



PIR Ready VT7300 Series 24 Vac Low Voltage Fan Coil Thermostats For Commercial and Lodging HVAC Applications

LonWorks Integration Manual ITG-VT7300-PIR-LON-E06 (028-6008 R6 Issue Date: January 21, 2008)



Product Overview

The VT7300 PI thermostat family is specifically designed for fan coil control. The product features a backlit LCD display with dedicated function menu buttons for simple operation. Accurate temperature control is achieved due to the product's PI proportional control algorithm, which virtually eliminates temperature offset associated with traditional, differential-based thermostats.

Models are available for On/Off, 3 point floating and analog 0 to 10 Vdc control.

All models contain can control three, two or single fan speed. 3 additional inputs are also provided for monitoring and / or various advanced functions.

All models feature configurable System and Fan button functions to meet all possible applications. They all contain an SPST auxiliary switch that can be used to control lighting or auxiliary reheat.



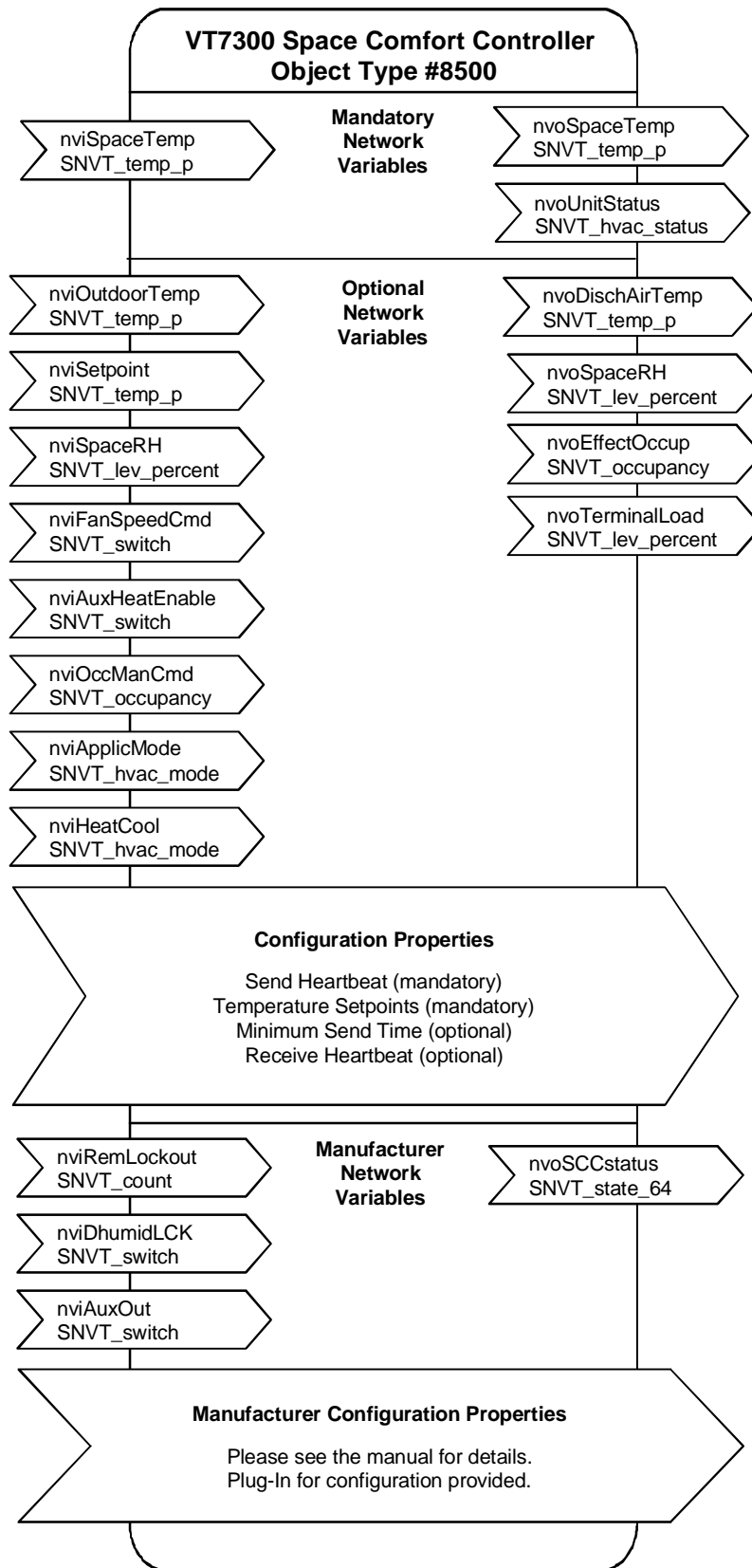
The thermostats are also compatible with the new Viconics PIR cover accessories. Thermostats equipped with a PIR cover provide advanced active occupancy logic, which will automatically switch occupancy levels from Occupied to Stand-By and Unoccupied as required by local activity being present or not. This advanced occupancy functionality provides advantageous energy savings during occupied hours without sacrificing occupant comfort. All thermostats can be ordered with or without a factory installed PIR cover (see notes below).

The additional following documents are available at: www.viconics.com

- Detailed information on the thermostat (VT73xxX5x00x), is available on document: *LIT-VT7300-PIR-Exx*.
- PIR application information and examples, are available on document: *APP-PIR-Guide-Exx*
- PIR cover installation information is available on document: *PIR Cover Installation-Exx*

Contents

- Thermostat Objects
- SNVTs and SCPTs Table Per Model
- Input Network Variables (nvi's) Description
- Output Network Variables (nvo's) Description
- Configuration Properties (nci's) Description
- Integration - Global Commands
- Integration - Graphic User Interface (GUI) Objects
- Integration - Configuration Objects
- Wiring Guide
 - Overview
 - Network Configuration
 - Maximum Number Of Devices
 - Maximum Cable Length
 - EI-485 Repeaters
 - Terminators
- Network Adapter
- Software Files
- RoHS and Non-RoSH APB and NXE Files
- Device Identification
- Tips And Things You Need To Know
- Troubleshooting Section
- Document Control



SNVTs¹ and SCPTs² Table Per Model

| Model Number | | | VT7300A5x00E | VT7300C5x00E | VT7350C5x00E | VT7305A5x00E | VT7305C5x00E | VT7355C5x00E | VT7300F5x00E | VT7350F5x00E | VT7305F5x00E | VT7355F5x00E | VT7300M5x00E |
|-----------------------------------|-----|-------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| No | Sub | Point Name | | | | | | | | | | | |
| N/A: Not applicable on this model | | | | | | | | | | | | | |
| 0 | | nviSpaceTemp | X | X | X | X | X | X | X | X | X | X | X |
| 1 | | nviOutdoorTemp | X | X | X | X | X | X | X | X | X | X | X |
| 2 | | nviSetpoint | X | X | X | X | X | X | X | X | X | X | X |
| 3 | | nviSpaceRH | N/A | N/A | X | N/A | N/A | X | N/A | X | N/A | X | N/A |
| 4 | | nviFanSpeedCmd | X | X | X | X | X | X | X | X | X | X | X |
| 5 | | nviAuxHeatEnable | X | X | X | X | X | X | X | X | X | X | X |
| 6 | | nviOccManCmd | X | X | X | X | X | X | X | X | X | X | X |
| 7 | | nviApplicMode | X | X | X | X | X | X | X | X | X | X | X |
| 8 | | nviHeatCool | X | X | X | X | X | X | X | X | X | X | X |
| 9 | | nviRemLockout | X | X | X | X | X | X | X | X | X | X | X |
| 10 | | nviDhumiLCK | N/A | N/A | X | N/A | N/A | X | N/A | X | N/A | X | N/A |
| 11 | | nviAuxOut | X | X | X | X | X | X | X | X | X | X | X |
| 12 | | nvoSpaceTemp | X | X | X | X | X | X | X | X | X | X | X |
| 13 | | nvoDischAirTemp | X | X | X | X | X | X | X | X | X | X | X |
| 14 | | nvoSpaceRH | N/A | N/A | X | N/A | N/A | X | N/A | X | N/A | X | N/A |
| 15 | | nvoEffectOccup | X | X | X | X | X | X | X | X | X | X | X |
| 16 | | nvoUnitStatus | X | X | X | X | X | X | X | X | X | X | X |
| | 1 | mode | x | x | x | x | x | x | x | x | x | x | x |
| | 2 | heat_output_primary | x | x | x | x | x | x | x | x | x | x | x |
| | 4 | cool_output | x | x | x | x | x | x | x | x | x | x | x |
| | 6 | fan_output | x | x | x | x | x | x | x | x | x | x | x |
| | 7 | in_alarm | x | x | x | x | x | x | x | x | x | x | x |
| 17 | | nvoSccStatus | X | X | X | X | X | X | X | X | X | X | X |
| | 1 | StateTerminal BO2 | x | x | x | x | x | N/A | N/A | N/A | N/A | N/A | N/A |
| | 2 | StateTerminal BO1 | N/A | x | x | N/A | x | N/A | N/A | N/A | N/A | N/A | N/A |
| | 3 | StateTerminal BO4 | N/A | x | x | N/A | x | N/A | N/A | N/A | N/A | N/A | N/A |
| | 4 | StateTerminal BO3 | x | x | x | x | x | N/A | N/A | N/A | N/A | N/A | N/A |
| | 5 | StateTerminal BO5 | x | x | x | x | x | x | x | x | x | x | x |
| | 6 | FanLow | x | x | x | x | x | x | x | x | x | x | N/A |
| | 7 | FanMed | x | x | x | x | x | x | x | x | x | x | N/A |
| | 8 | FanHigh | x | x | x | x | x | x | x | x | x | x | x |
| | 9 | UI 3 Status | x | x | x | x | x | x | x | x | x | x | x |
| | 10 | BI 2 Status | x | x | x | x | x | x | x | x | x | x | x |
| | 11 | B1 Status | x | x | x | x | x | x | x | x | x | x | x |
| | 12 | Local PIR Motion | x | x | x | x | x | x | x | x | x | x | x |
| | 13 | Service Alarm | x | x | x | x | x | x | x | x | x | x | x |
| | 14 | Filter Alarm | x | x | x | x | x | x | x | x | x | x | x |
| | 15 | Window Opened | x | x | x | x | x | x | x | x | x | x | x |
| | 16 | Dehumidification Active | N/A | N/A | x | N/A | N/A | x | N/A | x | N/A | x | N/A |
| 18 | | nvoTerminalLoad | X | X | X | X | X | X | X | X | X | X | X |

1: SNVTs: Standard Network Variables Types

2: SCPTs: Standard Configuration Parameters Types

| Model Number | | | VT7300A5x00E | VT7300C5x00E | VT7350C5x00E | VT7305A5x00E | VT7305C5x00E | VT7355C5x00E | VT7300F5x00E | VT7350F5x00E | VT7305F5x00E | VT7355F5x00E | VT7300M5x00E |
|-----------------------------------|-----|--------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| No | Sub | Point Name | | | | | | | | | | | |
| N/A: Not applicable on this model | | | | | | | | | | | | | |
| 19 | | nciSetpoints | X | X | X | X | X | X | X | X | X | X | X |
| | 1 | occupied_cool | x | x | x | x | x | x | x | x | x | x | x |
| | 2 | standby_cool | x | x | x | x | x | x | x | x | x | x | x |
| | 3 | unoccupied_cool | x | x | x | x | x | x | x | x | x | x | x |
| | 4 | occupied_heat | x | x | x | x | x | x | x | x | x | x | x |
| | 5 | standby_heat | x | x | x | x | x | x | x | x | x | x | x |
| | 6 | unoccupied_heat | x | x | x | x | x | x | x | x | x | x | x |
| 20 | | nciRHmodel | N/A | N/A | X | N/A | N/A | X | N/A | X | N/A | X | N/A |
| | 1 | RHdisplay | N/A | N/A | x | N/A | N/A | x | N/A | x | N/A | x | N/A |
| | 2 | RHsetpoint | N/A | N/A | x | N/A | N/A | x | N/A | x | N/A | x | N/A |
| | 3 | DehumHyst | N/A | N/A | x | N/A | N/A | x | N/A | x | N/A | x | N/A |
| | 4 | DehumCool | N/A | N/A | x | N/A | N/A | x | N/A | x | N/A | x | N/A |
| | 5 | RHcalib | N/A | N/A | x | N/A | N/A | x | N/A | x | N/A | x | N/A |
| 21 | | nciGenOpt | X | X | X | X | X | X | X | X | X | X | X |
| | 1 | Control Type | N/A | x | x | N/A | x | x | N/A | N/A | N/A | N/A | N/A |
| | 2 | Drive Time | x | x | x | x | x | x | N/A | N/A | N/A | N/A | N/A |
| | 3 | Cycles Per Hour | x | x | x | x | x | x | N/A | N/A | N/A | N/A | N/A |
| | 4 | Reverse Acting Output | N/A | N/A | N/A | N/A | N/A | N/A | x | x | x | x | x |
| | 5 | BI1 | x | x | x | x | x | x | x | x | x | x | x |
| | 6 | BI2 | x | x | x | x | x | x | x | x | x | x | x |
| | 7 | UI3 | x | x | x | x | x | x | x | x | x | x | x |
| | 8 | Menu Scroll | x | x | x | x | x | x | x | x | x | x | x |
| | 9 | Auto Mode | x | x | x | x | x | x | x | x | x | x | N/A |
| | 10 | Temperature Scale | x | x | x | x | x | x | x | x | x | x | x |
| | 11 | Pipes # Main out config | x | x | x | x | x | x | x | x | x | x | x |
| | 12 | Sequence of Operation | x | x | x | x | x | x | x | x | x | x | N/A |
| | 13 | Fan Menu Sequence | x | x | x | x | x | x | x | x | x | x | N/A |
| | 14 | Heat Maximum setpoint | x | x | x | x | x | x | x | x | x | x | x |
| | 15 | Cool Minimum setpoint | x | x | x | x | x | x | x | x | x | x | x |
| | 16 | SetpointType | x | x | x | x | x | x | x | x | x | x | x |
| | 17 | Temporary Occ Time | x | x | x | x | x | x | x | x | x | x | x |
| | 18 | Deadband | x | x | x | x | x | x | x | x | x | x | x |
| | 19 | Calibration Room Sensor | x | x | x | x | x | x | x | x | x | x | x |
| | 20 | Auxiliary Contact Config | x | x | x | x | x | x | x | x | x | x | x |
| | 21 | Reheat Time Base | x | x | x | x | x | x | x | x | x | x | x |
| | 22 | Fan Mode | x | x | x | x | x | x | x | x | x | x | x |
| | 23 | PIR Stand-By Timer | x | x | x | x | x | x | x | x | x | x | x |
| | 24 | PIR Unoccupied Timer | x | x | x | x | x | x | x | x | x | x | x |
| 22 | | nciSccModel | X | X | X | X | X | X | X | X | X | X | X |
| | 1 | Thermostat Model | x | x | x | x | x | x | x | x | x | x | x |
| | 2 | Software Version | x | x | x | x | x | x | x | x | x | x | x |
| 23 | | nciHvacType | X | X | X | X | X | X | X | X | X | X | X |
| 24 | | nciSndHrtBt | X | X | X | X | X | X | X | X | X | X | X |
| 25 | | nciMinOuttM | X | X | X | X | X | X | X | X | X | X | X |
| 26 | | nciRcvHrtBt | X | X | X | X | X | X | X | X | X | X | X |
| 27 | | nciMajVer | X | X | X | X | X | X | X | X | X | X | X |
| 28 | | nciMinVer | X | X | X | X | X | X | X | X | X | X | X |

Input Network Variables (nvi's) Description

| Parameter | Variable Name | Function |
|--------------------------------|--|--|
| Room Temperature | network input SNVT_temp_p nviSpaceTemp | <ul style="list-style-type: none"> ➤ This input network variable provides a network remote temperature value to the thermostat. When linked or written to, the internal temperature reading (internal sensor) is no longer used. ➤ Valid Range: 40 to 122°F (-40 to 50°C) ➤ Default Null (release) Value: 621.81°F (327.67°C or 0x7FFF) ➤ This network variable is subject to the Receive HeartBeat Time, nviRcvHrtBt. |
| Outdoor Air Temperature | network input SNVT_temp_p nviOutdoorTemp | <ul style="list-style-type: none"> ➤ This input network variable provides outdoor air temperature information to the thermostat from a network value temperature value. The device will automatically display the value on its display when linked. ➤ Valid Range: 40 to 122°F (-40 to 50°C) ➤ Default Null (release) Value: 621.81°F (327.67°C or 0x7FFF) |
| Occupied Cool & Heat Setpoints | network Input SNVT_temp_p nviSetpoint | <ul style="list-style-type: none"> ➤ This input network variable is used to allow the occupied temperature setpoints only to be changed via the network from a single analog value. (Note: the Stand-By and Unoccupied setpoints are not changed). The corresponding heating and cooling values are derived from the minimum deadband configuration value ➤ Default Null Value: 621.81°F (327.67°C or 0x7FFF) ➤ Ex. If the minimum deadband configuration value = 2 °F and nviSetpoint = 70°F. <ul style="list-style-type: none"> • The resulting Occupied heating setpoint will equal 69 °F which is derived from 70 °F minus ½ the minimum deadband configuration value of 2 °F • The resulting Occupied cooling setpoint will equal 71 °F which is derived from 70 °F plus ½ the minimum deadband configuration value of 2 °F |
| Room Humidity | network input SNVT_lev_percent nviSpaceRH | <ul style="list-style-type: none"> ➤ This input network variable is the measured room humidity in percent monitored by the thermostat. ➤ Valid Range: 5 to 90% ➤ Default Null Value: +163.835 (0x7FFF) ➤ This network variable is subject to the Receive HeartBeat Time, nviRcvHrtBt |

| Parameter | Variable Name | Function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|---|---|----------------|----------------------------|--------------------------|------------------------|-----------------|----------------------------|---|-----|----------|-----------------------|----------|-------------------------------------|----|-----------------------|---------|---------|------------|-------------------|---|-----------|---------------|--------|---|------------|------------|------|---|------------|------|---------------------|------|-----|-----|------------------------|---|---|----|-----|-----------------------|---|---|----|-----------------------|---|----------|------------|-----|---|------------|--------------|------|---|------------|------|---------------------|------|-----|-----|------------------------|---|---|-----|-----|-----------------------|---|---|----|-----------------------|---|---------|------------|-----|---|-----------|---------------|--------|---|------------|------------|------|---|------------|------|---------------------|------|-----|-----|------|---|---|----|-----|-----------------------|---|---|----|-----------------------|---|----------|------------|-----|---|------------|--------------|------|---|------------|------|---------------------|------|-----|-----|------|---|---|----|-----|-----------------------|---|---|----|-----------------------|---|----------|-------------|-----------|---|------------|------|----------------------|---|------------|------|----------------------|------|-----|-----|------|
| Fan Mode | network input SNVT_switch nviFanSpeedCmd | <ul style="list-style-type: none"> ➤ This input network variable is used to connect an external fan speed switch to the node or to allow any supervisory device to override the fan speed controlled by the node's control algorithm. ➤ This input is used in conjunction with FanMenu bit in nciGenOpts. ➤ Default Null Value: AUTO (state = 0xFF) ➤ Valid Range: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>Fan Menu Value</th> <th>State</th> <th>Value</th> <th>Equivalent Percent</th> <th>Requested Speed</th> </tr> </thead> <tbody> <tr> <td rowspan="7">0</td> <td>0</td> <td>N/A</td> <td>N/A</td> <td>Off - Not Used</td> </tr> <tr> <td>1</td> <td>0</td> <td>0%</td> <td>Off - Not Used</td> </tr> <tr> <td>1</td> <td>1 to 66</td> <td>0.5 to 33%</td> <td>Low</td> </tr> <tr> <td>1</td> <td>67 to 133</td> <td>33.5 to 66.5%</td> <td>Medium</td> </tr> <tr> <td>1</td> <td>134 to 200</td> <td>67 to 100%</td> <td>High</td> </tr> <tr> <td>1</td> <td>201 to 255</td> <td>100%</td> <td>3 - Not Used</td> </tr> <tr> <td>0xFF</td> <td>N/A</td> <td>N/A</td> <td>Auto - Not Used</td> </tr> <tr> <td rowspan="6">1</td> <td>0</td> <td>n/</td> <td>N/A</td> <td>Off - Not Used</td> </tr> <tr> <td>1</td> <td>0</td> <td>0%</td> <td>Off - Not Used</td> </tr> <tr> <td>1</td> <td>0 to 100</td> <td>0.5 to 50%</td> <td>Low</td> </tr> <tr> <td>1</td> <td>101 to 200</td> <td>50.5 to 100%</td> <td>High</td> </tr> <tr> <td>1</td> <td>201 to 255</td> <td>100%</td> <td>2 - Not Used</td> </tr> <tr> <td>0xFF</td> <td>N/A</td> <td>N/A</td> <td>Auto - Not Used</td> </tr> <tr> <td rowspan="6">2</td> <td>0</td> <td>N/A</td> <td>N/A</td> <td>Off - Not Used</td> </tr> <tr> <td>1</td> <td>0</td> <td>0%</td> <td>Off - Not Used</td> </tr> <tr> <td>1</td> <td>1 to 66</td> <td>0.5 to 33%</td> <td>Low</td> </tr> <tr> <td>1</td> <td>67 to 133</td> <td>33.5 to 66.5%</td> <td>Medium</td> </tr> <tr> <td>1</td> <td>134 to 200</td> <td>67 to 100%</td> <td>High</td> </tr> <tr> <td>1</td> <td>201 to 255</td> <td>100%</td> <td>3 - Not Used</td> </tr> <tr> <td>0xFF</td> <td>N/A</td> <td>N/A</td> <td>Auto</td> </tr> <tr> <td rowspan="6">3</td> <td>0</td> <td>n/</td> <td>N/A</td> <td>Off - Not Used</td> </tr> <tr> <td>1</td> <td>0</td> <td>0%</td> <td>Off - Not Used</td> </tr> <tr> <td>1</td> <td>0 to 100</td> <td>0.5 to 50%</td> <td>Low</td> </tr> <tr> <td>1</td> <td>101 to 200</td> <td>50.5 to 100%</td> <td>High</td> </tr> <tr> <td>1</td> <td>201 to 255</td> <td>100%</td> <td>2 - Not Used</td> </tr> <tr> <td>0xFF</td> <td>N/A</td> <td>N/A</td> <td>Auto</td> </tr> <tr> <td rowspan="6">4</td> <td>0</td> <td>n/</td> <td>N/A</td> <td>Off - Not Used</td> </tr> <tr> <td>1</td> <td>0</td> <td>0%</td> <td>Off - Not Used</td> </tr> <tr> <td>1</td> <td>1 to 200</td> <td>0.5 to 100%</td> <td>On (High)</td> </tr> <tr> <td>1</td> <td>201 to 255</td> <td>100%</td> <td>On - Not Used</td> </tr> <tr> <td>1</td> <td>201 to 255</td> <td>100%</td> <td>On - Not Used</td> </tr> <tr> <td>0xFF</td> <td>N/A</td> <td>N/A</td> <td>Auto</td> </tr> </tbody> </table> | Fan Menu Value | State | Value | Equivalent Percent | Requested Speed | 0 | 0 | N/A | N/A | Off - Not Used | 1 | 0 | 0% | Off - Not Used | 1 | 1 to 66 | 0.5 to 33% | Low | 1 | 67 to 133 | 33.5 to 66.5% | Medium | 1 | 134 to 200 | 67 to 100% | High | 1 | 201 to 255 | 100% | 3 - Not Used | 0xFF | N/A | N/A | Auto - Not Used | 1 | 0 | n/ | N/A | Off - Not Used | 1 | 0 | 0% | Off - Not Used | 1 | 0 to 100 | 0.5 to 50% | Low | 1 | 101 to 200 | 50.5 to 100% | High | 1 | 201 to 255 | 100% | 2 - Not Used | 0xFF | N/A | N/A | Auto - Not Used | 2 | 0 | N/A | N/A | Off - Not Used | 1 | 0 | 0% | Off - Not Used | 1 | 1 to 66 | 0.5 to 33% | Low | 1 | 67 to 133 | 33.5 to 66.5% | Medium | 1 | 134 to 200 | 67 to 100% | High | 1 | 201 to 255 | 100% | 3 - Not Used | 0xFF | N/A | N/A | Auto | 3 | 0 | n/ | N/A | Off - Not Used | 1 | 0 | 0% | Off - Not Used | 1 | 0 to 100 | 0.5 to 50% | Low | 1 | 101 to 200 | 50.5 to 100% | High | 1 | 201 to 255 | 100% | 2 - Not Used | 0xFF | N/A | N/A | Auto | 4 | 0 | n/ | N/A | Off - Not Used | 1 | 0 | 0% | Off - Not Used | 1 | 1 to 200 | 0.5 to 100% | On (High) | 1 | 201 to 255 | 100% | On - Not Used | 1 | 201 to 255 | 100% | On - Not Used | 0xFF | N/A | N/A | Auto |
| | | Fan Menu Value | State | Value | Equivalent Percent | Requested Speed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 0 | 0 | N/A | N/A | Off - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 | 0 | 0% | Off - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 | 1 to 66 | 0.5 to 33% | Low | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 | 67 to 133 | 33.5 to 66.5% | Medium | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 | 134 to 200 | 67 to 100% | High | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 | 201 to 255 | 100% | 3 - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0xFF | N/A | N/A | Auto - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | n/ | N/A | Off - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 0 | 0% | Off - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 0 to 100 | 0.5 to 50% | Low | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 101 to 200 | 50.5 to 100% | High | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 201 to 255 | 100% | 2 - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0xFF | N/A | N/A | Auto - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0 | N/A | N/A | Off - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 0 | 0% | Off - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 1 to 66 | 0.5 to 33% | Low | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 67 to 133 | 33.5 to 66.5% | Medium | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 134 to 200 | 67 to 100% | High | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 201 to 255 | 100% | 3 - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0xFF | N/A | N/A | Auto | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0 | n/ | N/A | Off - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 0 | 0% | Off - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 0 to 100 | 0.5 to 50% | Low | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 101 to 200 | 50.5 to 100% | High | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 201 to 255 | 100% | 2 - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0xFF | N/A | N/A | Auto | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 0 | n/ | N/A | Off - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 0 | 0% | Off - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 1 to 200 | 0.5 to 100% | On (High) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 201 to 255 | 100% | On - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 201 to 255 | 100% | On - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0xFF | N/A | N/A | Auto | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sequence of Operation | network input SNVT_switch nviAuxHeatEnable¹ | <ul style="list-style-type: none"> ➤ This input network variable is used to enable or disable the auxiliary heat stage. ➤ This input is used in conjunction with nviHeatCool and SeqOper. ➤ Default Null Value: AUTO (state = 0xFF) ➤ Set value to 100% for both On & Off state ➤ Valid Range: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>State</th> <th>Value</th> <th>Auxiliary Heat Operation</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>N/A</td> <td>Disabled - Not Used</td> </tr> <tr> <td>1</td> <td>0 %</td> <td>Disabled</td> </tr> <tr> <td>1</td> <td>1 to 99%</td> <td>Partially Enabled - Not Used</td> </tr> <tr> <td>1</td> <td>100%</td> <td>Enabled</td> </tr> <tr> <td>0xFF</td> <td>N/A</td> <td>Enabled (invalid)</td> </tr> </tbody> </table> | State | Value | Auxiliary Heat Operation | 0 | N/A | Disabled - Not Used | 1 | 0 % | Disabled | 1 | 1 to 99% | Partially Enabled - Not Used | 1 | 100% | Enabled | 0xFF | N/A | Enabled (invalid) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | State | Value | Auxiliary Heat Operation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 0 | N/A | Disabled - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 1 | 0 % | Disabled | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 to 99% | Partially Enabled - Not Used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 100% | Enabled | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0xFF | N/A | Enabled (invalid) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| See note 1 below | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Parameter | Variable Name | Function |
|-------------|---|---|
| Occupancy | network input SNVT_occupancy nviOccManCmd | <ul style="list-style-type: none"> ➤ This input network variable is used to command the Space Comfort Controller into different occupancy modes. It is typically set by a supervisory node to remotely control the occupancy modes to override the local occupancy routines of the thermostat. ➤ Default Null Value: OC_NUL = 0xFF ➤ Valid Range: <ul style="list-style-type: none"> 0 = OC_OCCUPIED * 1 = OC_UNOCCUPIED) 2 = OC_BYPASS – Not Used 3 = OC_STANDY – Not Used 0xFF = OC_NUL (Release to internal occupancy)** <p>* OC_OCCUPIED and OC_UNOCCUPIED commands will always have full authority over the local occupancy routines of the thermostat may they be a local input or a PIR cover.</p> <p>** OC_NUL command will release the thermostat to use its own internal occupancy routine driven from one of the digital input or a PIR cover installed on board.</p> |
| System Mode | network input SNVT_hvac_mode nviApplicMode | <ul style="list-style-type: none"> ➤ This network variable input is used to coordinate the Space Comfort Controller with any node that may need to control the heat/cool changeover of the unit. ➤ This input is used in conjunction with nviHeatCool and SeqOper. ➤ Default Null Value: HVAC_AUTO. ➤ This network variable is subject to the receive heartbeat time, nciRcvHrtBt ➤ Valid Range: <ul style="list-style-type: none"> 0 = HVAC_AUTO 1 = HVAC_HEAT 2 = HVAC_MRNG_WRMUP – Not Used 3 = HVAC_COOL 4 = HVAC_NIGHT_PURGE – Not Used 5 = HVAC_PRE_COOL – Not Used 6 = HVAC_OFF 7 = HVAC_TEST – Not Used 8 = HVAC_EMERG_HEAT – Not Used 9 = HVAC_FAN_ONLY – Not Used 12 = HVAC_MAX_HEAT – Not Used 13 = HVAC_ECONOMY – Not Used 14 = HVAC_DEHUMID – Not Used 15 = HVAC_CALIBRATE – Not Used 0xFF = HVAC_NUL – Not Used |

Output Network Variables (nvo's) Description

All output network variables will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value.

An output network variable will be transmitted immediately when its value has changed significantly (manufacturer's defined). Additionally, this variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

| Parameter | Variable Name | Function | | | | |
|----------------------------|---|--|-----|------|-------------|----|
| Room Temperature | network output SNVT_temp_p nvoSpaceTemp | <ul style="list-style-type: none"> ➤ This output network variable is used to monitor the effective space temperature sensor that the Space Comfort Controller is using for control. This output echoes the value of the input. ➤ Valid Range: 14 to 122°F (-10 to 50°C) ➤ The value 621.07°F (327.67°C or 0x7FFF) will be sent as an invalid value in case of a sensor failure. | | | | |
| Supply Temperature | network output SNVT_temp_p nvoDischAirTemp | <ul style="list-style-type: none"> ➤ This output network variable is used to monitor the temperature of the air that leaves the Space Comfort Controller NOTE: UI3 needs to be configured to (SS) Supply air sensor monitoring ➤ Valid Range: -40 to 122°F (-40 to 50°C) ➤ The value 621.81°F (327.67°C or 0x7FFF) will be sent as an invalid value in case of a sensor failure. | | | | |
| Room Humidity | network output SNVT_lev_percent nvoSpaceRH | <ul style="list-style-type: none"> ➤ This output network variable indicates the space humidity in percent. ➤ Valid Range: 0 to 100%. ➤ The value 0x7FFF = +163.835% will be set as an invalid value to indicate a humidity sensor failure. | | | | |
| Occupancy | network output SNVT_occupancy nvoEffectOccup | <ul style="list-style-type: none"> ➤ This output network variable is used to indicate the actual occupancy mode of the unit. This information is typically reported to a supervisory controller or provided to another Space Comfort Controller to coordinate the operation of multiple units ➤ Valid Range: <ul style="list-style-type: none"> 0 = OC_OCCUPIED 1 = OC_UNOCCUPIED 2 = OC_BYPASS¹ 3 = OC_STANDBY <p>Note 1: OC_BYPASS can be initiated by either nviOccManCmd or a local input. NvoEffectOccup will only be in OC_BYPASS for the duration of the ToccTime (nciGenOpts), until reinitiated by either a transition of the local input or an update to nviOccManCmd.</p> | | | | |
| Unit Status network output | SNVT_hvac_status nvoUnitStatus | <ul style="list-style-type: none"> ➤ This output network variable is available to report the Space Comfort Controller status. It combines the operating mode, the capacity of heating and cooling used and an indication if any alarms are present in the object. | | | | |
| | | <table border="1"> <thead> <tr> <th>Sub</th> <th>Name</th> <th>Valid Value</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>mode</td> <td> HVAC_AUTO HVAC_HEAT HVAC_MRNG_WRMUP – Not Used HVAC_COOL HVAC_NIGHT_PURGE – Not Used HVAC_PRE_COOL – Not Used HVAC_HVAC_OFF HVAC_HVAC_TEST – Not Used HVAC_HVAC_EMERG_HEAT – Not Used </td> </tr> </tbody> </table> | Sub | Name | Valid Value | 01 |
| Sub | Name | Valid Value | | | | |
| 01 | mode | HVAC_AUTO HVAC_HEAT HVAC_MRNG_WRMUP – Not Used HVAC_COOL HVAC_NIGHT_PURGE – Not Used HVAC_PRE_COOL – Not Used HVAC_HVAC_OFF HVAC_HVAC_TEST – Not Used HVAC_HVAC_EMERG_HEAT – Not Used | | | | |

| Parameter | Variable Name | Function | | | |
|----------------------------------|---|--|---------------------------|--|-------------------|
| Unit Status network output | SNVT_hvac_status nvoUnitStatus | Sub | Name | Valid Value | |
| | | | | HVAC_FAN_ONLY – Not Used HVAC_MAX_HEAT – Not Used | |
| | | 02: | heat_output _primary | 0-100%, 0x7FFF (Invalid) | |
| | | 03 | heat_output _secondary | Not Used | |
| | | 04 | cool_output: | 0-100%, 0x7FFF (Invalid) | |
| | | 05 | econ_output | Not Used | |
| | | 06 | fan_output | 0-100%, 0x7FFF (Invalid) | |
| | | 07 | In_alarm | 0 (No alarms) 1 (Alarm On) 0x7FF (Alarming disabled) – Not Used | |
| Thermostat's I/O status | network output UNVT_fc_thermo_ state nvoSccStatus | ➤ This network variable output is used to report the Space Comfort Controller inputs' and outputs' status. | | | |
| | | Sub | Name | Valid value | Default Value |
| | | 01 | StateTerminal BO2 | 0 = Off 1 = On | 0 = Off |
| | | 02 | StateTerminal BO1 | 0 = Off 1 = On | 0 = Off |
| | | 03 | StateTerminal BO4 | 0 = Off 1 = On | 0 = Off |
| | | 04 | StateTerminal BO3 | 0 = Off 1 = On | 0 = Off |
| | | 05 | StateTerminal BO5 | 0 = Off 1 = On | 0 = Off |
| | | 06 | FanLow | 0 = Off 1 = On | 0 = Off |
| | | 07 | FanMed | 0 = Off 1 = On | 0 = Off |
| | | 08 | FanHigh | 0 = Off 1 = On | 0 = Off |
| | | 09 | UI3 Status | -40 to 122 °F (-40 to 50°C) 40°F = Open 122°F = Close | N/A |
| | | 10 | BI2 Status | 0 = activated 1 = not activated | 1 = not activated |
| | | 11 | BI1 Status | 0 = activated 1 = not activated | 1 = not activated |
| | | 12 | Local PIR Motion | 0 = No motion 1 = Motion | 0 = No motion |
| | | 13 | Service Alarm | 0 = No alarm 1 = Alarm on | 0 = No alarm |
| | | 14 | Filter Alarm | 0 = No alarm 1 = Alarm on | 0 = No alarm |
| | | 15 | Window Opened | 0 = No alarm 1 = Alarm on | 0 = No alarm |
| 16 | Dehumidification Active | 0 = Off 1 = On | 0 = Off | | |
| Heating/ Cooling demand | network output SNVT_lev_percent nvoTerminalLoad | ➤ This output indicates the current heat/cool energy demand of the unit. Positive values indicate that cooling energy is in use by the space comfort controller, while negative values indicate that heating energy is in use by the space comfort controller. ➤ Valid Range: -100% to 100% | | | |

Configuration Properties (nci's) Description

| Parameter | Variable Name | Function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|----------------------|---|---------------|---------------|----|---------------|--|---------------|----|--------------|-----------------------------------|---------------|----|-----------------|-------------------------------|---------------|----|----------------------|---|---------------|----|--------------|---|---------------|----|-----------------|---|---------------|----|-----|---|---|----|-------------|------------------------------------|---|
| Temperature Setpoints | network input config SNVT_temp_setpt nciSetPts | <ul style="list-style-type: none"> ➤ This configuration property defines the space temperature setpoints for various heat, cool and occupancy modes. ➤ Valid Range and Default values: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>Sub</th> <th>Name</th> <th>Valid Range</th> <th>Default value</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>occupied_cool</td> <td>54 to 100°F (12 to 37.5°C)</td> <td>75°F (24.0°C)</td> </tr> <tr> <td>02</td> <td>standby_cool</td> <td>54 to 100°F (12 to 37.5°C)</td> <td>78°F (25.5°C)</td> </tr> <tr> <td>03</td> <td>unoccupied_cool</td> <td>54 to 100°F (12 to 37.5°C)</td> <td>80°F (26.5°C)</td> </tr> <tr> <td>04</td> <td>occupied_heat</td> <td>40 to 90°F (4.5 to 32°C)</td> <td>72°F (22.0°C)</td> </tr> <tr> <td>05</td> <td>standby_heat</td> <td>40 to 90°F (4.5 to 32°C)</td> <td>69°F (20.5°C)</td> </tr> <tr> <td>06</td> <td>unoccupied_heat</td> <td>40 to 90°F (4.5 to 32°C)</td> <td>62°F (16.5°C)</td> </tr> </tbody> </table> | Sub | Name | Valid Range | Default value | 01 | occupied_cool | 54 to 100°F (12 to 37.5°C) | 75°F (24.0°C) | 02 | standby_cool | 54 to 100°F (12 to 37.5°C) | 78°F (25.5°C) | 03 | unoccupied_cool | 54 to 100°F (12 to 37.5°C) | 80°F (26.5°C) | 04 | occupied_heat | 40 to 90°F (4.5 to 32°C) | 72°F (22.0°C) | 05 | standby_heat | 40 to 90°F (4.5 to 32°C) | 69°F (20.5°C) | 06 | unoccupied_heat | 40 to 90°F (4.5 to 32°C) | 62°F (16.5°C) | | | | | | | | |
| | | Sub | Name | Valid Range | Default value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 01 | occupied_cool | 54 to 100°F (12 to 37.5°C) | 75°F (24.0°C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 02 | standby_cool | 54 to 100°F (12 to 37.5°C) | 78°F (25.5°C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 03 | unoccupied_cool | 54 to 100°F (12 to 37.5°C) | 80°F (26.5°C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 04 | occupied_heat | 40 to 90°F (4.5 to 32°C) | 72°F (22.0°C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 05 | standby_heat | 40 to 90°F (4.5 to 32°C) | 69°F (20.5°C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 06 | unoccupied_heat | 40 to 90°F (4.5 to 32°C) | 62°F (16.5°C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RH options | network input config UNVT_gen_opts nciRHmodel | <ul style="list-style-type: none"> ➤ This configuration property defines the space humidity parameters and their settings. ➤ Valid Range and Default values: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>Sub</th> <th>Name</th> <th>Valid Range</th> <th>Default value</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>RHdisplay</td> <td>0 = Not active 1 = Active</td> <td>0</td> </tr> <tr> <td>02</td> <td>RHsetpoint</td> <td>30 to 100% RH</td> <td>50% RH</td> </tr> <tr> <td>03</td> <td>DehumHyst</td> <td>2 to 20% RH</td> <td>5% RH</td> </tr> <tr> <td>04</td> <td>DehumCool</td> <td>20 to 100% RH</td> <td>100% RH</td> </tr> <tr> <td>05</td> <td>RHcalib</td> <td>-15 to +15% RH</td> <td>0% RH</td> </tr> </tbody> </table> | Sub | Name | Valid Range | Default value | 01 | RHdisplay | 0 = Not active 1 = Active | 0 | 02 | RHsetpoint | 30 to 100% RH | 50% RH | 03 | DehumHyst | 2 to 20% RH | 5% RH | 04 | DehumCool | 20 to 100% RH | 100% RH | 05 | RHcalib | -15 to +15% RH | 0% RH | | | | | | | | | | | | |
| | | Sub | Name | Valid Range | Default value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 01 | RHdisplay | 0 = Not active 1 = Active | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 02 | RHsetpoint | 30 to 100% RH | 50% RH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 03 | DehumHyst | 2 to 20% RH | 5% RH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 04 | DehumCool | 20 to 100% RH | 100% RH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 05 | RHcalib | -15 to +15% RH | 0% RH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thermostat's common configuration parameters network input config | UNVT_fc_gen_opts nciGenOpts | <ul style="list-style-type: none"> ➤ This configuration property defines the thermostat's common configuration parameters and their settings. ➤ Valid Range and Default values: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>Sub</th> <th>Name</th> <th>Valid Range</th> <th>Default value</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>Control Type</td> <td>0 = On/Off Control 1 = Floating Control</td> <td>0</td> </tr> <tr> <td>02</td> <td>Drive Time</td> <td>0.5 to 9 minutes (0.5 increments)</td> <td>3 minutes</td> </tr> <tr> <td>03</td> <td>Cycles Per Hour</td> <td>3, 4, 5, 6, 7 and 8 CPH</td> <td>4 CPH</td> </tr> <tr> <td>04</td> <td>ReverseActing Output</td> <td>0 = Direct Acting (DA) 1 = Reverse Acting (RA)</td> <td>0</td> </tr> <tr> <td>05</td> <td>BI1</td> <td>0 = None 1 = Rem NSB 2 = Motion NO 3 = Motion NC 4 = Window</td> <td>0</td> </tr> <tr> <td>06</td> <td>BI2</td> <td>0 = None 1 = Door Dry 2 = Override 3 = Filter 4 = Service</td> <td>0</td> </tr> <tr> <td>07</td> <td>UI3</td> <td>0 = None 1 = COC/NH 2 = COC/NC 3 = COS 4 = SS</td> <td>0</td> </tr> <tr> <td>08</td> <td>Menu Scroll</td> <td>0 = No Scroll 1 = Scroll Active</td> <td>1</td> </tr> </tbody> </table> | Sub | Name | Valid Range | Default value | 01 | Control Type | 0 = On/Off Control 1 = Floating Control | 0 | 02 | Drive Time | 0.5 to 9 minutes (0.5 increments) | 3 minutes | 03 | Cycles Per Hour | 3, 4, 5, 6, 7 and 8 CPH | 4 CPH | 04 | ReverseActing Output | 0 = Direct Acting (DA) 1 = Reverse Acting (RA) | 0 | 05 | BI1 | 0 = None 1 = Rem NSB 2 = Motion NO 3 = Motion NC 4 = Window | 0 | 06 | BI2 | 0 = None 1 = Door Dry 2 = Override 3 = Filter 4 = Service | 0 | 07 | UI3 | 0 = None 1 = COC/NH 2 = COC/NC 3 = COS 4 = SS | 0 | 08 | Menu Scroll | 0 = No Scroll 1 = Scroll Active | 1 |
| | | Sub | Name | Valid Range | Default value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 01 | Control Type | 0 = On/Off Control 1 = Floating Control | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 02 | Drive Time | 0.5 to 9 minutes (0.5 increments) | 3 minutes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 03 | Cycles Per Hour | 3, 4, 5, 6, 7 and 8 CPH | 4 CPH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 04 | ReverseActing Output | 0 = Direct Acting (DA) 1 = Reverse Acting (RA) | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 05 | BI1 | 0 = None 1 = Rem NSB 2 = Motion NO 3 = Motion NC 4 = Window | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 06 | BI2 | 0 = None 1 = Door Dry 2 = Override 3 = Filter 4 = Service | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 07 | UI3 | 0 = None 1 = COC/NH 2 = COC/NC 3 = COS 4 = SS | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 08 | Menu Scroll | 0 = No Scroll 1 = Scroll Active | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Parameter | Variable Name | Function | | | |
|---|--------------------------------|----------|--------------------------|---|--------------------------------|
| | | Sub | Name | Valid Range | Default value |
| Thermostat's common configuration parameters network input config | UNVT_fc_gen_opts nciGenOpts | 09 | Auto Mode | 0 = Not Active 1 = Active | 0 |
| | | 10 | Temperature Scale | 0 = °C 1 = °F | °F |
| | | 11 | Pipes # Main out config | 2 = 2 pipe 4 = 4 pipe | 4 pipe |
| | | 12 | Sequence of Operation | 0 = Cooling Only 1 = Heating Only 2 = Cooling & Reheat 3 = Heating & Reheat 4 = Cooling/Heating 4 pipes 5 = Cooling /Heating 4 pipes & Reheat | 1 = Heating Only |
| | | 13 | Fan Menu | 0 = Low-Med-High 1 = Low-High 2 = Low-Med-High-Auto 3 = Low-High-Auto 4 = On-Auto | 4 = On-Auto |
| | | 14 | Heat Maximum Setpoint | 40 to 90°F (4.5 to 32°C) | 90°F (32°C) |
| | | 15 | Cool Minimum Setpoint | 54 to 100°F (12 to 37.5°C) | 54°F (12°C) |
| | | 16 | Setpoint Type | 0 = Permanent 1 = Temporary | 0 |
| | | 17 | Temporary Occ Time | 0, 1, 2, 3, up to 24 hours | 2 hours |
| | | 18 | Deadband | 2, 3, 4 or 5 °F (1 to 2.5°C) | 2°F (1°C) |
| | | 19 | Calibration Room Sensor | ± 5°F (±2.5°C) | 0°C |
| | | 20 | Auxiliary Contact Config | 0 = Aux Contact used for reheat 1 = Aux NO with occupancy 2 = Aux NC with occupancy 3 = Aux NO with occupancy & Fan On 4 = Aux NC with occupancy & Fan On 5 = Remote control nviAucOut | 0 |
| | | 21 | Reheat Time Base | 0 = 15 minutes 1 = 10 seconds | 0 |
| | | 22 | Fan Mode | 0 = Low 1 = Med 2 = High 3 = Auto 4 = On | Depending on Fan Menu Selected |
| | | 23 | PIR Stand-By Timer | 0.5 to 24.0 Hours | 0.5 Hours |
| | | 24 | PIR Unoccupied Timer | 0.0 to 24.0 Hours | 0.0 Hours |

| Parameter | Variable Name | Function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------|---|---|----------------------------|-------------|---------------|---------------|-------------------------------|------------------|---|----------------------------|----------|------------------|---------------------------|------------------------------|---|--------------------------------|-----------|---|-------------------------------|--------------|---|---------------------------------|-----------------|---|---------------------------------|-----------------|---|--------------------------------|----------|---|---------------------------|-------------------|---|--------------------------------|---------------------|
| Thermostat's model number | network input config UNVT_model_number nciSccModel | <ul style="list-style-type: none"> ➤ This configuration property defines model number and software version of the thermostat ➤ Valid Range and Default values: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>Sub</th> <th>Name</th> <th>Valid Range</th> <th>Default value</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>Thermostat Model</td> <td>41 = VT7300A1000E 42 = VT7305A1000E 43 = VT7350C1000E 44 = VT7300C1000E 45 = VT7355C1000E 46 = VT7305C1000E 47 = VT7350F1000E 48 = VT7300F1000E 49 = VT7355F1000E 50 = VT7305F1000E 51 = VT7350M1000E</td> <td>Depend on model being used</td> </tr> <tr> <td>02</td> <td>Software Version</td> <td>0</td> <td>0</td> </tr> </tbody> </table> | Sub | Name | Valid Range | Default value | 01 | Thermostat Model | 41 = VT7300A1000E 42 = VT7305A1000E 43 = VT7350C1000E 44 = VT7300C1000E 45 = VT7355C1000E 46 = VT7305C1000E 47 = VT7350F1000E 48 = VT7300F1000E 49 = VT7355F1000E 50 = VT7305F1000E 51 = VT7350M1000E | Depend on model being used | 02 | Software Version | 0 | 0 | | | | | | | | | | | | | | | | | | | | | |
| | | Sub | Name | Valid Range | Default value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01 | Thermostat Model | 41 = VT7300A1000E 42 = VT7305A1000E 43 = VT7350C1000E 44 = VT7300C1000E 45 = VT7355C1000E 46 = VT7305C1000E 47 = VT7350F1000E 48 = VT7300F1000E 49 = VT7355F1000E 50 = VT7305F1000E 51 = VT7350M1000E | Depend on model being used | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 02 | Software Version | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HVAC Unit-Type Identifier | network input config SNVT_hvac_type nciHvacType | <ul style="list-style-type: none"> ➤ This configuration property helps the user identify the type of equipment being monitored. ➤ Valid Range: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>Sub</th> <th>Identifier</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>HVT_GENERIC – Not Used</td> <td>Generic</td> </tr> <tr> <td>1</td> <td>HVT_FAN_COIL</td> <td>Fan Coil</td> </tr> <tr> <td>2</td> <td>HVT_VAV – Not Used</td> <td>Variable Air Volume Terminal</td> </tr> <tr> <td>3</td> <td>HVT_HEAT_PUMP– Not Used</td> <td>Heat Pump</td> </tr> <tr> <td>4</td> <td>HVT_ROOFTOP – Not Used</td> <td>Rooftop Unit</td> </tr> <tr> <td>5</td> <td>HVT_UNIT_VENT – Not Used</td> <td>Unit Ventilator</td> </tr> <tr> <td>6</td> <td>HVT_CHIL_CEIL – Not Used</td> <td>Chilled Ceiling</td> </tr> <tr> <td>7</td> <td>HVT_RADIATOR – Not Used</td> <td>Radiator</td> </tr> <tr> <td>8</td> <td>HVT_AHU – Not Used</td> <td>Air Handling Unit</td> </tr> <tr> <td>9</td> <td>HVT_SLF_CONT – Not Used</td> <td>Self-Contained Unit</td> </tr> </tbody> </table> | Sub | Identifier | Name | 0 | HVT_GENERIC – Not Used | Generic | 1 | HVT_FAN_COIL | Fan Coil | 2 | HVT_VAV – Not Used | Variable Air Volume Terminal | 3 | HVT_HEAT_PUMP– Not Used | Heat Pump | 4 | HVT_ROOFTOP – Not Used | Rooftop Unit | 5 | HVT_UNIT_VENT – Not Used | Unit Ventilator | 6 | HVT_CHIL_CEIL – Not Used | Chilled Ceiling | 7 | HVT_RADIATOR – Not Used | Radiator | 8 | HVT_AHU – Not Used | Air Handling Unit | 9 | HVT_SLF_CONT – Not Used | Self-Contained Unit |
| | | Sub | Identifier | Name | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | HVT_GENERIC – Not Used | Generic | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | HVT_FAN_COIL | Fan Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | HVT_VAV – Not Used | Variable Air Volume Terminal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | HVT_HEAT_PUMP– Not Used | Heat Pump | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | HVT_ROOFTOP – Not Used | Rooftop Unit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | HVT_UNIT_VENT – Not Used | Unit Ventilator | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | HVT_CHIL_CEIL – Not Used | Chilled Ceiling | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | HVT_RADIATOR – Not Used | Radiator | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | HVT_AHU – Not Used | Air Handling Unit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | HVT_SLF_CONT – Not Used | Self-Contained Unit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Maximum Send Time | network input config SNVT_time_sec nciSendHrtBt | <ul style="list-style-type: none"> ➤ This configuration property defines the maximum period of that expires before the specified network variable outputs will automatically be updated ➤ Valid Range: 0 sec. to 6553.4 sec.. Setting nciSendHrtBt to 0 disables the Send Heartbeat mechanism. ➤ Default Null Value : 0.0 sec (no automatic update) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Minimum Send Time | network input config SNVT_time_sec nciMinOutTm | <ul style="list-style-type: none"> ➤ This configuration property defines the minimum period of time between automatic network variable outputs transmissions. ➤ Valid Range: 0 sec. to 6553.4 sec.. Setting nciRcvHrtBt to 0 disables the Minimum Send Time mechanism. ➤ Default Null Value : 0.0 sec (no minimum send time) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Minimum Receive Time | network input config SNVT_time_sec nciRcvHrtBt | <ul style="list-style-type: none"> ➤ This configuration property is used to control the maximum time that elapses after the last update to a specified network variable input before the Space Comfort Controller starts to use its default values. ➤ Valid Range: 0 sec. to 6553.4 sec.. Setting nciRcvHrtBt to 0 disables the Receive Heartbeat mechanism. ➤ Default Null Value : 0.0 sec (no failure detected) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hardware or Software revisions | network input config SCPT_maj_ver nciMajVer | <ul style="list-style-type: none"> ➤ This configuration property defines the major module hardware and software revisions. ➤ Valid Range: 0 to 255 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hardware or Software revisions | network input config SCPT_min_ver nciMinVer | <ul style="list-style-type: none"> ➤ This configuration property defines the minor module hardware and software revisions. ➤ Valid Range: 0 to 255 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Note 1:

How to use nviHeatCool, nviAuxHeatEnable and SeqOpera (Sequence of Operation) variables:

| Current nviHeatCool | NviAuxHeat Enable = Enabled | NviAuxHeat Enable = Disabled | Current SeqOpera | If nviHeatCool changed to: | New SeqOpera |
|---------------------------|-----------------------------|------------------------------|---------------------------|------------------------------|---|
| 2 Pipe Application | | | | | |
| 3 = HVAC_COOL | | X | 0 = Cooling Only | 1= HVAC_HEAT | 1 = Heating Only |
| 3 = HVAC_COOL | X | | 2 = Cooling & Reheat | 1= HVAC_HEAT | 3 = Heating & Reheat |
| 1 = HVAC_HEAT | | X | 1 = Heating Only | 3= HVAC_COOL | 1 = Cooling Only |
| 1 = HVAC_HEAT | X | | 3 = Heating & Reheat | 3= HVAC_COOL | 2 = Cooling & Reheat |
| 4 Pipe Application | | | | | |
| 3 = HVAC_COOL | | X | 0 = Cooling Only | 0= HVAC_AUTO 1= HVAC_HEAT | 4 = Cool/Heat 4 Pipes 1 = Heating Only |
| 3 = HVAC_COOL | X | | 2 = Cooling & Reheat | 0= HVAC_AUTO 1= HVAC_HEAT | 5 = Cool/Heat 4P & Reheat 3 = Heating & Reheat |
| 1 = HVAC_HEAT | | X | 1 = Heating Only | 0= HVAC_AUTO 3= HVAC_COOL | 4 = Cool/Heat 4 pipes 1 = Cooling Only |
| 1 = HVAC_HEAT | X | | 3 = Heating & Reheat | 0= HVAC_AUTO 3= HVAC_COOL | 5 = Cool/Heat 4P & Reheat 2 = Cooling & Reheat |
| 0 = HVAC_AUTO | | X | 4 = Cool/Heat 4 Pipes | 1= HVAC_HEAT 3= HVAC_COOL | 1 = Heating Only 0 = Cooling Only |
| 0 = HVAC_AUTO | X | | 5 = Cool/Heat 4P & Reheat | 1= HVAC_HEAT 3= HVAC_COOL | 3 = Heating & Reheat 2 = Cooling & Reheat |

Integration – Global Commands

The following figure shows, which objects from the thermostat, can be monitored and commanded from the BAS front-end.

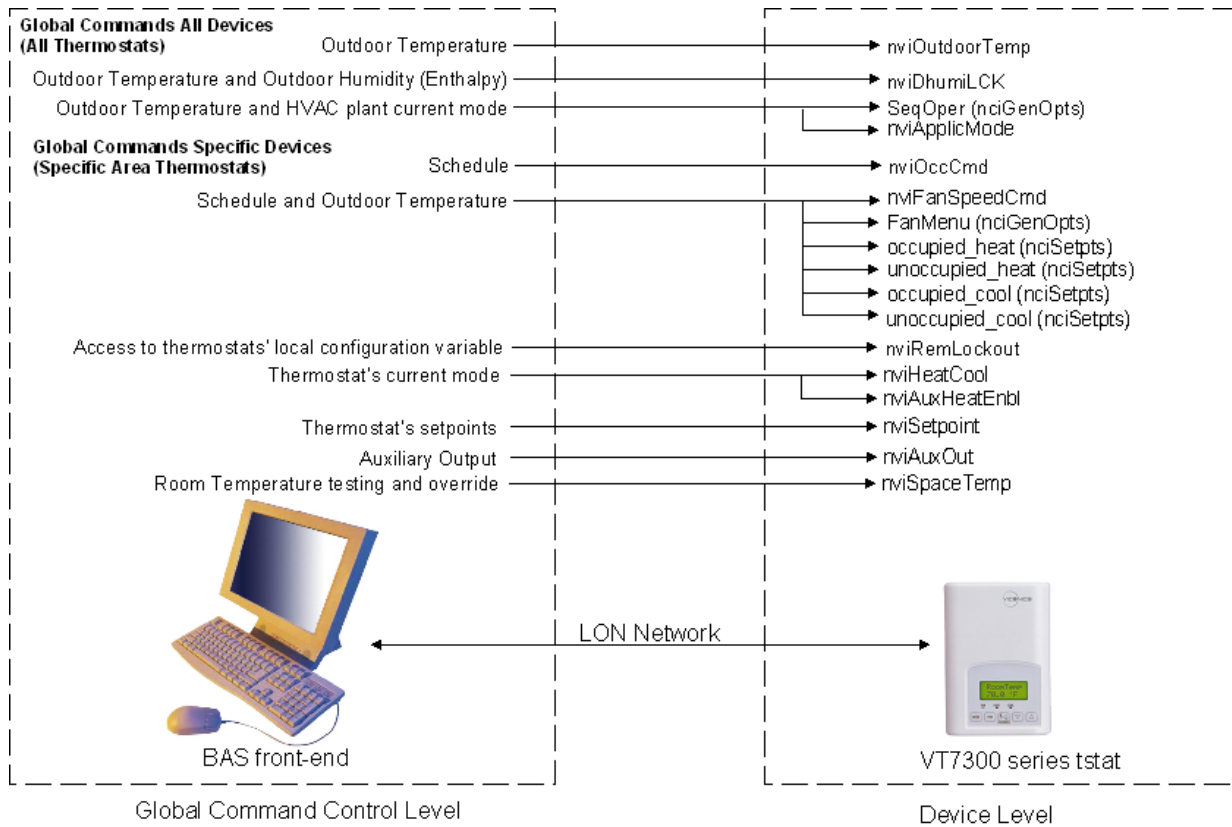


Figure 1: Global commands from a BAS front-end to a VT7300 series tstat

Integration – Graphic User Interface (GUI) Objects

The following objects should be typically used in a GUI:

- nvoSpaceTemp
- occupied_heat (nciSetpts);
- unoccupied_heat (nciSetpts);
- occupied_cool (nciSetpts);
- unoccupied_cool (nciSetpts);
- nvoSpaceRH
- RHsetpoint (nciRHmodel);
- nvoOutdoorTemp
- nvoDischAirTemp
- nviOccManCmd
- nvoEffectOccup
- heat_output_primary (nvoUnitStatus)
- cool_output (nvoUnitStatus)
- ServiceAlarm (nvoScStatus)
- FilterAlarm (nvoScStatus)
- WindowOpened (nvoScStatus)

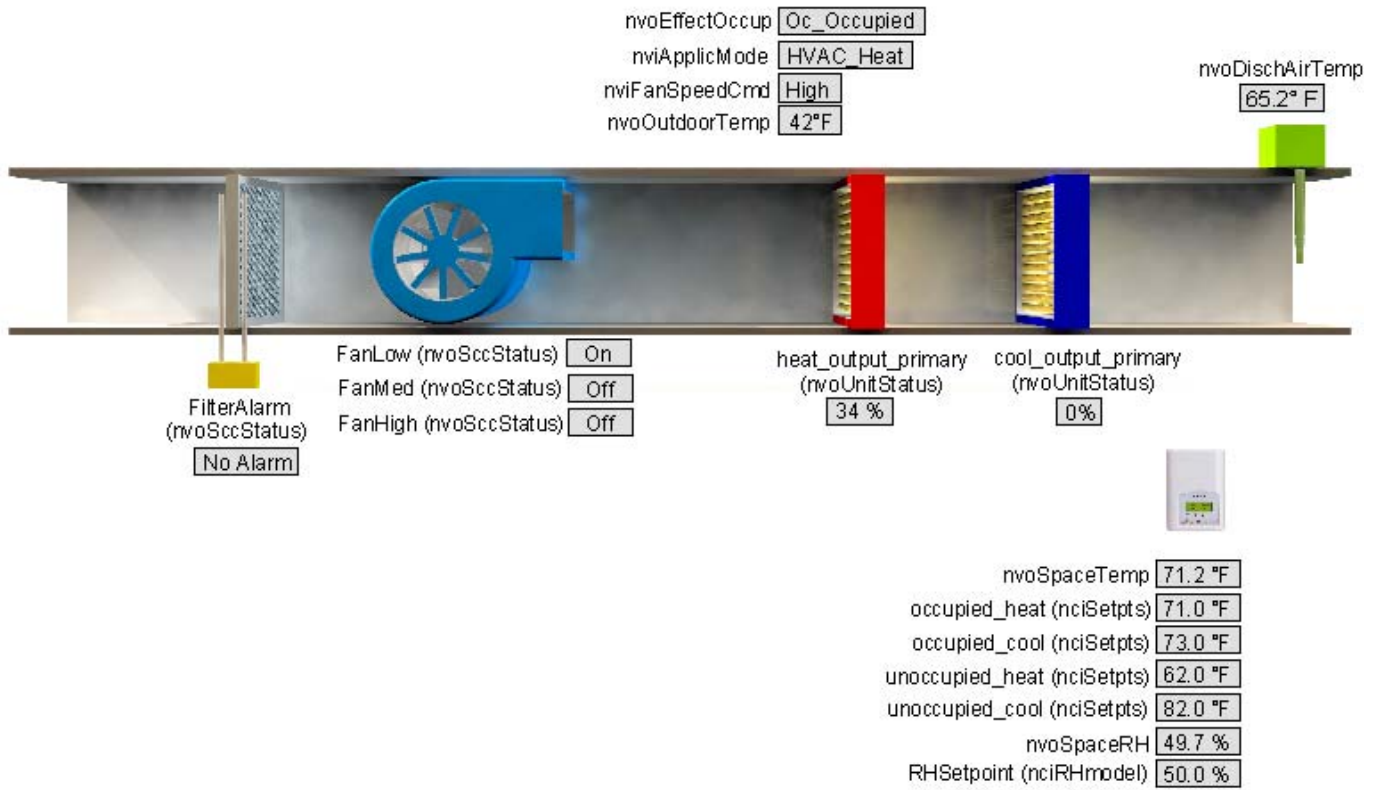


Figure 2: Graphical User Interface (GUI) example of a Fan-Coil system

Configuration Objects

The following SNVT and UNVT should be typically used for configuration purposes:

- nciGenOpts;
- nciRHmodel;
- nciSetpoints;

Wiring Guide

Overview

For clarity we will use the term “Device” to represent any product with an active Echelon network connection, including Viconics and non-Viconics controllers.

Summary Specifications:

| Parameter | Details |
|---|---|
| Network Wiring | 24 to 16AWG, twisted pair |
| Maximum total wire length ¹ | 1600 feet (500 meters) in free topology |
| Maximum device-to-device distance | 1600 feet (500 meters) in free topology |
| Polarity | Polarity insensitive |
| Multi-drop | Free Topology |
| Termination for Free Topology Network Segment | One RC network with $R_a = 52.3\Omega \pm 1\%$, 1/8W |
| Termination for Doubly Terminated Bus Network Segment | Two RC network with $R_a = 105\Omega \pm 1\%$, 1/8W |
| Number of transceivers per segment | Up to 64 |
| Baud rate | 78000 bits per second |

¹Network segment length varies depending on wire type.

Table 1: Summary of Specifications for a Viconics' LON Network

Network Configuration

The Echelon network is designed to support free topology wiring and will accommodate bus, star, loop or any of these topologies. Echelon devices can be located at any point along the network wiring.

Figures 3.1 to 3.5 present five different network topologies. The actual termination circuit will vary by application.



Figure 3.1 Singly Terminated Bus Topology



Figure 3.2 Doubly Terminated Bus Topology

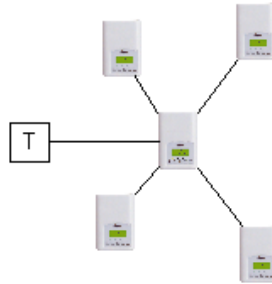


Figure 3.3 Star Topology

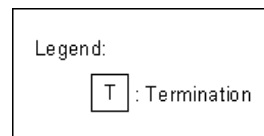
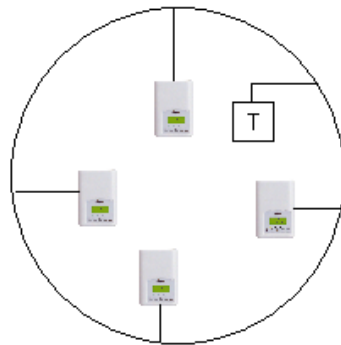


Figure 3.4 Loop Topology

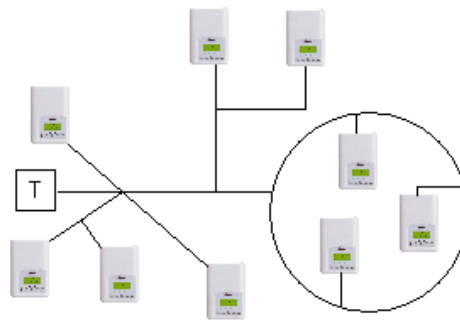


Figure 3.5 Mixed Topology

Maximum Number Of Devices

Up to 64 transceivers are allowed per network segment. If your network requires more than 64 transceivers a repeater is then required to extend your network

Maximum Cable Length

The maximum length of a chain is related to its transmission speed. The longer the chain, the slower the speed. Using proper cable, Echelon supports a baud rate of 78 kilobits per second for distances up to 1600-ft (500 m) in free topology and 8800 ft (2700 m) in bus topology with double terminations.

If you require a maximum network length of more than 1600-ft (500 m) or 8800 ft (2700 m), then a repeater is required to extend the network.

Repeater

In the event that the limits on the number of transceivers or total wire distance are exceeded, a physical layer repeater can be added to interconnect two or more network segments. A repeater will double the overall channel capability, including node count and network extent, but not bandwidth. Note that only one physical layer repeater should be placed in series between any two nodes on a channel. If additional cabling or network bandwidth is required, then a LonWorks Router should be used in place of a repeater.

Terminators

Echelon network segments requires termination for proper data transmission performance. The type of terminator varies depending on whether shielded or unshielded cable is used. Free topology and Bus networks also differ in their termination requirements. The following sections describe the various terminators and terminations procedure.

Free Topology Network Segment

In a free topology segment, only one termination is required and may be placed anywhere on the free topology segment. There are two choices for the termination:

1. RC network with $R_a = 52\Omega \pm 1\%$, 1/8W
2. LPI-10 Link Power Interface, with jumper at "1 CPLR" setting.

Doubly Terminated Network Segment

In a doubly terminated bus topology, two terminations are required, one at each end of the bus. There are two choices for each termination:

1. RC network with $R_a = 105\Omega \pm 1\%$, 1/8W
2. LPI-10 Link Power Interface, with jumper at "2 CPLR" setting.

Only one LPI-10 interface is supported per segment. The other terminator must be an RC-type.

Grounding Shielded Twisted Pair Cable

When using Shielded Twisted Pair, terminate the twisted pair as listed in the previous section and ground the cable shield by using a capacitor, to tie the shield to earth ground, and a large-value resistor to bleed off any static charge on the shield. Tying the shield to earth ground through a capacitor will avoid DC and 50/60Hz ground paths from being formed through the shield. Typical values for resistor and capacitor are as follows:

Capacitor = 0.1 μ F, 10%, Metalized Polyester, $\geq 100V$
Resistor = 470k Ω , 1/4W, $\pm 5\%$

The cable shield should be grounded at least once per segment, and preferably at each node. Grounding the shield at every node will assist in suppressing 50/60Hz standing waves.

Network adapter

Although network connections are polarity insensitive, it is good practice to keep polarity consistent throughout the entire site. Figure 4 shows a network connection example and the location of the Status LED. This Status LED may help to troubleshoot network problems.

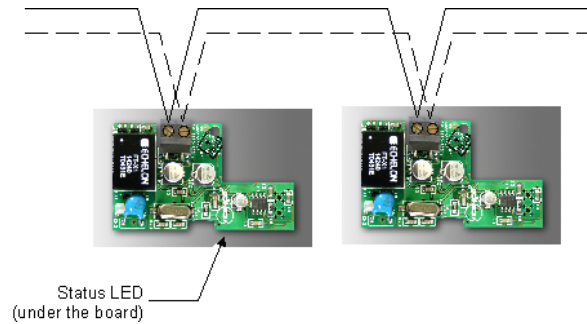


Figure 4: Network connections and location of the Status LED on a LON module

Table 2 shows the different possibilities with the Status LED behaviour of the LON module.

| Condition of the Status LED | Explanation |
|-------------------------------|--|
| ➤ Continuously ON | The device has no application loaded in its memory and is Un-configured |
| ➤ Flashing at a rate of 1/2Hz | The device has an application loaded in its memory but is Un-configured. When a device is in the un-configured state, it does not know which devices to communicate with. A network management tool is used to logically bind the node to another in a LonWorks network. |
| ➤ Continuously OFF | The device has an application loaded into its memory and is bound onto a LonWorks network. |

Table 2: Status LED condition

Software Files

XIF: When binding a node onto the network, an XIF file is needed. The XIF file has information that is used by the network management tool to help ease the installation and maintenance process of a node. It is also used for offline configuration of the node.

APB and NXE: When running an application program associated with a XIF file, an APB or NXE file is needed. Please note that the thermostats have the APB file already flashed from the factory.

Device Resource File (DRF): When a LON network management tool is used; a DRF file must be installed. DRF files are needed to display special manufacturer defined variables or configurations correctly.

- Please note that all release notes for the XIF, APB & NXE software files will be included under the following folder name on your hard drive: C:\LonWorks\Import\Viconics. The name of the file is: VT7xxxReadme.txt

Plug-Ins File: Plug-Ins simplify start-up, maintenance, configuration and reduce the installation effort.

- Please note that all release notes for Plug-Ins files will be included under the following folder name on your hard drive: C:\LonWorks\Plug-Ins\Viconics\VT7xxx. The name of the file is: Readme.txt.
- All the latest software files can be downloaded from VICONICS' web site at <http://www.viconics.com>

RoHS & Non-RoHS APB and NXE Files

In July of 2006, new APB and NXE files were introduced to support new RoHS compliant components from Echelon Corporation. **Those APB and NXE software revisions are not backward compatible** and some care and attention must be taken to assure you are utilizing the correct revision during the commissioning procedure. Please note that the thermostats already have the proper file flashed from the factory.

In order to differentiate non-RoHS and RoHS software, a new PID has been issued for each new RoHS software as shown in Figure 5.

Your LNS systems already have a built in protection against firmware mismatch and will refuse any upload from non-RoHS software to a RoHS device or vice-versa. The PID change has been instituted in order to prompt an “incompatibility” message from your Niagara based system.

| Product Name | Model Number | RoHS Marking | VT72/7300 Lontalk Firmware | VT7600 Lontalk Firmware |
|---------------------------------|--------------|------------------------------|----------------------------|-------------------------|
| FT-X1 Communication Transformer | 14240R | Encircled "e1" added to mark | 80:00:C5:55:00:04:04:1B | 80:00:C5:55:00:04:04:12 |
| FT-X1 Communication Transformer | 14240 | None | 80:00:C5:55:00:04:04:0B | 80:00:C5:55:00:04:04:02 |

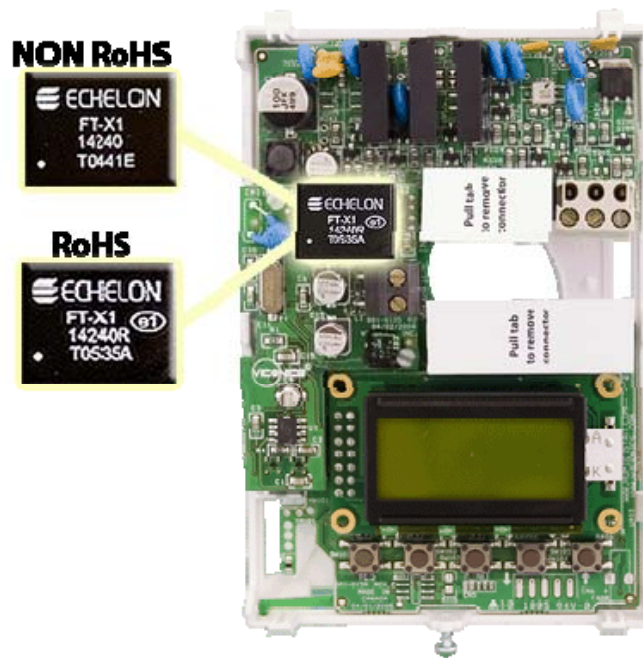


Figure 5: RoHS and Non-RoHS Marking and Program IDs

XIF, APB and NXE File Names and Corresponding PIDs

| Used on thermostat | XIF file names | APB / NXE file names | Associated PID |
|------------------------------------|----------------|----------------------|-------------------------|
| Non-RoHS VT7200 / VT7300 Series | T7X-FC.XIF | T7X-FC.APB | 80:00:C5:55:00:04:04:0B |
| RoHS VT7200 / VT7300 Series | T7X-FCr.XIF | T7X-FCr.APB | 80:00:C5:55:00:04:04:1B |
| RoHS PIR VT7200 / VT7300 Series ** | T7X-FC-PIR.XIF | T7X-FC-PIR.APB | 80:00:C5:55:00:04:04:1D |

** Please note that all new PIR ready thermostat series of the VT7200 / VT7300 thermostat family will use the latest released files to properly use all the new advanced occupancy functions associated with a local PIR accessory cover installed on the thermostat.

Device Identification

An Echelon device has a unique mechanism to identify itself, the Neuron ID, which is obtained during commissioning.

There are two ways of getting the Neuron ID: with a Service Pin or manually.

Service PIN

The service pin is used to identify the device at commissioning. By pressing simultaneously the “Up” button and the “Down” button located on the keypad interface of a VT7300 device, the program ID and the Neuron ID (LonWorks Unique ID) contained in the device are transmitted to the commissioning or service tool. The Status LED will blink when the device accepts the Service Pin command.

Figures 6 and 7 show an example of a Service PIN request made through a commissioning tool

The screenshot shows a software window titled "Add device" with a close button in the top right corner. The window is divided into several sections. The first section, "New Device Name", has a text box labeled "Device name:" containing the text "Device1". The second section, "Device Identification Method", features a dropdown menu currently set to "Service Pin" and a "Get" button next to a "Neuron ID:" text box. Below this are three sub-sections: "Commission" with a checked checkbox for "Commission Device", "Location" with an empty text box, and "Ping Interval" with a dropdown menu set to "2 minutes". A red instruction text reads "Click 'Get' button to begin ServicePin method." At the bottom of the window are three buttons: "< Back", "Finish", and "Cancel".

Figure 6: Service Pin request through a commissioning tool

The screenshot shows a software window titled "Press Service Pin" with a close button in the top right corner. The main area of the window contains the text "Press the Service Pin on the device you wish to install!" in blue. At the bottom right of the window is a "Cancel" button.

Figure 7: Service Pin request through a commissioning tool

Manual Identification

Neuron ID of a device can also be entered manually through a commissioning or service tool. Neuron ID should be located on the Echelon chip of the device being commissioned.

Figure 8 shows an example of a Manual Neuron ID request made through a commissioning tool.

Figure 8: Manual Neuron ID request

Tips And Things You Need To Know

- In order to operate nviAuxOut (auxiliary output) from the network, Aux contact configuration (Auxcont nciGenOpt) needs to be set as “Network Controlled”;
- If the heartbeat is lost, the module will release the network sensor value for the Room Temperature (nviSpaceTemp) and the Outdoor Temperature (nviOutdoorTemp);
- The SeqOpera value (Sequence of Operation) depends on the nviHeatCool value and nviAuxHeatEnable value. See note 1 on page 15 for all the details;

Troubleshooting Section

| Error / Trouble Condition | Possible Cause | Solution |
|--|--|---|
| Thermostat does not come online | The LON network has too many devices. | Do not exceed the maximum number of devices and maximum length allowed by the EIA-485 specifications. |
| | Too many devices were installed without any repeaters. | Repeaters need to be installed as specified in this document. |
| | The LON cable runs are broken | Locate the break and correct wiring |
| | The thermostat does not have power | Apply power to the thermostat |

Document Control

Document Name: ITG-VT7300-PIR-LON E06
 Document Filename: ITG-VT7300-PIR-LON E06.pdf

| Revision | Date | Changes |
|----------|-----------------|--|
| 01 | January 4, 2006 | Created to coincide with release of the VT7300 as a LonMark certified product. |
| 02 | April 5, 2006 | Updated the DRF files section and removed any application guide reference |
| 03 | July 11, 2006 | Modified the Software Files section and added the RoHS / Non-RoHS section |
| 04 | Aug 15, 2006 | Modified Note 1 on page 15 |
| 05 | Nov 21, 2007 | Added modifications required for PIR support to the new VT73xxX5xxxE release |
| 06 | Jan 21, 2008 | Added additional modifications required for PIR support |