the amount of time the voltage must be continuously above the <b>Override</b> value to be considered valid. The setting range is 0.1 - 900.0 seconds.
37	<b>Season 1 Low-Voltage Override Value</b> —This is the voltage at which the <b>Season Strategy</b> automatic operation is overridden to close the bank switch. The setting must be greater than the <b>Emergency Low-Voltage Override</b> value and less than the <b>High-Voltage Override</b> value. The setting is entered in 0.1-Volt increments.
38	<b>Season 1 Low-Voltage Override Time</b> —This is the amount of time the voltage must be continuously below the <b>Override</b> value to be considered valid. The setting range is 0.1 - 900.0 seconds.
39	<b>Season 1 Temperature Strategy - High-Temp Switches In</b> —The bank switch is closed when the temperature is continuously above this value for the <b>High-/Low-Temperature Time Threshold</b> time. The <b>High-Temp Switch In</b> setting must be greater than the <b>High-Temp Switch Out</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).

TABLE CONTINUED ►

## Analog Output Points

**Table 3. Analog Output Points—Continued**

Code #	Name—Definition
40	<b>Season 1 Temperature Strategy - High-Temp Switches Out</b> —The bank switch is opened when the temperature is continuously below this value for the <b>High-/Low-Temperature Time Threshold</b> time. The <b>High-Temp Switch Out</b> setting must be less than the <b>High-Temp Switch In</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
41	<b>Season 1 Temperature Strategy - Low-Temp Switches In</b> —The bank switch is closed when the temperature is continuously below this value for the <b>High-/Low-Temperature Time Threshold</b> time. The <b>Low-Temp Switch In</b> setting must be less than the <b>Low-Temp Switch Out</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
42	<b>Season 1 Temperature Strategy - Low-Temp Switches Out</b> —The bank switch is opened when the temperature is continuously above this value for the <b>High-/Low-Temperature Time Threshold</b> time. The <b>Low-Temp Switch Out</b> setting must be greater than the <b>Low-Temp Switch In</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
43	<b>Season 1 Voltage Only - Preferred Position</b> —Settings are: <b>None</b> , specified by a setting of 0; <b>Online</b> , specified by a setting of 1; and <b>Offline</b> , specified by a setting of 2. <b>None</b> : The bank switch does not change positions after a <b>Voltage Override</b> condition clears. <b>Online</b> : The bank switch is closed after a <b>Voltage Override</b> condition clears. <b>Offline</b> : The bank switch is opened after a <b>Voltage Override</b> condition clears.
44	<b>Season 1 Time-Biased Voltage - Active High Voltage</b> —This is the voltage at which the bank switch is opened during the scheduled active time period. The voltage must remain above this value for the <b>High-/Low-Voltage Time Threshold</b> time to be considered valid.
45	<b>Season 1 Time-Biased Voltage - Active Low Voltage</b> —This is the voltage at which the bank switch is closed during the scheduled active time period. The voltage must remain below this value for the <b>High-/Low-Voltage Time Threshold</b> time to be considered valid.
46	<b>Season 1 Time-Biased Voltage - Inactive High Voltage</b> —This is the voltage at which the bank switch is opened during the scheduled inactive time period. The voltage must remain above this value for the <b>High-/Low-Voltage Time Threshold</b> time to be considered valid.
47	<b>Season 1 Time-Biased Voltage - Inactive Low Voltage</b> —This is the voltage at which the bank switch is closed during the scheduled inactive time period. The voltage must remain below this value for the <b>High-/Low-Voltage Time Threshold</b> time to be considered valid.
48	<b>Season 1 Time-Biased Voltage - High-/Low-Voltage Time</b> —This is the amount of time the voltage must be continuously above or below the specified setting to be considered valid. (Range: 0.1 - 900.0)
49	<b>Season 1 Time-Biased Voltage - Behavior for Inactive Periods</b> —When the <b>Use Voltage Setpoints</b> mode is selected (default), the voltage settings for the inactive periods are followed. When the <b>Offline</b> mode is selected, the voltage setpoints are ignored and the bank is taken offline.
50	<b>Season 1 Time-Biased Temperature - Switch In</b> —The bank switch is closed when the temperature is continuously above this value for the <b>High-/Low-Temperature Time</b> value. The <b>Switch In</b> setting must be greater than the <b>Switch Out</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
51	<b>Season 1 Time-Biased Temperature - Switch Out</b> —The bank switch is opened when the temperature is continuously below this value for the <b>High-/Low-Temperature Time</b> value. The <b>Switch Out</b> setting must be less than the <b>Switch In</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
52	<b>Season 1 Time-Biased Temperature - High-/Low-Temperature Time</b> —This is the amount of time the temperature must be continuously above or below the specified setting to be considered valid. (Range: 2-180; Increment: 1 minute)
53	<b>Season 1 Current - Amps Bank In</b> —The bank switch is closed when the current is continuously above this value for the <b>Time Threshold</b> time. The <b>Amps Bank In</b> setting must be greater than the <b>Amps Bank Out</b> setting. (Range: 0.0-2550.0 Amps)

TABLE CONTINUED ►

Table 3. Analog Output Points—Continued

Code #	Name—Definition
54	<b>Season 1 Current - Amps Bank Out</b> —The bank switch is opened when the current is continuously below this value for the <b>Time Threshold</b> time. The <b>Amps Bank Out</b> setting must be less than the <b>Amps Bank In</b> setting. (Range: 0.0-2550.0 Amps)
55	<b>Season 1 Current - Time Threshold</b> —This is the amount of time the current must be continuously above or below the specified setting to be considered valid. (Range: 0.1-900.0 seconds)
56	<b>Season 1 Vars - Vars Bank In</b> —The bank switch is closed when the vars are continuously above this value for the <b>Time Threshold</b> time. The <b>Vars Bank In</b> setting must be greater than the <b>Vars Bank Out</b> setting. (Range: -327680-327680 vars)
57	<b>Season 1 Vars - Vars Bank Out</b> —The bank switch is opened when the vars are continuously below this value for the <b>Time Threshold</b> time. The <b>Vars Bank Out</b> setting must be less than the <b>Vars Bank In</b> setting. (Range: -327680-327680 vars)
58	<b>Season 1 Vars - Time Threshold</b> —This is the amount of time the vars must be continuously above or below the specified setting to be considered valid. (Range: 0.1-900.0 seconds)
59	<b>Season 1 Temperature High/Low Threshold</b> —This is the amount of time, in minutes, the temperature must be continuously outside the normal temperature range before a switching operation occurs. (Range: 2-180; Step: 1; Default: 10)
60	<b>Season 2 Month</b> —This is the month Season 2 operation begins. The settings are 1 - 12.
61	<b>Season 2 Day</b> —This is the day Season 2 operation begins. The settings are 1 - 7.
62	<b>Season 2 Timeclock Strategy Schedule 1 - Start Day</b> —This is the first day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 1 of the active <b>Season 2</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
63	<b>Season 2 Timeclock Strategy Schedule 1 - End Day</b> —This is the last day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 1 of the active <b>Season 2</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
64	<b>Season 2 Timeclock Strategy Schedule 1 - Start Time Hours</b> —This is the hour on each scheduled active day the active period begins. The settings are 0 - 23. Applies to Schedule 1 of the active <b>Season 2</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
65	<b>Season 2 Timeclock Strategy Schedule 1 - Start Time Minutes</b> —This is the minute on each scheduled active day the active period begins. The settings are 0 - 59. Applies to Schedule 1 of the active <b>Season 2</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
66	<b>Season 2 Timeclock Strategy Schedule 1 - End Time Hours</b> —This is the hour on each scheduled active day the active period ends. The settings are 0 - 23. Applies to Schedule 1 of the active <b>Season 2</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
67	<b>Season 2 Timeclock Strategy Schedule 1 - End Time Minutes</b> —This is the minute on each scheduled active day the active period ends. The settings are 0 - 59. Applies to Schedule 1 of the active <b>Season 2</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
68	<b>Season 2 Timeclock Strategy Schedule 2 - Start Day</b> —This is the first day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 2 of the active <b>Season 2</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
69	<b>Season 2 Timeclock Strategy Schedule 2 - End Day</b> —This is the last day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 2 of the active <b>Season 2</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .

TABLE CONTINUED ►



## Analog Output Points

**Table 3. Analog Output Points—Continued**

Code #	Name—Definition
70	<b>Season 2 Timeclock Strategy Schedule 2 - Start Time Hours</b> —This is the hour on each scheduled active day the active period begins. The settings are 0 - 23. Applies to Schedule 2 of the active <b>Season 2</b> strategy when the strategy is: <b>Timeclock, Time-Biased Voltage, Time-Biased Temperature, or Timeclock + Temperature Override.</b>
71	<b>Season 2 Timeclock Strategy Schedule 2 - Start Time Minutes</b> —This is the minute on each scheduled active day the active period begins. The settings are 0 - 59. Applies to Schedule 2 of the active <b>Season 2</b> strategy when the strategy is: <b>Timeclock, Time-Biased Voltage, Time-Biased Temperature, or Timeclock + Temperature Override.</b>
72	<b>Season 2 Timeclock Strategy Schedule 2 - End Time Hours</b> —This is the hour on each scheduled active day the active period ends. The settings are 0 - 23. Applies to Schedule 2 of the active <b>Season 2</b> strategy when the strategy is: <b>Timeclock, Time-Biased Voltage, Time-Biased Temperature, or Timeclock + Temperature Override.</b>
73	<b>Season 2 Timeclock Strategy Schedule 2 - End Time Minutes</b> —This is the minute on each scheduled active day the active period ends. The settings are 0 - 59. Applies to Schedule 2 of the active <b>Season 2</b> strategy when the strategy is: <b>Timeclock, Time-Biased Voltage, Time-Biased Temperature, or Timeclock + Temperature Override.</b>
74	<b>Season 2 Strategy</b> —This sets the control strategy used by Season 2. The available strategies are: <ol style="list-style-type: none"> <li>1. <b>Temperature</b></li> <li>2. <b>Timeclock</b></li> <li>3. <b>Voltage Only</b></li> <li>4. <b>Time-Biased Voltage</b></li> <li>5. <b>Time-Biased Temperature</b></li> <li>6. <b>Automatic Offline</b></li> <li>7. <b>Automatic Online</b></li> <li>8. <b>Current</b></li> <li>9. <b>Var</b></li> <li>10. <b>Timeclock + Temperature Override</b></li> <li>11. <b>Current + Temperature Override</b></li> <li>12. <b>Var + Temperature Override</b></li> </ol>
75	<b>Season 2 High-Voltage Override Value</b> —This is the voltage at which the season strategy <b>Automatic Operation</b> is overridden to open the bank switch. The setting must be less than the <b>Emergency High-Voltage Override</b> value and greater than the <b>Low-Voltage Override</b> value. The setting is entered in 0.1-Volt increments.
76	<b>Season 2 High-Voltage Override Time</b> —This is the amount of time the voltage must be continuously above the <b>Override</b> value to be considered valid. (Range: 0.1-900.0 seconds)
77	<b>Season 2 Low-Voltage Override Value</b> —This is the voltage at which the season strategy <b>Automatic Operation</b> is overridden to close the bank switch. The setting must be greater than the <b>Emergency Low-Voltage Override</b> value and less than the <b>High-Voltage Override</b> value. The setting is entered in 0.1-Volt increments.
78	<b>Season 2 Low-Voltage Override Time</b> —The amount of time the voltage must be continuously below the <b>Override</b> value to be considered valid. (Range: 0.1-900.0 seconds)
79	<b>Season 2 Temperature Strategy - High-Temp Switches In</b> —The bank switch is closed when the temperature is continuously above this value for the <b>High-/Low-Temperature Time Threshold</b> time. The <b>High-Temp Switch In</b> setting must be greater than the <b>High-Temp Switch Out</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
80	<b>Season 2 Temperature Strategy - High-Temp Switches Out</b> —The bank switch is opened when the temperature is continuously below this value for the <b>High-/Low-Temperature Time Threshold</b> time. The <b>High-Temp Switch Out</b> setting must be less than the <b>High-Temp Switch In</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).

TABLE CONTINUED ►

Table 3. Analog Output Points—Continued

Code #	Name—Definition
81	<b>Season 2 Temperature Strategy - Low-Temp Switches In</b> —The bank switch is closed when the temperature is continuously below this value for the <b>High-/Low-Temperature Time Threshold</b> time. The <b>Low-Temp Switch In</b> setting must be less than the <b>Low-Temp Switch Out</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
82	<b>Season 2 Temperature Strategy - Low-Temp Switches Out</b> —The bank switch is opened when the temperature is continuously above this value for the <b>High-/Low-Temperature Time Threshold</b> time. The <b>Low-Temp Switch Out</b> setting must be greater than the <b>Low-Temp Switch In</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
83	<b>Season 2 Voltage Only (strategy) - Preferred Position</b> —Settings are: <b>None</b> , specified by a setting of 0; <b>Online</b> , specified by a setting of 1; and <b>Offline</b> , specified by a setting of 2. <b>None</b> : The bank switch does not change positions after a <b>Voltage Override</b> condition clears. <b>Online</b> : The bank switch is closed after a <b>Voltage Override</b> condition clears. <b>Offline</b> : The bank switch is opened after a <b>Voltage Override</b> condition clears.
84	<b>Season 2 Time-Biased Voltage (strategy) - Active High Voltage</b> —This is the voltage at which the bank switch is opened during the scheduled active time period. The voltage must remain above this value for the <b>High-/Low-Voltage Time Threshold</b> time to be considered valid.
85	<b>Season 2 Time-Biased Voltage (strategy) - Active Low Voltage</b> —This is the voltage at which the bank switch is closed during the scheduled active time period. The voltage must remain below this value for the <b>High-/Low-Voltage Time Threshold</b> time to be considered valid.
86	<b>Season 2 Time-Biased Voltage (strategy) - Inactive High Voltage</b> —This is the voltage at which the bank switch is opened during the scheduled inactive time period. The voltage must remain above this value for the <b>High-/Low-Voltage Time Threshold</b> time to be considered valid.
87	<b>Season 2 Time-Biased Voltage (strategy) - Inactive Low Voltage</b> —This is the voltage at which the bank switch is closed during the scheduled inactive time period. The voltage must remain below this value for the <b>High-/Low-Voltage Time Threshold</b> time to be considered valid.
88	<b>Season 2 Time-Biased Voltage (strategy) - High-/Low-Voltage Time</b> —This is the amount of time the voltage must be continuously above or below the specified setting to be considered valid. The setting range is 0.1 - 900.0 seconds.
89	<b>Season 2 Time-Biased Voltage (strategy) - Behavior for Inactive Periods</b> —When the <b>Use Voltage Setpoints</b> mode is selected (default), the voltage settings for the inactive periods are followed. When the <b>Offline</b> mode is selected, the voltage setpoints are ignored and the bank is taken offline.
90	<b>Season 2 Time-Biased Temperature - Switch In</b> —The bank switch is closed when the temperature is continuously above this value for the <b>High-/Low-Temperature Time</b> setting. The <b>Switch In</b> setting must be greater than the <b>Switch Out</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
91	<b>Season 2 Time-Biased Temperature - Switch Out</b> —The bank switch is opened when the temperature is continuously below this value for the <b>High-/Low-Temperature Time</b> setting. The <b>Switch Out</b> setting must be less than the <b>Switch In</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
92	<b>Season 2 Time-Biased Temperature - High-/Low-Temperature Time</b> —This is the amount of time the temperature must be continuously above or below the specified setting to be considered valid. (Range: 2-180; Increment: 1 minute)
93	<b>Season 2 Current - Amps Bank In</b> —The bank switch is closed when the current is continuously above this value for the <b>Time Threshold</b> time. The <b>Amps Bank In</b> setting must be greater than the <b>Amps Bank Out</b> setting. (Range: 0.0-2550.0 amps)
94	<b>Season 2 Current - Amps Bank Out</b> —The bank switch is opened when the current is continuously below this value for the <b>Time-Threshold</b> time. The <b>Amps Bank Out</b> setting must be less than the <b>Amps Bank In</b> setting. (Range: 0.0-2550.0 amps)
95	<b>Season 2 Current - Time Threshold</b> —This is the amount of time the current must be continuously above or below the specified setting to be considered valid. (Range: 0.1-900.0 seconds)

TABLE CONTINUED ►

## Analog Output Points

**Table 3. Analog Output Points—Continued**

Code #	Name—Definition
96	<b>Season 2 Vars - Vars Bank In</b> —The bank switch is closed when vars is continuously above this value for the <b>Time-Threshold</b> time. The <b>Vars Bank In</b> setting must be greater than the <b>Vars Bank Out</b> setting. (Range: -327680-327680 vars)
97	<b>Season 2 Vars - Vars Bank Out</b> —The bank switch is opened when vars is continuously below this value for the <b>Time-Threshold</b> time. The <b>Vars Bank Out</b> setting must be less than the <b>Vars Bank In</b> setting. (Range: -327680-327680 vars)
98	<b>Season 2 Vars - Time Threshold</b> —The amount of time vars must be continuously above or below the specified setting to be considered valid. (Range: 0.1-900.0 seconds)
99	<b>Season 2 Temperature High/Low Threshold</b> —This is the amount of time, in minutes, the temperature must be continuously outside the normal temperature range before a switching operation occurs. (Range: 2-180; Step: 1; Default: 10)
100	<b>Season 3 Month</b> —This is the month Season 3 operation begins. The settings are 1 - 12.
101	<b>Season 3 Day</b> —This is the day Season 3 operation begins. The settings are 1 - 7.
102	<b>Season 3 Timeclock Strategy Schedule 1 - Start Day</b> —This is the first day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 1 of the active <b>Season 3</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
103	<b>Season 3 Timeclock Strategy Schedule 1 - End Day</b> —This is the last day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 1 of the active <b>Season 3</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
104	<b>Season 3 Timeclock Strategy Schedule 1 - Start Time Hours</b> —This is the hour on each scheduled active day that the active period begins. The settings are 0 - 23. Applies to Schedule 1 of the active <b>Season 3</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
105	<b>Season 3 Timeclock Strategy Schedule 1 - Start Time Minutes</b> —This is the minute on each scheduled active day that the active period begins. The settings are 0 - 59. Applies to Schedule 1 of the active <b>Season 3</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
106	<b>Season 3 Timeclock Strategy Schedule 1 - End Time Hours</b> —This is the hour on each scheduled active day that the active period ends. The settings are 0 - 23. Applies to Schedule 1 of the active <b>Season 3</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
107	<b>Season 3 Timeclock Strategy Schedule 1 - End Time Minutes</b> —This is the minute on each scheduled active day that the active period ends. The settings are 0 - 59. Applies to Schedule 1 of the active <b>Season 3</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
108	<b>Season 3 Timeclock Strategy Schedule 2 - Start Day</b> —This is the first day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 2 of the active <b>Season 3</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
109	<b>Season 3 Timeclock Strategy Schedule 2 - End Day</b> —This is the last day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 2 of the active <b>Season 3</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
110	<b>Season 3 Timeclock Strategy Schedule 2 - Start Time Hours</b> —This is the hour on each scheduled active day the active period begins. The settings are 0 - 23. Applies to Schedule 2 of the active <b>Season 3</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
111	<b>Season 3 Timeclock Strategy Schedule 2 - Start Time Minutes</b> —This is the minute on each scheduled active day the active period begins. The settings are 0 - 59. Applies to Schedule 2 of the active <b>Season 3</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .

TABLE CONTINUED ►



Table 3. Analog Output Points—Continued

Code #	Name—Definition
112	<b>Season 3 Timeclock Strategy Schedule 2 - End Time Hours</b> —This is the hour on each scheduled active day the active period ends. The settings are 0 - 23. Applies to Schedule 2 of the active <b>Season 3</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
113	<b>Season 3 Timeclock Strategy Schedule 2 - End Time Minutes</b> —This is the minute on each scheduled active day the active period ends. The settings are 0 - 59. Applies to Schedule 2 of the active <b>Season 3</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
114	Season 3 Strategy—This sets the control strategy used by Season 3. The available strategies are: 1. <b>Temperature</b> 2. <b>Timeclock</b> 3. <b>Voltage Only</b> 4. <b>Time-Biased Voltage</b> 5. <b>Time-Biased Temperature</b> 6. <b>Automatic Offline</b> 7. <b>Automatic Online</b> 8. <b>Current</b> 9. <b>Var</b> 10. <b>Timeclock + Temperature Override</b> 11. <b>Current + Temperature Override</b> 12. <b>Var+ Temperature Override</b>
115	<b>Season 3 High-Voltage Override Value</b> —This is the voltage at which the Season strategy <b>Automatic Operation</b> is overridden to open the bank switch. The setting must be less than the <b>Emergency High-Voltage Override</b> value and greater than the <b>Low-Voltage Override</b> value. The setting is entered in 0.1 volt increments.
116	<b>Season 3 High-Voltage Override Time</b> —This is the amount of time the voltage must be continuously above the <b>High-Voltage Override</b> value to be considered valid. (Range: 0.1-900.0 seconds)
117	<b>Season 3 Low-Voltage Override Value</b> —This is the voltage at which the Season strategy <b>Automatic Operation</b> is overridden to close the bank switch. The setting must be greater than the <b>Emergency Low-Voltage Override</b> value and less than the <b>High-Voltage Override</b> value. The setting is entered in 0.1-Volt increments.
118	<b>Season 3 Low-Voltage Override Time</b> —This is the amount of time the voltage must be continuously below the <b>Low Voltage Override</b> value to be considered valid. (Range: 0.1-900.0 seconds)
119	<b>Season 3 Temperature Strategy - High-Temp Switches In</b> —The bank switch is closed when the temperature is continuously above this value for the <b>High-/Low-Temperature Time</b> threshold time. The <b>High-Temp Switch In</b> setting must be greater than the <b>High-Temp Switch Out</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
120	<b>Season 3 Temperature Strategy - High Temp Switches Out</b> —The bank switch is opened when the temperature is continuously below this value for the <b>High-/Low-Temperature Time</b> threshold time. The <b>High-Temp Switch Out</b> setting must be less than the <b>High-Temp Switch In</b> setting. The setting can only be set in degrees C. The setting range is from -45 to 66 degrees C (-49 to 151 degrees F).
121	<b>Season 3 Temperature Strategy - Low-Temp Switches In</b> —The bank switch is closed when the temperature is continuously below this value for the <b>High-/Low-Temperature Time</b> threshold time. The <b>Low-Temp Switch In</b> setting must be less than the <b>Low-Temp Switch Out</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).

TABLE CONTINUED ►

## Analog Output Points

**Table 3. Analog Output Points—Continued**

Code #	Name—Definition
122	<b>Season 3 Temperature Strategy - Low-Temp Switches Out</b> —The bank switch is opened when the temperature is continuously above this value for the <b>High-/Low-Temperature Time</b> threshold time. The <b>Low-Temp Switch Out</b> setting must be greater than the <b>Low-Temp Switch In</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
123	<b>Season 3 Voltage Only (strategy) - Preferred Position</b> —Settings are: <b>None</b> , specified by a setting of 0; <b>Online</b> , specified by a setting of 1; and <b>Offline</b> , specified by a setting of 2. <b>None</b> : The bank switch does not change positions after a <b>Voltage Override</b> condition clears. <b>Online</b> : The bank switch is closed after a <b>Voltage Override</b> condition clears. <b>Offline</b> : The bank switch is opened after a <b>Voltage Override</b> condition clears.
124	<b>Season 3 Time-Biased Voltage (strategy) - Active High Voltage</b> —This is the voltage at which the bank switch is opened during the scheduled active time period. The voltage must remain above this value for the <b>High-/Low-Voltage Time</b> threshold time to be considered valid.
125	<b>Season 3 Time-Biased Voltage (strategy) - Active Low Voltage</b> —This is the voltage at which the bank switch is closed during the scheduled active time period. The voltage must remain below this value for the <b>High-/Low-Voltage Time</b> threshold time to be considered valid.
126	<b>Season 3 Time-Biased Voltage (strategy) - Inactive High Voltage</b> —This is the voltage at which the bank switch is opened during the scheduled inactive time period. The voltage must remain above this value for the <b>High-/Low-Voltage Time</b> threshold time to be considered valid.
127	<b>Season 3 Time-Biased Voltage (strategy) - Inactive Low Voltage</b> —This is the voltage at which the bank switch is closed during the scheduled inactive time period. The voltage must remain below this value for the <b>High-/Low-Voltage Time</b> threshold time to be considered valid.
128	<b>Season 3 Time-Biased Voltage (strategy) - High-/Low-Voltage Time</b> —This is the amount of time the voltage must be continuously above or below the specified setting to be considered valid. (Range: 0.1-900.0 seconds)
129	<b>Season 3 Time-Biased Voltage (strategy) - Behavior for Inactive Periods</b> —When the <b>Use Voltage Setpoints</b> mode is selected (default), the voltage settings for the inactive periods are followed. When the <b>Offline</b> mode is selected, the voltage setpoints are ignored and the bank is taken offline.
130	<b>Season 3 Time-Biased Temperature - Switch In</b> —The bank switch is closed when the temperature is continuously above this value for the <b>High-/Low-Temperature Time</b> value. The <b>Switch In</b> setting must be greater than the <b>Switch Out</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
131	<b>Season 3 Time-Biased Temperature - Switch Out</b> —The bank switch is opened when the temperature is continuously below this value for the <b>High-/Low-Temperature Time</b> value. The <b>Switch Out</b> setting must be less than the <b>Switch In</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
132	<b>Season 3 Time-Biased Temperature - High-/Low-Temperature Time</b> —This is the amount of time the temperature must be continuously above or below the specified setting to be considered valid. (Range: 2-180; Increment: 1 minute)
133	<b>Season 3 Current - Amps Bank In</b> —The bank switch is closed when the current is continuously above this value for the <b>Current-Time Threshold</b> time. The <b>Amps Bank In</b> setting must be greater than the <b>Amps Bank Out</b> setting. (Range: 0.0-2550.0 amps)
134	<b>Season 3 Current - Amps Bank Out</b> —The bank switch is opened when the current is continuously below this value for the <b>Current-Time Threshold</b> time. The <b>Amps Bank Out</b> setting must be less than the <b>Amps Bank In</b> setting. Range: 0.0-2550.0 amps)
135	<b>Season 3 Current - Time Threshold</b> —This is the amount of time the current must be continuously above or below the specified setting to be considered valid. (Range: 0.1-900.0 seconds)
136	<b>Season 3 Vars - Vars Bank In</b> —The bank switch is closed when the vars are continuously above this value for the <b>Vars-Time Threshold</b> time. The <b>Vars Bank In</b> setting must be greater than the <b>Vars Bank Out</b> setting. (Range: -327680-327680 vars)

TABLE CONTINUED ►

Table 3. Analog Output Points—Continued

Code #	Name—Definition
137	<b>Season 3 Vars - Vars Bank Out</b> —The bank switch is opened when the vars are continuously below this value for the <b>Vars-Time</b> threshold time. The <b>Vars Bank Out</b> setting must be less than the <b>Vars Bank In</b> setting. (Range: -327680-327680 vars)
138	<b>Season 3 Vars - Time Threshold</b> —This is the amount of time the vars must be continuously above or below the specified setting to be considered valid. (Range: 0.1-900.0 seconds)
139	<b>Season 3 Temperature High/Low Threshold</b> —This is the amount of time, in minutes, the temperature must be continuously outside the normal temperature range before a switching operation occurs. (Range: 2-180; Step: 1; Default: 10)
140	<b>Season 4 Month</b> —This is the month Season 4 operation begins. The settings are 1 - 12.
141	<b>Season 4 Day</b> —This is the day Season 4 operation begins. The settings are 1 - 7.
142	<b>Season 4 Timeclock Strategy Schedule 1 - Start Day</b> —This is the first day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 1 of the active <b>Season 4</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
143	<b>Season 4 Timeclock Strategy Schedule 1 - End Day</b> —This is the last day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 1 of the active <b>Season 4</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
144	<b>Season 4 Timeclock Strategy Schedule 1 - Start Time Hours</b> —This is the hour on each scheduled active day the active period begins. The settings are 0 - 23. Applies to Schedule 1 of the active <b>Season 4</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
145	<b>Season 4 Timeclock Strategy Schedule 1 - Start Time Minutes</b> —This is the minute on each scheduled active day the active period begins. The settings are 0 - 59. Applies to Schedule 1 of the active <b>Season 4</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
146	<b>Season 4 Timeclock Strategy Schedule 1 - End Time Hours</b> —This is the hour on each scheduled active day the active period ends. The settings are 0 - 23. Applies to Schedule 1 of the active <b>Season 4</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
147	<b>Season 4 Timeclock Strategy Schedule 1 - End Time Minutes</b> —This is the minute on each scheduled active day the active period ends. The settings are 0 - 59. Applies to Schedule 1 of the active <b>Season 4</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
148	<b>Season 4 Timeclock Strategy Schedule 2 - Start Day</b> —This is the first day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 2 of the active <b>Season 4</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
149	<b>Season 4 Timeclock Strategy Schedule 2 - End Day</b> —This is the last day the bank switch will be active. The settings are 1 - 7. Applies to Schedule 2 of the active <b>Season 4</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .
150	<b>Season 4 Timeclock Strategy Schedule 2 - Start Time Hours</b> —This is the hour on each scheduled active day the active period begins. The settings are 0 - 23. Applies to Schedule 2 of the active <b>Season 4</b> strategy when the strategy is: <b>Timeclock</b> , <b>Time-Biased Voltage</b> , <b>Time-Biased Temperature</b> , or <b>Timeclock + Temperature Override</b> .

TABLE CONTINUED ►

## Analog Output Points

**Table 3. Analog Output Points—Continued**

Code #	Name—Definition
151	<b>Season 4 Timeclock Strategy Schedule 2 - Start Time Minutes</b> —This is the minute on each scheduled active day the active period begins. The settings are 0 - 59. Applies to Schedule 2 of the active <b>Season 4</b> strategy when the strategy is: <b>Timeclock, Time-Biased Voltage, Time-Biased Temperature, or Timeclock + Temperature Override.</b>
152	<b>Season 4 Timeclock Strategy Schedule 2 - End Time Hours</b> —This is the hour on each scheduled active day the active period ends. The settings are 0 - 23. Applies to Schedule 2 of the active <b>Season 4</b> strategy when the strategy is: <b>Timeclock, Time-Biased Voltage, Time-Biased Temperature, or Timeclock + Temperature Override.</b>
153	<b>Season 4 Timeclock Strategy Schedule 2 - End Time Minutes</b> —This is the minute on each scheduled active day the active period ends. The settings are 0 - 59. Applies to Schedule 2 of the active <b>Season 4</b> strategy when the strategy is: <b>Timeclock, Time-Biased Voltage, Time-Biased Temperature, or Timeclock + Temperature Override.</b>
154	<b>Season 4 Strategy</b> —This sets the control strategy used by Season 4. The available strategies are: <ol style="list-style-type: none"> <li>1. <b>Temperature</b></li> <li>2. <b>Timeclock</b></li> <li>3. <b>Voltage Only</b></li> <li>4. <b>Time-Biased Voltage</b></li> <li>5. <b>Time-Biased Temperature</b></li> <li>6. <b>Automatic Offline</b></li> <li>7. <b>Automatic Online</b></li> <li>8. <b>Current</b></li> <li>9. <b>Var</b></li> <li>10. <b>Timeclock + Temperature Override</b></li> <li>11. <b>Current + Temperature Override</b></li> <li>12. <b>Var + Temperature Override</b></li> </ol>
155	<b>Season 4 High-Voltage Override Value</b> —This is the voltage at which the season strategy <b>Automatic Operation</b> is overridden to open the bank switch. The setting must be less than the <b>Emergency High-Voltage Override</b> value and greater than the <b>Low-Voltage Override</b> value. The setting is entered in 0.1-Volt increments.
156	<b>Season 4 High-Voltage Override Time</b> —This is the amount of time the voltage must be continuously above the <b>High-Voltage Override</b> value to be considered valid. (Range: 0.1-900.0 seconds)
157	<b>Season 4 Low-Voltage Override Value</b> —This is the voltage at which the season strategy <b>Automatic Operation</b> is overridden to close the bank switch. The setting must be greater than the <b>Emergency Low-Voltage Override</b> value and less than the <b>High-Voltage Override</b> value. The setting is entered in 0.1-volt increments.
158	<b>Season 4 Low-Voltage Override Time</b> —This is the amount of time the voltage must be continuously below the <b>Low-Voltage Override</b> value to be considered valid. (Range: 0.1-900.0 seconds)
159	<b>Season 4 Temperature Strategy - High-Temp Switches In</b> —The bank switch is closed when the temperature is continuously above this value for the <b>High-/Low-Temperature Time</b> threshold time. The <b>High-Temp Switch In</b> setting must be greater than the <b>High-Temp Switch Out</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
160	<b>Season 4 Temperature Strategy - High-Temp Switches Out</b> —The bank switch is opened when the temperature is continuously below this value for the <b>High-/Low-Temperature Time</b> threshold time. The <b>High-Temp Switch Out</b> setting must be less than the <b>High-Temp Switch In</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
161	<b>Season 4 Temperature Strategy - Low-Temp Switches In</b> —The bank switch is closed when the temperature is continuously below this value for the <b>High-/Low-Temperature Time</b> threshold time. The <b>Low-Temp Switch In</b> setting must be less than the <b>Low-Temp Switch Out</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).

TABLE CONTINUED ►

Table 3. Analog Output Points—Continued

Code #	Name—Definition
162	<b>Season 4 Temperature Strategy - Low-Temp Switches Out</b> —The bank switch is opened when the temperature is continuously above this value for the <b>High-/Low-Temperature Time</b> threshold time. The <b>Low-Temp Switch Out</b> setting must be greater than the <b>Low-Temp Switch In</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
163	<b>Season 4 Voltage Only Strategy - Preferred Position</b> —Settings are: <b>None</b> , specified by a setting of 0; <b>Online</b> , specified by a setting of 1; and <b>Offline</b> , specified by a setting of 2. <b>None</b> : The bank switch does not change positions after a <b>Voltage Override</b> condition clears. <b>Online</b> : The bank switch is closed after a <b>Voltage Override</b> condition clears. <b>Offline</b> : The bank switch is opened after a <b>Voltage Override</b> condition clears.
164	<b>Season 4 Time-Biased Voltage Strategy - Active High Voltage</b> —This is the voltage at which the bank switch is opened during the scheduled active time period. The voltage must remain above this value for the <b>High-/Low-Voltage Time</b> threshold time to be considered valid.
165	<b>Season 4 Time-Biased Voltage Strategy - Active Low Voltage</b> —This is the voltage at which the bank switch is closed during the scheduled active time period. The voltage must remain below this value for the <b>High-/Low-Voltage Time</b> threshold time to be considered valid.
166	<b>Season 4 Time-Biased Voltage Strategy - Inactive High Voltage</b> —This is the voltage at which the bank switch is opened during the scheduled inactive time period. The voltage must remain above this value for the <b>High-/Low- Voltage Time</b> threshold time to be considered valid.
167	<b>Season 4 Time-Biased Voltage Strategy - Inactive Low Voltage</b> —This is the voltage at which the bank switch is closed during the scheduled inactive time period. The voltage must remain below this value for the <b>High-/Low- Voltage Time</b> threshold time to be considered valid.
168	<b>Season 4 Time-Biased Voltage Strategy - High-/Low-Voltage Time</b> —This is the amount of time the voltage must be continuously above or below the specified setting to be considered valid. The setting range is 0.1 - 900.0 seconds.
169	<b>Season 4 Time-Biased Voltage Strategy - Behavior for Inactive Periods</b> —When the <b>Use Voltage Setpoints</b> mode is selected (default), the voltage settings for the inactive periods are followed. When the <b>Offline</b> mode is selected, the voltage setpoints are ignored and the bank is taken offline.
170	<b>Season 4 Time-Biased Temperature - Switch In</b> —The bank switch is closed when the temperature is continuously above this value for the <b>High-/Low-Temperature Time</b> value. The <b>Switch In</b> setting must be greater than the <b>Switch Out</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
171	<b>Season 4 Time-Biased Temperature - Switch Out</b> —The bank switch is opened when the temperature is continuously below this value for the <b>High-/Low-Temperature Time</b> value. The <b>Switch Out</b> setting must be less than the <b>Switch In</b> setting. The setting can only be set in degrees C. The setting range is -45 to 66 degrees C (-49 to 151 degrees F).
172	<b>Season 4 Time-Biased Temperature - High-/Low-Temperature Time</b> —This is the amount of time the temperature must be continuously above or below the specified setting to be considered valid. (Range: 2-180; Step: 1 minute).
173	<b>Season 4 Current - Amps Bank In</b> —The bank switch is closed when the current is continuously above this value for the <b>Time</b> threshold. The <b>Amps Bank In</b> setting must be greater than the <b>Amps Bank Out</b> setting. (Range: 0.0-2550.0 amps)
174	<b>Season 4 Current - Amps Bank Out</b> —The bank switch is opened when the current is continuously below this value for the <b>Time</b> threshold. The <b>Amps Bank Out</b> setting must be less than the <b>Amps Bank In</b> setting. (Range: 0.0-2550.0 amps)
175	<b>Season 4 Current - Time Threshold</b> —This is the amount of time the current must be continuously above or below the specified setting to be considered valid. (Range: 0.1-900.0 seconds)

TABLE CONTINUED ►



## Analog Output Points

**Table 3. Analog Output Points—Continued**

Code #	Name—Definition
176	<b>Season 4 Vars - Vars Bank In</b> —The bank switch is closed when vars are continuously above this value for the <b>Time</b> threshold. The <b>Vars Bank In</b> setting must be greater than the <b>Vars Bank Out</b> setting. (Range: -327680-327680 vars)
177	<b>Season 4 Vars - Vars Bank Out</b> —The bank switch is opened when vars are continuously below this value for the <b>Time</b> threshold. The <b>Vars Bank Out</b> setting must be less than the <b>Vars Bank In</b> setting. (Range: -327680-327680 vars)
178	<b>Season 4 Vars - Time Threshold</b> —The amount of time vars must be continuously above or below the specified setting to be considered valid. (Range: 0.1-900.0 seconds)
179	<b>Season 4 Temperature High/Low Threshold</b> —This is the amount of time, in minutes, the temperature must be continuously outside the normal temperature range before a switching operation occurs. (Range: 2-180; Step: 1; Default: 10)
180	<b>Analog Point Select</b> —Selects a mapped <b>Analog Input</b> point for deadband changes.
181	<b>Selected Analog Deadband %</b> —This is the <b>Deadband %</b> value used for the mapped <b>Analog Input</b> point.
182	<b>Selected Analog Deadband Value</b> —This is the <b>Deadband</b> value used for the mapped <b>Analog Input</b> point.
183	<b>Application Layer Confirm Retry Time</b> —This is the length of time the control waits for an application layer confirmation on an event response message before re-sending the response. The retry time is only in effect when the confirmation process is enabled. (Range: 0.1-32.767 milliseconds)
184	<b>Application Confirmation Retry Count</b> —This is the number of times the control sends an event response message without receiving a confirmation. This number includes the initial response. The retry count is only in effect when the confirmation process is enabled. (Range: 0-10; Step: 0.1 second)
185	<b>Control Point Select Time</b> —During a <b>Select-Before-Operate</b> procedure, this is the length of time elapsing between receiving the <b>Select</b> function for a point and receiving the <b>Operate</b> function for that same point. If an <b>Operate</b> command is not received within this time period, the point is deselected and another <b>Select</b> function is required before the point will operate. (Range: 1.0 to 100.0; Step 0.1 second)
186	<b>Harmonic Distortion Alarm Threshold Time</b> —The <b>Harmonic Alarm</b> is active when any selected <b>Harmonic Distortion Level</b> setpoint is continuously greater than the <b>Harmonic Distortion Alarm Level</b> setting for the <b>Alarm Threshold Time</b> setpoint. (Range: 1-60; Step: 1 second; Default: 10)
187	<b>Harmonic Distortion Alarm Off-Time</b> —This is the time period the <b>Harmonic Alarm</b> condition must continually be clear before the alarm is cleared. (Range 1-5; Step: 1 minute; Default: 1)
188	<b>Corrective Action</b> —This determines the action taken when the <b>Harmonic Alarm</b> becomes active. When set to the <b>None</b> mode, the alarm only provides an indication on the <i>Diagnostics&gt;Harmonic Alarm</i> screen and will not affect bank operation. When set to the <b>Inhibit Bank Switch Operation</b> mode, all automatic bank-switch operations will be inhibited, the OPERATION INHIBIT indicator on the front panel will be lit, and there will be an indication on the <i>Diagnostics&gt;Harmonic Alarm</i> screen. When set to the <b>Open Bank Switch and Inhibit Automatic Operation</b> mode, the bank switch will be taken offline if online, all automatic bank switch operations will be inhibited, the OPERATION INHIBIT indicator on the front panel will be lit, and there will be an indication on the <i>Diagnostics&gt;Harmonic Alarm</i> screen.
189	<b>Harmonic Selections and Level Settings</b> —This point allows a specific harmonic to be selected or unselected and sets the % of pickup at the time of selection. When a specific harmonic is turned off, the percentage data is ignored. A and B select the harmonic to be set as indicated in Table 4: a 0 in C turns off the selected harmonic, a 1 turns on the selected harmonic; and 1 through A in D determines the % threshold. Table 4 on page 23 shows how to determine the code entry required for the settings.

**Table 4. Code Entry Required for Analog Output Point 189 (in Table 3)①**

Harmonic	A	B	C	D	Setting Examples
Voltage-THD	0	0	0 or 1	1 to A	
Voltage-3rd	0	1	0 or 1	1 to A	0112 (hex) turns on the 3rd harmonic for voltage and sets the percentage to 2%. 0112 (hex) is converted to decimal = 274
Voltage-5th	0	2	0 or 1	1 to A	020x (hex) turns off the 5th harmonic for voltage, and x is ignored (pick any from 1 to A). 0201 (hex), for example, is converted to decimal = 513
Voltage-7th	0	3	0 or 1	1 to A	
Voltage-9th	0	4	0 or 1	1 to A	
Voltage-11th	0	5	0 or 1	1 to A	
Voltage-13th	0	6	0 or 1	1 to A	
Voltage-15th	0	7	0 or 1	1 to A	
Voltage-17th	0	8	0 or 1	1 to A	
Voltage-19th	0	9	0 or 1	1 to A	
Voltage-21st	0	A	0 or 1	1 to A	
Voltage-23rd	0	B	0 or 1	1 to A	
Neutral-THD	0	C	0 or 1	1 to A	
Neutral-3rd	0	D	0 or 1	1 to A	0D19 (hex) turns on the 3rd harmonic for neutral current and sets the percentage to 9%. 0D19 (hex) is converted to decimal = 3353
Neutral-5th	0	E	0 or 1	1 to A	
Neutral-7th	0	F	0 or 1	1 to A	
Neutral-9th	1	0	0 or 1	1 to A	100x (hex) turns off the 9th harmonic for neutral, and x is ignored (pick any from 1 to A). 1001 (hex), for example, is converted to decimal = 4097
Current-THD	1	1	0 or 1	1 to A	111A (hex) turns on the Total Harmonic Distortion for current and sets the percentage to 10%. 111A (hex) is converted to decimal = 4378
Current-3rd	1	2	0 or 1	1 to A	
Current-5th	1	3	0 or 1	1 to A	
Current-7th	1	4	0 or 1	1 to A	
Current-9th	1	5	0 or 1	1 to A	
Current-11th	1	6	0 or 1	1 to A	
Current-13th	1	7	0 or 1	1 to A	
Current-15th	1	8	0 or 1	1 to A	
Current-17th	1	9	0 or 1	1 to A	
Current-19th	1	A	0 or 1	1 to A	1A0x (hex) turns off the 19th harmonic for current, and x is ignored (pick any from 1 to A). 1A01 (hex), for example, is converted to decimal = 6657

① Find the hex code in the hex table, convert it to a decimal and enter the decimal value in the SCADA system to be sent to this point.

## Counter Points

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**Table 5. Binary Counter Points**

Code #	Name—Definition
0	Reserved
1	Reserved
2	<b>Daily Automatic Operations</b> —This is the number of switch operations during the day and is incremented when the bank is switched out. This is a 16-bit counter and will overflow back to zero at 65,535.
3	<b>Wi-Fi Intrusion Attempt Counter</b> —This is the number of Wi-Fi Intrusion attempts detected. This is a 16-bit counter and will overflow back to zero at 65,535.

**Table 6. Frozen Counter Points**

Code #	Name—Definition
0	Reserved
1	Reserved
2	<b>Total Frozen Cycles This Day</b> —This is the number of switch operations before the operation counter received a <b>Freeze</b> command, counted during this calendar day.
3	<b>Wi-Fi Intrusion Attempt Counter</b> —This is the number of Wi-Fi intrusion attempts detected.



The object type must be configured on the *Communication>Point Mapping>Controls>DNP Control Point Mapping* screen for each control point when it is mapped. Only the configured object type will be accepted and acted on for that control point. The available object types are **Breaker**, **Latched**, or **Pulse** for each control point. Supported command types are shown in Table 7.

**Table 7. Supported Commands**

CONTROL POINT COMMANDS						
OBJECT TYPE	Breaker Trip	Breaker Close	Latch On	Latch Off	Pulse On	Pulse Off
<b>Breaker</b>	Supported <sup>①</sup>	Supported	Supported	Supported <sup>①</sup>	Not supported	Not supported
<b>Latch</b>	Supported <sup>①</sup>	Supported	Supported	Supported <sup>①</sup>	Not supported	Not supported
<b>Pulse</b>	Not supported	Not supported	Not supported	Not supported	Supported	Supported <sup>①</sup>

<sup>①</sup> Not applicable for control points: 4, 5, 8, 10, and 11.

**Table 8. Control Points**

Code #	Name—Definition
0	<b>Open/Close Switch</b> — <b>Note:</b> If a bank <b>Close</b> operation is attempted while the <b>Reclose Delay Block</b> timer is active, the control reports a hardware error. The control will also return a hardware error if a bank operation is attempted while the control is in <b>Automatic</b> mode unless the <b>SCADA Override</b> setpoint is also enabled. The <b>SCADA Override</b> setting can be enabled with Control Point 2.
1	<b>Enable or Disable Automatic Operation</b> —This command disables all automatic operation (the control is set to <b>Manual</b> mode) until a subsequent <b>Enable Automatic Operation</b> command is issued. As distinguished from Control Point 5 <b>Inhibit Automatic Operation</b> , this command changes the operating mode to <b>Manual</b> and does not time-out. Disabling automatic operation with Control Point 1 will cancel an active <b>SCADA Override</b> status without changing the bank state. In <b>Manual</b> mode, SCADA bank state commands will still be accepted by the control as long as the faceplate <b>SCADA Control</b> mode is set to the <b>Remote</b> setting. <b>Note:</b> <b>Automatic Operation</b> mode is not disabled when the faceplate REMOTE/LOCAL switch is set to the <b>Local</b> position.
2	<b>Enable or Disable SCADA Override Mode</b> —Enabling <b>SCADA Override</b> mode allows subsequent SCADA commands to override automatic operation when the control is in <b>Automatic</b> mode. If the control is in <b>Automatic</b> mode and a SCADA command is issued when <b>SCADA Override</b> mode is disabled, the control will return a hardware error message. When <b>SCADA Override</b> mode is enabled, issuing a <b>Close</b> or <b>Open</b> command to Control Point 0 or a Control Point 6 <b>Inhibit Automatic Operation</b> command will start the <b>SCADA Override</b> timer. When the SCADA Override timer expires, the control reverts to <b>Automatic Operation</b> mode, <b>SCADA Override</b> mode becomes inactive (not disabled), and another SCADA command will override <b>Automatic Operation</b> mode and start the <b>SCADA Override</b> timer. The <b>SCADA Override</b> mode maintains <b>Automatic Operation</b> mode, but it allows a SCADA command to change the bank state and override <b>Automatic Operation</b> mode for the duration of the <b>SCADA Override</b> timer. When the control is in <b>Automatic</b> mode, unless inhibited by the <b>Inhibit Automatic Operation</b> command, <b>Neutral Sensor Corrective Action</b> and <b>Voltage Override</b> modes are still active when SCADA commands an overriding bank action. When enabled, <b>SCADA Override</b> mode remains enabled, even if inactive, until the control is put into <b>Manual Operation</b> mode or a <b>Disable SCADA Override</b> command is received. In <b>Manual</b> mode, any SCADA command is accepted, even if <b>SCADA Override</b> mode is disabled because automatic operation is disabled in <b>Manual</b> mode and there is no automatic activity to override. If <b>SCADA Override</b> mode is active because of an <b>Inhibit Automatic Operation</b> command or an <b>Open</b> or <b>Close</b> command, and <b>Automatic Operation</b> mode is subsequently disabled ( <b>Manual</b> mode is entered) and then re-enabled, <b>SCADA Override</b> mode must be re-enabled before either an <b>Inhibit Automatic Operation</b> command or a <b>Bank Operation</b> command will be accepted.

TABLE CONTINUED ►

## Control Points

**Table 8. Control Points—Continued**

Code #	Name—Definition
3	<b>Reset Neutral Lockout</b> —Starting with software version 1.19 (and later revisions), <b>Neutral Lockout</b> mode is reset when the <b>Operating</b> mode is changed, either from <b>Automatic</b> to <b>Manual</b> or <b>Manual</b> to <b>Automatic</b> mode, which also resets any active <b>Alarm</b> and <b>Lockout</b> conditions. This control point resets <b>Neutral Lockout</b> mode without changing the operating mode.
4	<b>Reset All Alarms, Warnings and Errors</b> —All trouble conditions and error conditions viewed with the <b>Alarm Status</b> button on the <i>Operations</i> screen can be reset with this control point. Starting with software revision 1.19 (and later revisions), all alarms are reset when the <b>Operating</b> mode is changed, either from <b>Automatic</b> to <b>Manual</b> or <b>Manual</b> to <b>Automatic</b> mode, which also resets any lockout conditions. This control point resets all alarms without changing the <b>Operating</b> mode.
5	<p><b>Inhibit Automatic Operation for (Duration of the) SCADA (Override) Timer</b>—When SCADA sends a valid command to this control point, <b>Automatic Operation</b> mode is inhibited for the duration of the <b>SCADA Override</b> timer. If <b>SCADA Override</b> mode is presently active, the <b>SCADA Override</b> timer is reset to its full duration. Any subsequent <b>Automatic Override</b> condition will not be processed and the bank will remain in its present state until the timer expires.</p> <p>To use this command, <b>SCADA Override</b> mode must be presently enabled. If <b>SCADA Override</b> mode is presently disabled, Control Point 2 can be used to enable it. An attempt to issue this command while <b>SCADA Override</b> mode is disabled will cause the control to return a hardware error response, indicating the control is not in the proper state to accept this command.</p> <p>Issuing this command does not allow a <b>SCADA Override</b> bank-operation command to supersede a pre-existing <b>Voltage Override</b> condition because it would place the bank in a state contraindicated by the <b>Voltage Override</b> condition. Such an <b>Operation</b> command will be accepted though, and subsequently acted upon, if the <b>Voltage Override</b> condition clears before the <b>SCADA Override</b> timer expires.</p> <p>When the <b>SCADA Override</b> timer expires, the previous <b>Automatic</b> strategy is resumed. If the timer has not expired, sending an additional <b>Latch On</b> command to this point will restart the <b>SCADA Override Timer</b> and maintain <b>Inhibit Automatic Operation</b> mode for the duration of the timer. If a <b>Latch Off</b> command is sent, both <b>Inhibit Automatic Operation</b> and <b>SCADA Override</b> modes are cancelled.</p> <p>Any <b>Operation</b> command will turn off the <b>Inhibit Automatic Operation</b> mode and restart the <b>SCADA Override</b> timer for the <b>Open</b> or <b>Close</b> operation, as long as there are no other conditions having higher precedence. <b>Inhibit Automatic Operation</b> mode will be cancelled if an emergency <b>Voltage Override</b> condition occurs. A presently active <b>Override</b> condition will supersede a SCADA command to put the bank into a state contrary to that dictated by the <b>Automatic Override</b> condition.</p>
6	<b>Enable/Disable Automatic Bank Voltage Change Calculation</b> —Where applicable, <b>Breaker Close</b> , <b>Latch On</b> , and <b>Pulse On</b> commands enable automatic calculation; where applicable, <b>Breaker Trip</b> , <b>Latch Off</b> , and <b>Pulse Off</b> commands disable the calculation.
7	<b>Reset Voltage Override to Factory (Default) Settings</b> —Where applicable, <b>Breaker Close</b> , <b>Latch On</b> , and <b>Pulse On</b> commands reset all <b>Voltage-Override Level</b> setpoints and <b>Time</b> setpoints for all configured or unconfigured seasons to the proper factory defaults for the nominal system operating voltage.
8	<b>Wi-Fi Enable/Disable</b> —Where applicable, <b>Breaker Close</b> , <b>Latch On</b> , and <b>Pulse On</b> commands enable Wi-Fi; <b>Latch Breaker Open</b> , <b>Latch Off</b> , and <b>Pulse Off</b> commands disable Wi-Fi.
9	<b>Disable Wi-Fi</b> —Where applicable, <b>Breaker Close</b> , <b>Latch On</b> , and <b>Pulse On</b> commands disable Wi-Fi .
10	<b>Enable Wi-Fi</b> —Where applicable, <b>Breaker Close</b> , <b>Latch On</b> , and <b>Pulse On</b> commands enable Wi-Fi.
11	<b>Wi-Fi Test</b> —Where applicable, <b>Breaker Close</b> , <b>Latch On</b> , and <b>Pulse On</b> commands cause Wi-Fi to transmit its SSID.
12	<b>Clear Wi-Fi Intrusion Alarm</b> —Where applicable, <b>Breaker Close</b> , <b>Latch On</b> , and <b>Pulse On</b> commands clear the <b>Wi-Fi Intrusion Alarm</b> .
13	<b>Clear Alarms</b> —Where applicable, <b>Breaker Close</b> , <b>Latch On</b> , and <b>Pulse On</b> commands clear alarms.

TABLE CONTINUED ►

Table 8. Control Points—Continued

Code #	Name—Definition
14	<b>Clear Warnings</b> —Where applicable, <b>Breaker Close</b> , <b>Latch On</b> , and <b>Pulse On</b> commands clear warnings.
15	<b>Clear Errors</b> —Where applicable, <b>Breaker Close</b> , <b>Latch On</b> , and <b>Pulse On</b> commands clear errors.
16	<b>Season 2 Enable/Disable</b> —This enables or disables Season 2 operation.
17	<b>Season 3 Enable/Disable</b> —This enables or disables Season 3 operation. Season 3 can only be enabled if Season 2 is enabled.
18	<b>Season 4 Enable/Disable</b> —This enables or disables Season 4 operation. Season 4 can only be enabled if Season 3 is enabled.
19	<b>Season 1 Temperature Strategy—High-Temp Enable/Disable</b> —This enables or disables the <b>High-Temperature</b> operation mode when the <b>Temperature Strategy</b> mode is selected for Season 1.
20	<b>Season 1 Temperature Strategy—Low-Temp Enable/Disable</b> —This enables or disables the <b>Low-Temperature</b> operation mode when the <b>Temperature Strategy</b> mode is selected for Season 1.
21	<b>Season 2 Temperature Strategy—High-Temp Enable/Disable</b> —This enables or disables the <b>High-Temperature</b> operation mode when the <b>Temperature Strategy</b> mode is selected for Season 2.
22	<b>Season 2 Temperature Strategy—Low-Temp Enable/Disable</b> —This enables or disables the <b>Low-Temperature</b> operation mode when the <b>Temperature Strategy</b> mode is selected for Season 2.
23	<b>Season 3 Temperature Strategy—High-Temp Enable/Disable</b> —This enables or disables the <b>High-Temperature</b> operation mode when the <b>Temperature Strategy</b> mode is selected for Season 3.
24	<b>Season 3 Temperature Strategy—Low-Temp Enable/Disable</b> —The enables or disables the <b>Low-Temperature</b> operation mode when <b>Temperature Strategy</b> mode is selected for Season 3.
25	<b>Season 4 Temperature Strategy—High-Temp Enable/Disable</b> —The enables or disables the <b>High-Temperature</b> operation mode when the <b>Temperature Strategy</b> mode is selected for Season 4.
26	<b>Season 4 Temperature Strategy—Low-Temp Enable/Disable</b> —This enables or disables the <b>Low-Temperature</b> operation mode when the <b>Temperature Strategy</b> mode is selected for Season 4.
27	<b>Bank Voltage Change + Margin</b> —This enables or disables automatic calculation of the <b>Bank Voltage Change + Margin</b> value. This value is added to the <b>High-Voltage Override Time</b> and <b>Low-Voltage Override Time</b> values during a <b>Return to Normal</b> operation.
28	<b>SCADA Override Timer Refresh Mode</b> —Settings are: <b>Operate-Inhibit</b> - specified by a setting of 0, and <b>Message Received</b> - specified by a setting of 1. When <b>SCADA Override</b> mode is active and the <b>Refresh</b> mode is set to <b>Operate-Inhibit</b> mode, the <b>SCADA Override Timer</b> is refreshed when a <b>SCADA Override Open</b> command or a <b>SCADA Override Close</b> command, or an <b>Inhibit Automatic Operation for SCADA Timer</b> command is sent. When <b>SCADA Override</b> mode is active and the <b>Refresh</b> mode is set to the <b>Message Received</b> setting, any SCADA message or command will refresh the <b>SCADA Override</b> timer.
29	<b>Clear Settings Rejected</b> —Clears the <b>Settings Rejected</b> status point.
30	<b>Clear Harmonic Distortion Alarm</b> —This clears the <b>Harmonic Distortion Alarm</b> and resets the <b>Harmonic Distortion Alarm Threshold Timer</b> .
31	<b>Enable Inhibit on Voltage Override</b> —This inhibits the active strategy after a <b>Voltage Override</b> condition for the <b>Inhibit Duration</b> setpoint period. This applies only to season overrides and requires authorization in the “Advanced Settings” section on the <i>Setup&gt;Security</i> screen. This feature does not apply to <b>Time Biased Voltage</b> , <b>Automatic Offline</b> , <b>Automatic Online</b> strategies, or the <b>Emergency High-/Low-Voltage Override</b> conditions.
32	<b>Base Component</b> —This toggles between the <b>Fundamental RMS</b> and <b>Total RMS Base Component</b> setpoint.
33	<b>Season 1 vars kvars</b> —This toggles between the <b>Single-Phase</b> or <b>Three-Phase Reporting Value</b> setpoint.

TABLE CONTINUED ►

## Control Points

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**Table 8. Control Points—Continued**

Code #	Name—Definition
34	<b>Season 2 vars kvars</b> —This toggles between the <b>Single-Phase</b> or <b>Three-Phase Reporting Value</b> setpoint.
35	<b>Season 3 vars kvars</b> —This toggles between the <b>Single-Phase</b> or <b>Three-Phase Reporting Value</b> setpoint.
36	<b>Season 4 vars kvars</b> —This toggles between the <b>Single-Phase</b> or <b>Three-Phase Reporting Value</b> setpoint.
37	<b>Season 1 vars with Temperature kvars</b> —This toggles between the <b>Single-Phase</b> or <b>Three-Phase Reporting Value</b> setpoint.
38	<b>Season 2 vars with Temperature kvars</b> —This toggles between the <b>Single-Phase</b> or <b>Three-Phase Reporting Value</b> setpoint.
39	<b>Season 3 vars with Temperature kvars</b> —This toggles between the <b>Single-Phase</b> or <b>Three-Phase Reporting Value</b> setpoint.
40	<b>Season 4 vars with Temperature kvars</b> —This toggles between the <b>Single-Phase</b> or <b>Three-Phase Reporting Value</b> setpoint.
41	<b>Reporting Values</b> —This toggles between the <b>Single-Phase</b> or <b>Three-Phase Reporting Value</b> setpoint.

Table 9. Group O Objects

Variation	Variation Name	Definition
204	Device location longitude	This is the longitude of the control provided by GPS in decimal degree based on the WGS84 reference. A value of zero is returned when a GPS signal is not available, the <b>Fix Quality</b> is in the <b>Invalid</b> state, or no GPS module is installed. When the GPS module is installed, the present position is always returned, even when <b>GPS</b> mode is not selected for the <b>Time Source Synchronization</b> setpoint on the <i>Setup&gt;General&gt;Time</i> screen.
205	Device location latitude	This is the latitude of the control provided by GPS in decimal degree based on the WGS84 reference. A value of zero is returned when a GPS signal is not available, the <b>Fix Quality</b> is in the <b>Invalid</b> state, or no GPS module is installed. When the GPS module is installed the present position is always returned, even when <b>GPS</b> mode is not selected for the <b>Time Source Synchronization</b> setpoint on the <i>Setup&gt;General&gt;Time</i> screen.
242	Device manufacturer's software version	The S&C implementation will return a string containing the MCU Application and MCU EOS. The following is an example of the string that will be returned: "003.003.004.003 060.001.021.043," representing MCU Application 3.3.4.3, MCU EOS 60.1.21.43.
248	Device serial number	The S&C implementation will return a string containing the IntelliCap 2000 control serial number.

# DNP Implementation

This implementation of DNP and this section of documentation conform to the document DNP V3.00 Subset Definitions, version 0.01, available from the DNP Users Group.

**Table 10. Device Profile Description**

This section describes the compatibility of S&C's implementation of DNP with other devices.

DNP V3.00 DEVICE PROFILE DOCUMENT	
Vendor Name: S&C Electric Company	
Device Name: IntelliCap 2000 Automatic Capacitor Control	
Highest DNP Level Supported: For Requests - Level 2 For Responses - Level 2	Device Function: ___ Master X Slave
Notable objects, functions, and/or qualifiers supported in addition to the Highest DNP Levels Supported (the complete list is described in the attached table): Variation 4 Analog Change Event Object 32 _____ _____ _____	
Maximum Data Link Frame Size (bytes) Transmitted - 292 Received - 292	Max Application Fragment Size (bytes) Transmitted - 249 Received - 249
Maximum Data link Re-tries: X None ___ Fixed at _____ ___ Configurable, range 1 to 25	Maximum Application Layer Re-tries: ___ None ___ Fixed at _____ X Configurable, range 1 to 10 and infinite

Requires Data Link Layer Confirmation:

- Never
- Always
- Sometimes      If "Sometimes," when?
- Configurable      If "Configurable," how?

Requires Application Layer Confirmation:

- Never
- Always (not recommended)
- When reporting Event Data (Slave devices only)
- When sending multi-fragment responses (Slave devices only)
- Sometimes      If "Sometimes," when?
- Configurable      If "Configurable," how? - Response confirmations are configured through SCADA communications or through locally connected setup software.

Timeouts while waiting for:

Data Link Confirm	<input checked="" type="checkbox"/>	None	<input type="checkbox"/>	Fixed	<input type="checkbox"/>	Variable	<input type="checkbox"/>	Config
Complete Appl. Fragment	<input checked="" type="checkbox"/>	None	<input type="checkbox"/>	Fixed	<input type="checkbox"/>	Variable	<input type="checkbox"/>	Config
Application Confirm	<input type="checkbox"/>	None	<input type="checkbox"/>	Fixed	<input type="checkbox"/>	Variable	<input checked="" type="checkbox"/>	Config
Complete Appl. Response	<input checked="" type="checkbox"/>	None	<input type="checkbox"/>	Fixed	<input type="checkbox"/>	Variable	<input type="checkbox"/>	Config

Others \_\_\_\_\_  
 Attach explanation if "Variable" or "Configurable" was checked  
 (see Note 1 for explanation)

Sends/Executes Control Operations:

WRITE Binary Outputs	<input checked="" type="checkbox"/>	Never	<input type="checkbox"/>	Always	<input type="checkbox"/>	Sometimes	<input type="checkbox"/>	Config
SELECT/OPERATE	<input type="checkbox"/>	Never	<input type="checkbox"/>	Always	<input checked="" type="checkbox"/>	Sometimes	<input type="checkbox"/>	Config
DIRECT OPERATE	<input type="checkbox"/>	Never	<input type="checkbox"/>	Always	<input checked="" type="checkbox"/>	Sometimes	<input type="checkbox"/>	Config
DIRECT OPERATE - NO ACK	<input type="checkbox"/>	Never	<input type="checkbox"/>	Always	<input checked="" type="checkbox"/>	Sometimes	<input type="checkbox"/>	Config
Count > 1	<input checked="" type="checkbox"/>	Never	<input type="checkbox"/>	Always	<input type="checkbox"/>	Sometimes	<input type="checkbox"/>	Config
Pulse On	<input type="checkbox"/>	Never	<input type="checkbox"/>	Always	<input checked="" type="checkbox"/>	Sometimes	<input type="checkbox"/>	Config
Pulse Off	<input type="checkbox"/>	Never	<input type="checkbox"/>	Always	<input checked="" type="checkbox"/>	Sometimes	<input type="checkbox"/>	Config
Latch On	<input type="checkbox"/>	Never	<input type="checkbox"/>	Always	<input checked="" type="checkbox"/>	Sometimes	<input type="checkbox"/>	Config
Latch Off	<input type="checkbox"/>	Never	<input type="checkbox"/>	Always	<input checked="" type="checkbox"/>	Sometimes	<input type="checkbox"/>	Config
Queue	<input checked="" type="checkbox"/>	Never	<input type="checkbox"/>	Always	<input type="checkbox"/>	Sometimes	<input type="checkbox"/>	Config
Clear Queue	<input checked="" type="checkbox"/>	Never	<input type="checkbox"/>	Always	<input type="checkbox"/>	Sometimes	<input type="checkbox"/>	Config

Attach explanation if "Sometimes" or "Configurable" was checked  
 (see Note 2 for explanation)

## DNP Implementation

FILL OUT THE FOLLOWING ITEM FOR MASTER DEVICES ONLY:	
Master Expects Binary Input Change Events: <input type="checkbox"/> Either time-tagged or non-time-tagged for a single event <input type="checkbox"/> Both time-tagged and non-time-tagged for a single event <input type="checkbox"/> Configurable (attach explanation)	
FILL OUT THE FOLLOWING ITEMS FOR SLAVE DEVICES ONLY:	
Reports Binary Input Change Events when no specific variation requested:  <input type="checkbox"/> Never <input type="checkbox"/> Only time-tagged <input checked="" type="checkbox"/> Only non-time-tagged <input type="checkbox"/> Configurable to send both	Reports time-tagged Binary Input Change Events when no specific variation requested:  <input type="checkbox"/> Never <input checked="" type="checkbox"/> Binary Input Change with Time <input type="checkbox"/> Bin In Change Relative Time <input type="checkbox"/> Configurable (explain)
Sends Unsolicited Responses:  <input type="checkbox"/> Never <input checked="" type="checkbox"/> Configurable (explain) <input type="checkbox"/> Only certain objects <input type="checkbox"/> Sometimes (explain) <input type="checkbox"/> ENABLE/DISABLE UNSOLICITED <input type="checkbox"/> Function codes supported (see Note 3)	Sends Static Data in Unsolicited Responses:  <input type="checkbox"/> Never <input type="checkbox"/> When Device Restarts <input checked="" type="checkbox"/> When Status Flags Change  No other options are permitted.  (see Note 3)
Default Counter Object/Variation: <input type="checkbox"/> No Counters Reported <input type="checkbox"/> Configurable (explain) <input checked="" type="checkbox"/> Default Object - 20 <input type="checkbox"/> Default Variation - 5 <input type="checkbox"/> Point-by-point list attached	Counters Roll Over at: <input type="checkbox"/> No Counters Reported <input type="checkbox"/> Configurable (explain) <input type="checkbox"/> 16 Bits <input checked="" type="checkbox"/> 32 Bits <input type="checkbox"/> Other Value _____ <input type="checkbox"/> Point-by-point list attached
Sends Multi-Fragment Responses (Slave Only): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	



**NOTE 1: Timeouts While Waiting for Confirmations**

When an application layer response confirmation is requested, the control waits before sending another response/confirmation attempt (if the retry number has not been reached or the confirmation process has been stopped). This Confirmation request uses the timeout period **Time Delay Between Attempts** setpoint.

The **Time Delay Between Attempts** setpoint can be set with the setup software or via SCADA. (See Instruction Sheet 1024-530, “IntelliCap 2000 Automatic Capacitor Control: *Setup*” for more information.)

**NOTE 2: Control Operations Executed**

For all **Binary Output Relay and Analog Output** operations, the allowed control functions are:

- **Select/Operate**
- **Direct Operate**
- **Direct Operate No Ack**

The master station can choose which of these three functions to use at any given time.

The **Trip/Close** bits for these functions must be used in the control block. Set the count value to “1” and the code value to “NUL” (0) or “1.” The control ignores the **On-Time** and **Off-Time** values and the Queue and Clear flags in the control code.

For all momentary point operations, use the **Pulse On** or **Pulse Off** function. When using the **Pulse** option for either function, set the count value in the control block to “1” and the code value to “1.” Set the **Trip/Close** setting to “NUL” (00). The switch control ignores the **On-Time** and **Off-Time** values and the Queue and Clear flags in the control code.

For all latching point operations, use either the **Latch On** or **Latch Off** function. For either function, set the count value in the control block to “1.” Set the code value to “3” for the **Latch On** setting or “4” for the **Latch Off** setting. Set the **Trip/Close** setting to “NUL” (00). The switch control ignores the **On-Time** and **Off-Time** values and the Queue and Clear flags in the control code.

For more information, see the “Control Relay Output Block” section of the document object library in IEEE 1815-2012, available from the DNP Users Group.

**NOTE 3: Unsolicited Responses**

The control returns unsolicited responses to the configured master station address when a change occurs in any status point or when the device is restarted. Object 2, variation 0 (Binary Input Change with Time) is returned.

The control returns unsolicited responses to the configured master station address when a deadband-configurable analog input point change occurs exceeding the configured deadband delta. Object 32, variation 4 (Analog Change Event - Variation 2) is returned.

The control also returns unsolicited responses when certain analog input points have been enabled to report a bank switching event and that event occurs. See Table 11 starting on Page 34. Object 32, variation 2 (Analog Change Event - Variation 2) is returned.

Unsolicited responses can be enabled and disabled from the setup software or via SCADA (function code 20 to enable, function code 21 to disable).

**NOTE 4: Binary Output Status**

In a response to a Binary Output Status request, the control returns a status byte for each control point available. In this implementation of the **Binary Output Status** object, only the **Online** bit is used. All other bits, including the **State** bit, should be ignored.

## DNP Implementation

**Table 11. Implementation Table**

Inspect the state of all digital points (controlled and not controlled) by using the **Binary Input** object. This section describes which objects and requests this implementation accepts and which responses are returned. **Object, Variation, and Qualifier Codes** in the request must exactly match what is expected; otherwise, the switch control flags an error. All application layer responses use the standard response function code 129.

OBJECT			REQUEST		RESPONSE
Obj	Var	Description	Func Code (dec)	Qualifier Codes (hex)	Default Qual. (hex)
0	242	Device Manufacturer's Device Software	1	00,06	00
0	248	Device Manufacturer's Serial Number	1	00,06	00
0	254	Non-Specific All Attribute Request	1	00,06	
0	255	Device List of Attribute	1	00,06	17
1	0	Binary Input - All Variations	1	06	
1	1	Binary Input			00
2	0	Binary Input Change - All Variations	1	06,07,08	
2	1	Binary Input Change without Time	1	06,07,08	17
2	2	Binary Input Change with Time (see Note 4)	1	06,07,08	17
2	3	Binary Input Change with Relative Time (object parsed but no data to return)	1	06,07,08	17
10	0	Binary Output - All Variations	1	06	
10	1	Binary Output (object parsed but WRITE not used)	2	17,28	
10	2	Binary Output Status (only use the on-line bit, see Note 4)			00
12	1	Control Relay Output Block	3,4,5,6	17,28	echo of request
20	0	Binary Counter - All Variations	1,7,8,9,10	06	
20	5	32-Bit Binary Counter without Flag			00
21	0	Frozen Counter - All Variations	1	06	
21	9	32-Bit Frozen Counter without Flag			00
22	0	Counter Change Event - All Variations (object parsed but no data to return)	1	06,07,08	

OBJECT			REQUEST		RESPONSE
Obj	Var	Description	Func Code (dec)	Qualifier Codes (hex)	Default Qual. (hex)
30	0	Analog Input - All Variations	1	06	
30	4	16-Bit Analog Input Without Flag	1	06	00
32	0	Analog Change Event - All Variations	1	06	
32	2	16-Bit Without Time	1	06,07,08	00
40	0	Analog Output Status - All Variations	1	00, 06	
40	2	16-Bit Analog Output Status			00
41	2	16-Bit Analog Output Block	3,4,5,6	17,28	echo of request
50	1	Time and Date	1 read, 2 write	07 where range =1	Date, with time reported to the nearest second
60	1	Class 0 Data	1	06	
60	2	Class 1 Data	1	06,07,08	
60	3	Class 2 Data	1	06,07,08	
60	4	Class 3 Data	1	06,07,08	
80	1	Internal Indications	2	00 index=7	IINs only