

**Using Enerzone StatNet Thermostats with HomeVision**

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## **OVERVIEW**

Enerzone makes a variety of popular Slim Line thermostats. They can be connected to a computer serial port through an add-on product called StatNet. The HomeVision controller can interface with the StatNets through the PC. The StatNets are connected to one PC serial port, and HomeVision to another. HomeVision software running on the PC then interfaces the two ports together. This provides the following capabilities:

- The HomeVision controller can send commands to the StatNets to change:
  - Run/Hold mode (also called Day/Night mode)
  - System mode (Heat, Cool, Auto, Off)
  - Fan mode (On, Auto)
  - Temperature setpoint
  - LED states
- The HomeVision PC software screen can also change the first four items listed above.
- The HomeVision PC software screen displays the current StatNet settings.
- The HomeVision controller knows the current StatNet settings.

The following discussion assumes you're familiar with the StatNet operation. Refer to the StatNet documentation as necessary.

## **COMMUNICATIONS METHOD OVERVIEW**

It's important to understand how the HomeVision controller, the PC software, and the StatNets communicate. Here's an example. Let's say you're displaying the zone 1 thermostat control screen on your TV. You use your infrared remote to change the temperature setpoint to 75 degrees, then press the "Enter" key. Here's what happens:

- 1) The HomeVision controller sends the command to the PC serial port. Note that the controller leaves its internal temperature setpoint value unchanged (i.e., it does not change to the new value you just entered).
- 2) The HomeVision PC software receives the command and sends it to the StatNet.
- 3) When the StatNet receives the command, it executes it and reports the new setting back to the PC.
- 4) The HomeVision PC software receives the StatNet message and updates its internal variables. If the PC Thermostat Control Screen is being displayed, the new setting will be shown there. The software then sends the new setting to the HomeVision controller.
- 5) When the controller receives the new setting, it updates its internal setpoint variable. Finally, the new setpoint appears on the TV screen.

Obviously, accomplishing this requires that HomeVision, the StatNets, and the PC be properly configured and running. The setup is described in the next section.

## **SYSTEM SETUP**

We recommend you first set up the StatNets and get them working independently of HomeVision. Refer to the StatNet documentation for details. **The StatNet addresses must be numbered sequentially**

**starting at 1 (i.e., if you have 4 StatNets, their addresses must be 1, 2, 3, and 4).** You should first use a terminal emulator program to ensure the PC can communicate with the StatNets.

After the StatNets are functioning, proceed as follows:

- 1) Connect the HomeVision controller to a PC serial port.
- 2) Start the HomeVision software on the PC.
- 3) Open your schedule file (or start a new one).
- 4) Ensure the software is accessing the correct HomeVision serial port (with the Serial Interface Configuration Screen).
- 5) Open the Thermostat Configuration Screen:
  - Select "StatNet connected to PC" in the first list box
  - Select the number of StatNet zones in the second list box
  - Select the StatNet serial port in the third list box
  - Click "OK"

The software will then attempt to initialize the StatNets and report the results to you. If it reports an error, verify that StatNets are connected, running, and properly addressed.

- 6) Save your schedule file.
- 7) Load your schedule into the controller.
- 8) Test the system, as described next.

### **TESTING THE STATNETS**

To test the StatNets, open the Thermostat Control Screen in the PC software and the Zone 1 Thermostat Control Screen in the TV video menu system. Then:

- Change a setting from the PC Thermostat Control Screen. Verify the StatNet changes properly. Verify the TV control screen displays the new setting. Note that there may be an occasional delay of several seconds before the response is received.
- Change a setting from the TV Thermostat Control Screen. Verify the StatNet changes properly. Verify the PC control screen displays the new setting. Once again, there may be an occasional delay.
- Change a setting on the StatNet. Verify the PC and TV control screens display the new setting. Note that because of the way the StatNets report local changes, there will normally be a delay of up to 9 seconds before the change is reported.

At this point, you know that everything is up and running OK. Now you simply need to decide how you want to automate the StatNets.

### **USING THE STATNETS**

The HomeVision owner's manual explains the many HomeVision thermostat control features. All of these work with the StatNets. Therefore, you should read the thermostat chapter as you decide how you want your system to work.

There are a number of unique things about the StatNets that are not covered in the HomeVision owner's manual. It's important that you understand the following items.

### **StatNet Initialization**

- The HomeVision software initializes the StatNets in the following situations:
  - Each time a schedule file that has the StatNets enabled is opened
  - Whenever you click OK on the Thermostat Configuration Screen when StatNets are selected
  - Whenever you click "Init StatNets" on the Thermostat Control Screen
  - Whenever commanded to from the HomeVision controller (you can use the Initialize Thermostat command in your schedule to do this)

Note that if the HomeVision controller isn't connected when the PC tries to initialize the StatNets, there will be a delay of perhaps 20 seconds before the software gives up.

- HomeVision makes the following StatNet settings during the initialization process:
  - The Command Response Control Mode is set to Normal
  - All eight Change Of State (COS) Notify Commands are turned On
  - The Temperature Scale is set based on the Fahrenheit/Centigrade setting in the HomeVision Controller Settings Screen (under the Other tab)

After making these settings, the software reads the following settings from the StatNet and reports them to the HomeVision controller:

- Run/Hold (Day/Night) mode
  - System mode (Heat, Cool, Auto, Off)
  - Fan mode (On, Auto)
  - Temperature setpoint
  - Current temperature
- The StatNets lose their Change Of State settings when power is removed. Therefore, the StatNets should be reinitialized after a power failure. You can do this by putting an Initialize Thermostat command in HomeVision's power failure recovery event. Of course, this only works if your computer is on a UPS and is running when HomeVision's power is restored. If your computer shuts down, you should set it up to automatically reboot and start your HomeVision schedule. When HomeVision restarts and opens your schedule, it will automatically reinitialize the settings, and you don't need to do anything else.

### **StatNet Communications Details**

The following information is important for understanding how best to use the StatNets with HomeVision:

- The following changes made manually at the thermostat are reported back to the PC software, forwarded to the HomeVision controller, and handled automatically by the controller:
  - Run/Hold (Day/Night) mode

- System mode (Heat, Cool, Auto, Off)
- Fan mode (On, Auto)
- Current temperature

Because these are handled automatically by HomeVision, you normally don't need to do anything special. The following comments apply to those "power users" who wish to add even more capabilities.

These StatNet messages are not transmitted to the controller in the same format as they're received from the StatNet. Instead, the PC software deciphers the message, then sends the appropriate "HomeVision Thermostat Command" to the controller. Therefore, you cannot use HomeVision's Serial Data Input Event to detect these messages. If you need to know when one of these settings changes, you will have to write special commands to store the current setting and look for changes. You'd do this by creating a variable or flag to hold the current state of each setting of interest. Then you'd have a periodic event running every loop that compares that flag or variable to the new setting. If they're different, you know the setting changed, so you store the new setting in the variable or flag, then take whatever actions you want.

- Temperature setpoint changes act similar to the other settings discussed in the previous paragraph, with one exception. The PC will also send a message to the controller in this format:

```
STATNET ZONE # SETPOINTS: HEAT=hh COOL=cc
```

where: # is the zone number  
 hh is the heat mode setpoint  
 cc is the cool mode setpoint

This message allows you to track the StatNet's individual Heat and Cool temperature setpoints if you so desire. The following example shows how to do this. Place the following commands in the Serial Data Input Event:

```
If
  Serial input characters number 1-24 are 'STATNET ZONE 1 SETPOINTS'
Then
  Put value of received serial characters # 32-33 into Result Value
  Var #1 (Zone 1 heat setpoint) = Result Value
  Put value of received serial characters # 40-41 into Result Value
  Var #2 (Zone 1 cool setpoint) = Result Value
End If
```

Whenever the setpoint message is received, this will put the setpoint values into your own variables. You could even create a custom video screen to display this information.

You only need to do this if you want to track the individual Heat and Cool temperature setpoints separately. Regardless of whether you do this or not, HomeVision will automatically track the current setpoint (which will be either the Cool or Heat setpoint, depending on which setpoint the StatNet is actually using at the time).

- The following StatNet messages are reported back to the HomeVision controller, but not handled automatically. If you want to take action when these are received, you must add an If-Then statement to the HomeVision Serial Data Input Event to detect them. All messages are reported to the HomeVision controller exactly as received from the StatNets.

- HVAC Relay States. Example message: HVAC=G+Y1+W1-Y2-W2-O-B-<CR>

- Remote Temperature. Example message: R=70F<CR>
  - Contact Closure State. Example message: CC=1011<CR>
  - LED Indicator Setting. Example message: L1=OFF<CR>
  - Command Response Control. Example message: CR=S<CR>
- Both the PC software and the HomeVision controller have internal variables to track the thermostat settings. When you send a command to the StatNets (from either the PC or the controller), the variables do not update immediately. Instead, they are updated when the corresponding confirmation is received back from the StatNets. The response normally comes back in a fraction of a second. However, Because of the way the StatNets report "Change of State" event, the message can be delayed up to 9 seconds. For example, if you change the mode from the PC or TV control screen, the screen won't change until the StatNet response is received, which may occasionally be delayed.

A side effect of this occurs when you make a mode change (like from Heat to Cool) that also causes the temperature setpoint to change. The mode change confirmation may come back immediately, but the new temperature setpoint may not show up for several seconds.

- Whenever the PC receives a message from the StatNets, it reports it to the HomeVision controller. It then waits for a controller acknowledgment signal before sending any other messages. If the controller isn't connected and operating, the software will "timeout" and resume operating normally. In this event, the PC software will be delayed when it executes StatNet commands. For example, if you open a schedule that has StatNets enabled, the software will attempt to initialize the StatNets and report their new settings to HomeVision. If HomeVision isn't connected, this process can take many seconds, as each message has to timeout before continuing. If you're developing your schedule while HomeVision is not connected to your PC, we recommend you put the software into the "Demo" mode (from the Preferences screen). This prevents the software from trying to communicate over the serial port, avoiding the timeout problem.
- You may see data like:

```
_pÚ÷000131_
```

on the terminal emulator screen or in your log file (if you're logging data). These are the thermostat commands sent from the controller to the PC. We try to filter these out where possible, but they will occasionally slip through. Just ignore them when you see them.

### **Sending Serial Commands to the StatNets**

If you like, you can have HomeVision send your own serial commands to the StatNets. This is useful for StatNet features that HomeVision does not implement. For example, you can send a command to turn the thermostat LEDs on and off!

To send serial data to the StatNets, you include a serial transmission command in your schedule. The serial transmission should be in this format:

```
To thermostat "DATA TO SEND"
```

The HomeVision PC software will forward the text between the double quotes to the StatNets, and append the necessary carriage return.

For example, to turn the second LED on StatNet number 1 on, send this ASCII text:

To thermostat "SN1 L2=ON"

As another example, you can set the StatNet number 1 Cool Setpoint to 80 degrees and the Heat Setpoint to 70 degrees with by transmitting these two ASCII sequences:

To thermostat "SN1 SC=80"

To thermostat "SN1 SH=70"

Refer to the StatNet documentation for the command formats.

### **PC Thermostat Control Screen**

The StatNets have a comprehensive thermostat control screen in the PC software. Please note the following:

- You can change a mode by clicking the corresponding cell in the table and selecting the new mode from the drop-down list. You must then click the mouse outside of the cell in order to send the command.
- You can change the temperature setpoint by selecting the corresponding value and entering a new number. You must then press the ENTER key or click the mouse outside of the cell in order to send the command.

### **General Notes**

- HomeVision supports up to 16 StatNet thermostats.
- The StatNet mode "Thermostat User Hold" is similar to HomeVision's control mode "Run/Hold". The Enerzone thermostats actually refer to this as the "Day/Night" mode. They correspond as follows:

	<u>MODE</u>	<u>MODE</u>
HomeVision Control Mode:	Run	Hold
StatNet User Hold Mode:	Hold=Off	Hold=On
Thermostat setting:	Day	Night

- The StatNets have different temperature settings for the Cool and Heat modes. Therefore, if you change the mode in your schedule, you may want to follow it with a command to set the desired temperature.
- Under normal operations, the HomeVision controller will always know the current StatNet settings. However, you may want to occasionally request the settings from the StatNet to ensure they're up to date. You will see from the HomeVision owner's manual that there are four commands to do this:
  - Request Thermostat System Mode
  - Request Thermostat Fan Mode
  - Request Thermostat Temperature Setting
  - Request Thermostat Current Temperature

We've implemented these commands in an unexpected way for the StatNets. Each command actually causes HomeVision to request all five of the following StatNet settings:

- Run/Hold (Day/Night) mode
- System mode (Heat, Cool, Auto, Off)
- Fan mode (On, Auto)
- Temperature setpoint
- Current temperature

We did this because of the high speed at which the serial interface works. All five settings can be read and reported back very quickly. Therefore, you only need to use one command to get all the settings. The separate commands are provided for X10 thermostats. Because of the relatively slow speed of X10 and the likelihood of collisions, each setting must be requested separately. The StatNet serial interface doesn't have this problem, making it much easier to use.

- The StatNets have a safety feature that prevents making invalid temperature settings. For example, when you're in the Auto mode, you cannot set the Cool setpoint equal to or lower than the Heat setpoint.
- HomeVision was initially designed to work best with thermostats set in either the Heat or Cool modes. However, many StatNet users will want to use the Auto mode. If you do so, then you shouldn't use HomeVision's built-in thermostat schedule (i.e., HomeVision's ability to automatically change the setpoint up to 8 times per day for different days of the week). The reason for this is that HomeVision's Auto mode schedule only allows you to specify one temperature setpoint at each time, but the StatNets have two setpoints (one for Heat and one for Cool). Therefore, if you use the Auto mode and want to change the temperature setpoint(s) at a certain time, you must use Scheduled Events. Create one scheduled event for each time, and include the desired thermostat commands in them.

### **Unsupported Features**

HomeVision does not use the following StatNet features:

- "Emergency Heat" mode.
- Command Configuration Pattern.
- Individual Heat Set Point and Cool Set Point. Instead, HomeVision always commands the StatNet to change the Current Mode Set Point. This way, any time you command the set point to be changed, the current mode is changed. If you want to change the individual Heat or Cool setpoints, read the "Sending Serial Commands to the StatNets" section.
- Zone naming feature. You may name the zones yourself by sending the appropriate commands to the StatNet. If you name the zones, you must enclose the name in parenthesis. If you don't, the software will not correctly interpret StatNet messages. Here's an example of a valid name:

(Master bedroom)