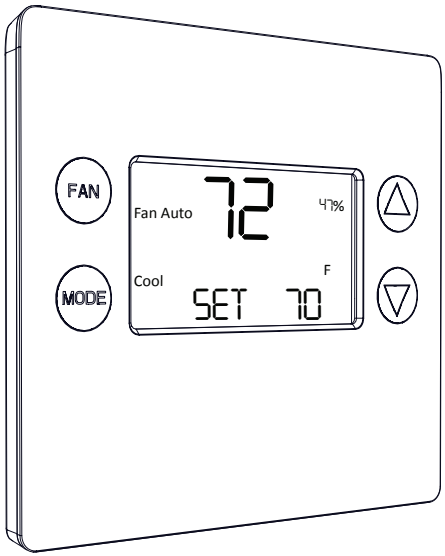
PRINTER'S INSTRUCTIONS: INSTRUCTIONS, USER GUIDE, 2GIG-STZ-1 - P/N: 10028238 Rev-E
INK: BLACK; PANTONE 3005 C - MATERIAL: 60 LB. MEAD BOND - SIZE: 8.500" X 5.500" - TOL. +/- 0.125"- SCALE: 1-1 - FOLDING: ALBUM FOLD: BINDING: SADDLE STITCH

2GIG®

2GIG® Security & Automation System

2GIG Z-Wave Plus™ Battery Powered Thermostat



User Guide

NORTEK™
SECURITY & CONTROL

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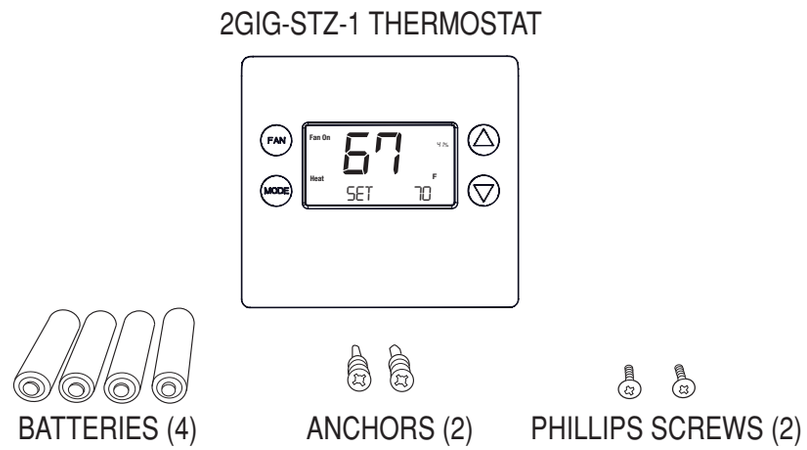
2GIG-STZ-1

BATTERY POWERED THERMOSTAT

INSTALLATION INSTRUCTIONS

The 2GIG-STZ-1 Thermostat is a programmable, Z-Wave communicating thermostat. It can be powered using 24VAC (if both “R”&”C”wires are available at the thermostat) or using four (4) AA batteries. Using Z-Wave technology, you have the ability to use most compatible Z-Wave hubs/controllers to operate the thermostat, configure programming settings as well as displaying current conditions in the home or office.

Figure 1. Z-Wave Thermostat Front View



Features Include

- Heating and cooling setup display options
- System mode (OFF, Heat, Cool, Auto, E-Heat)
- Fan mode control and display (Auto, ON)
- Changeover type for Heat Pump (HP) systems
- On-screen setup of HVAC type, Fan type
- External humidifier / dehumidifier support
- Fahrenheit/Celsius mode and sensor calibration

Box Contents

- 1–Z-Wave Plus Thermostat
- 2–Plastic Wall Anchors
- 4–AA Batteries

Compatible with 24 VAC gas, oil, or electric heating and air conditioning systems; or gas millivolt heating systems

DO NOT USE ON 120VAC SYSTEMS!

Standard Systems

- 1 Stage Heating and Cooling
- 2 Stage Heating and Cooling

Heat Pump Systems

- 1 Stage Heating and Cooling
- 2 Stage Heating and Cooling
- 2nd or 3rd Stage Aux Heating (Electric Heat Strips

Installation Outline

- Step 1 Remove Existing Thermostat
- Step 2 Install 2GIG-STZ-1 Thermostat
- Step 3 Setup Thermostat to match the HVAC System
- Step 4 Install into Z-Wave Network

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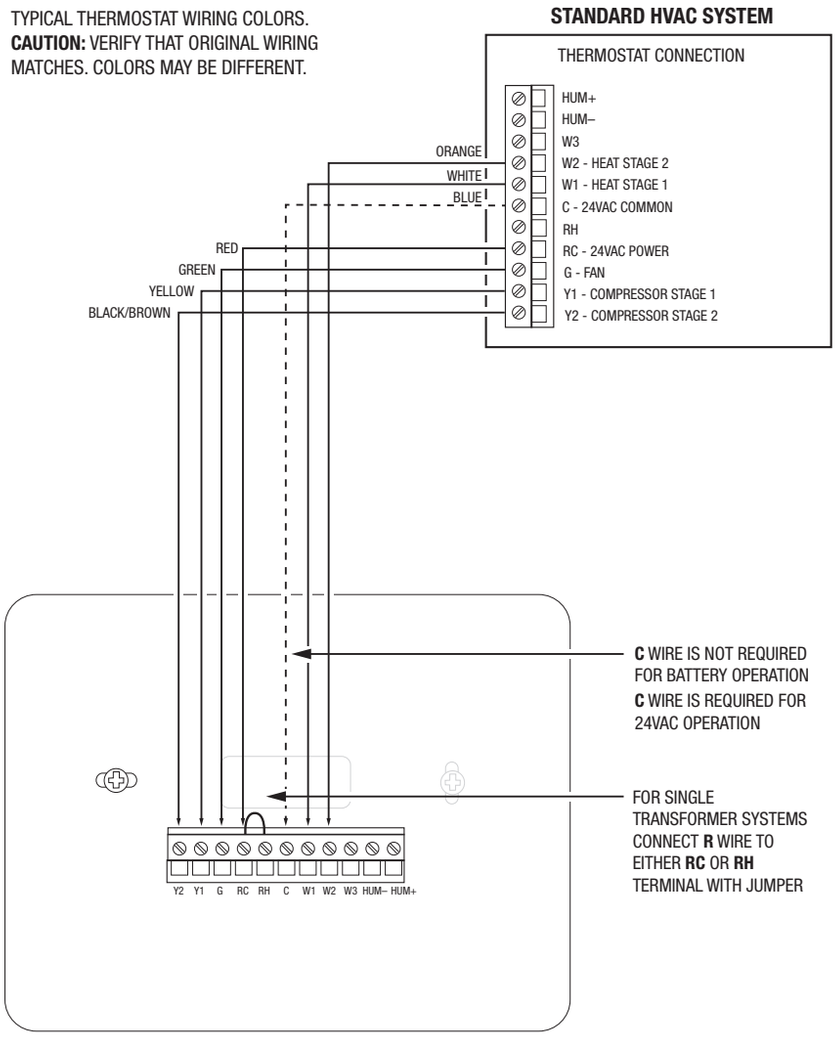
Typical Wiring for Standard Gas/Electric HVAC System

TYPICAL THERMOSTAT WIRING COLORS.
CAUTION: VERIFY THAT ORIGINAL WIRING MATCHES. COLORS MAY BE DIFFERENT.



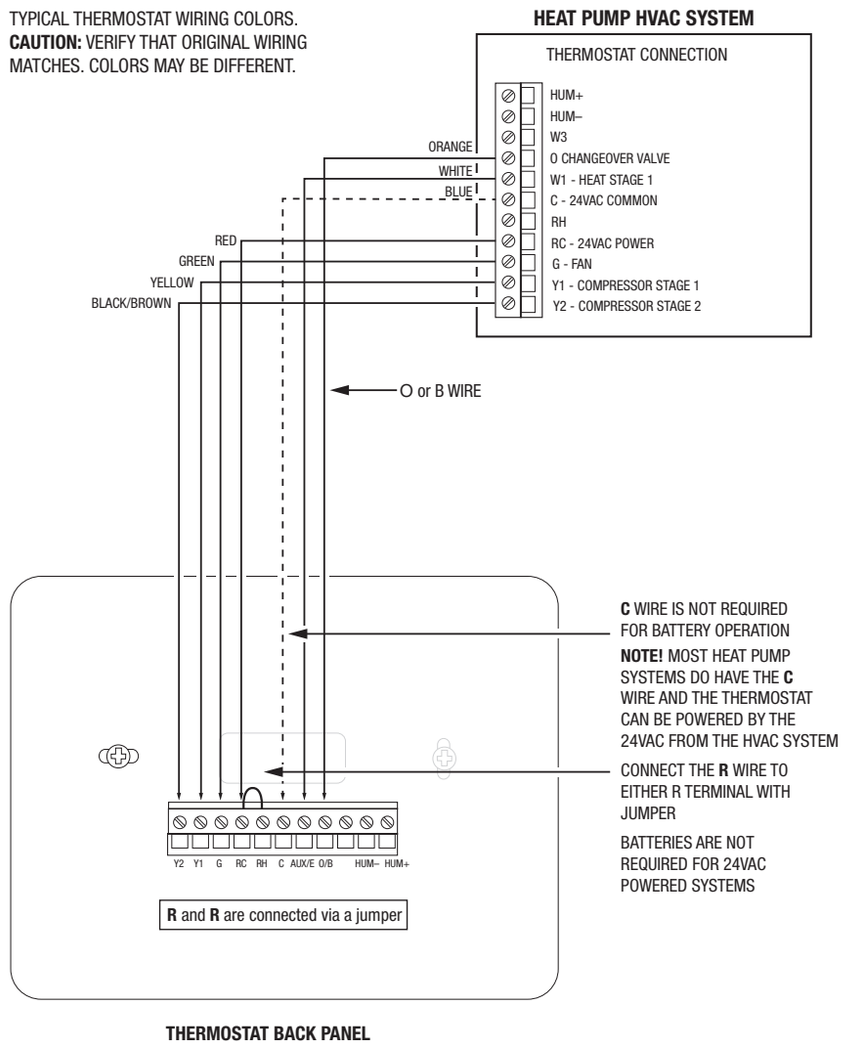
THERMOSTAT BACK PANEL

DEFAULT THERMOSTAT SETUP:
TYPE: STANDARD HVAC
FAN: GAS HEAT
1 STAGE HEATING
1 STAGE COOLING
NO SETUP CHANGE REQUIRED FOR THIS CONFIGURATION

NOTE: FOR SYSTEMS WITH SEPARATE HEATING AND COOLING TRANSFORMERS, PLEASE REMOVE THE JUMPER CONNECTING **RC** AND **RH** TERMINALS FIRST AND THEN CONNECT HEATING **R** TO **RH** AND COOLING **R** TO **RC**. PLEASE SEE PAGE 8.

Typical Wiring for Heat Pump HVAC System

TYPICAL THERMOSTAT WIRING COLORS.
CAUTION: VERIFY THAT ORIGINAL WIRING MATCHES. COLORS MAY BE DIFFERENT.



THERMOSTAT BACK PANEL

NOTE: IF HEATING IS OCCURING WHEN COOOLING IS EXPECTED, OR VICE-VERSA, CHANGE THE CHANGEOVER TYPE TO THE OPPOSITE SETTING.

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Thermostat Power

The thermostat can be powered by either 24VAC from the HVAC system or from four (4) type AA internal batteries. **DO NOT** use this thermostat for line voltage controls (120/240VAC).

The C Wire

If the 24VAC common wire (usually blue) is present and is connected to 24VAC common at the HVAC system end, the thermostat can be powered from the HVAC system. If there is no common wire, batteries are required.

24VAC Power

Powering the thermostat with 24VAC power **requires** both the 24VAC "C" common wire (typically a blue wire) and the 24VAC "R" return wire (typically a red wire).

Battery Power

Powering the thermostat from batteries **does not** require a "C" wire connection.

DO NOT install batteries if the thermostat is powered by 24VAC. They are NOT required for backup.

If the thermostat is powered by batteries, the thermostat will operate for approximately (2) two years on four (4) AA Alkaline batteries depending on the frequency of user operations and backlight operation. Always use Alkaline batteries and replace them in complete sets of four (4).

Z-Wave Operation when Battery-Powered

IMPORTANT: When the thermostat is installed on a Z-Wave network, while it is battery powered, it will NOT work as a Z-Wave repeater.

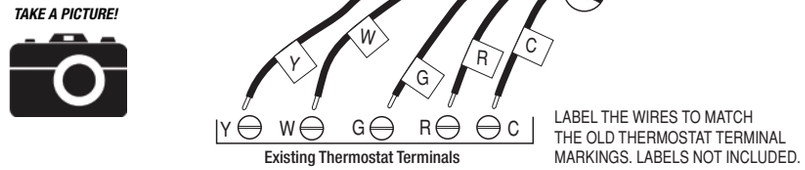
Remove Existing Thermostat

- Turn the thermostat power off. This is usually done at the heating/cooling system or circuit breaker panel.
- Remove the cover of old thermostat to expose the wiring terminals.
- **Take a picture of the wiring terminals and wires before disconnecting them!**
- Mark the existing thermostat wires with the labels (not included) according to the terminal markings. Some installations may have additional wires not shown in the example illustration below (Y1, Y2, W1, W2, O,B).
- Use the thermostat terminal "names/marking" (not the wiring color) to mark the wires.
- Remove the old thermostat base.

CAUTION: When removing thermostat, don't let the wires slip into the wall and don't let the wires touch each other.

- If the old thermostat was a mercury style thermostat, dispose of it properly as described below.

Figure 2. Label Wire Terminals



Note: Taking a picture is critical if problems are encountered. This will allow reinstallation of the old thermostat and help with troubleshooting later if needed.

Terminal	Typical Wire Color	Function
Y	YELLOW	Cool
W	WHITE	Heat
G	GREEN	Fan
R	RED	24VAC Return
C	BLUE	24V Common (typically BLUE). When the wire is present, the thermostat can be powered without batteries. When the wire is absent, the thermostat must be powered by batteries if 24VAC is present across the R&C wires

Wiring Colors

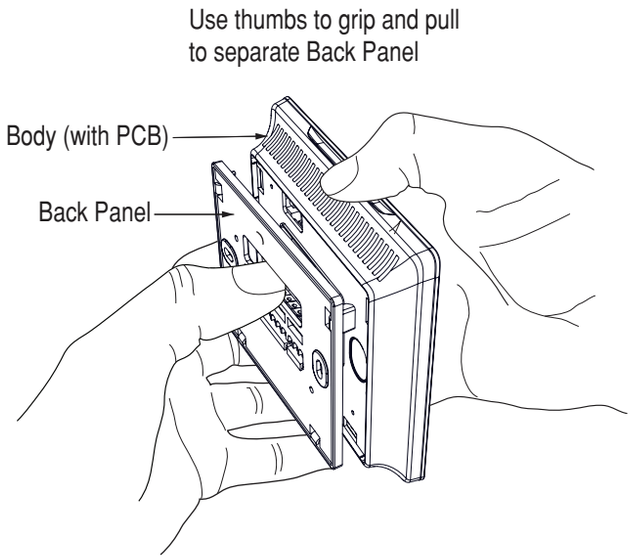
While the thermostat terminal markings are intended to match the wire color (R=RED, G=GREEN, W=WHITE, Y=YELLOW), be sure to follow the terminal marking when marking the wires, even if the wire color doesn't match.

WARNING: If the existing thermostat is a mercury-containing device, it must be disposed of in compliance with federal, state and local regulations. Many states and/or local agencies have collection/exchange programs or hazardous waste collection programs for mercury-containing-devices. For more information, see the U.S. Environmental Protection Agency website at:
https://www.epa.gov/large-scale-residential-demolition/mercury-containing-devices-and-demolition

Install the Back Panel

Remove the back panel of the thermostat by gripping and pulling to separate the Back Panel.

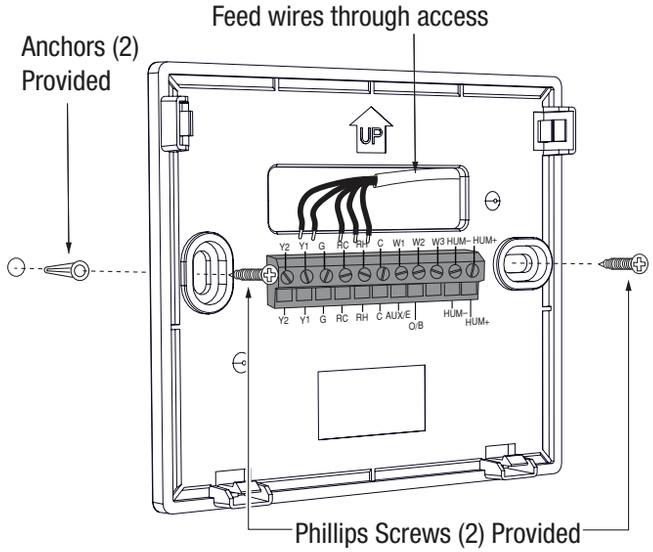
Figure 3. Removing back panel of thermostat



Mount the thermostat back panel on the wall (See Figure 4).

1. Feed the wire cable through the access hole in the mounting plate.
2. Use the two (2) wall anchors and two (2) Phillips screws (provided) to mount the back panel.
3. Level as needed.

Figure 4. Mounting the Back Panel



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Standard HVAC System Connections

Note: For typical connections to a Standard HVAC system, refer to the diagram on page 2.

The upper section shows the **STANDARD HVAC** terminal connections. The lower section shows **HEAT PUMP HVAC** terminal connections.

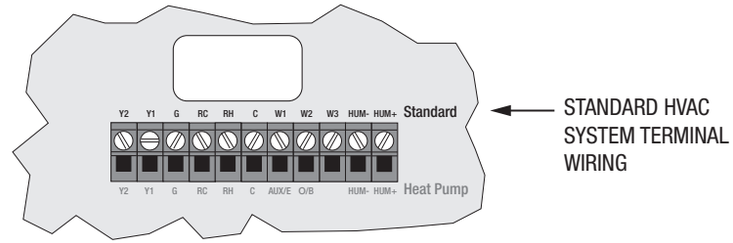

Figure 5. Standard HVAC System Terminal Block Labeling

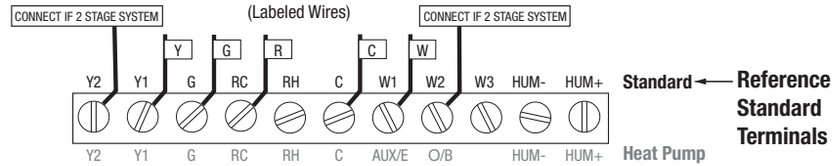

Figure 6. Standard HVAC Systems Terminal Block Connections

Single and Dual Transformer Systems (Split Systems)

HVAC systems may have one or two transformers. The "R" wire connects differently depending on the system.

Single Transformer System

Most HVAC systems have a single 24VAC transformer. For these systems, there is only one "R" wire that can be connected to either the thermostat's RC or RH terminal because a pre-installed **jumper wire** connects the two terminals.

If installing a Standard HVAC system, connect the wires from the HVAC system to the corresponding terminals on the thermostat back terminal block. Use the table below as a guideline for connecting the wires.

Wire	Terminal
Y	Connect to the Y1 terminal
G	Connect to the G terminal
R	Connect to either RC or RH terminals (Except for Dual Transformer Systems. See next page.)
C	Connect to the C terminal. C wire (24VAC common) may not be present. If not present, batteries MUST be installed.
W	Connect to the W1 terminal

Notes:
- Ensure that the appropriate wires are screwed into the terminal blocks firmly.
- Gently pull on the wires to confirm the connection.
- Push all excess wiring back into the wall opening.

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Dual Transformer Systems

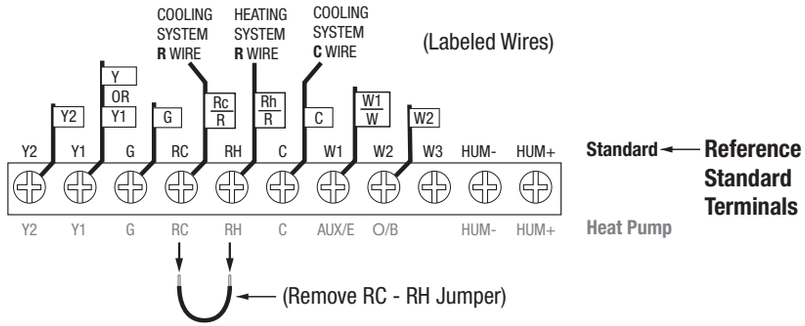
For HVAC systems that have separate heating and cooling systems with their own 24VAC transformers, there is an “R” wire from the heating system and an “R” wire from the cooling system.

For dual transformer systems, connect the “C” wire from the **cooling** system to the thermostat’s “C” terminal. **DO NOT CONNECT THE “C” WIRE FROM THE HEATING SYSTEM.**

IMPORTANT: Remove the Jumper connecting RC and RH terminals (see illustration below).

Figure 7. Dual Transformer HVAC System Thermostat Terminal Connections

Connect the wires from the HVAC system to the corresponding terminals on the thermostat back terminal block. Use the table below as a guideline for connecting the wires.



Wire	Terminal
Y2	Connect to the Y2 terminal **(2-stage systems only)**
Y or Y1	Connect to the Y1 terminal
G	Connect to the G terminal
COOL RC	Connect to RC terminal
C	Connect to C terminal (Cooling System C Wire, **NOT** Heating System C Wire)
HEAT RH	Connect to RH terminal
W or W1	Connect to W1 terminal
W2	Connect to W2 terminal **(2-stage system only)**

Heat Pump HVAC System Connections

Note: For typical connections to a Heat Pump HVAC system, refer to the diagram on page 3.

The lower section shows **HEAT PUMP HVAC** terminal connections. The upper section shows the **STANDARD HVAC** terminal connections.

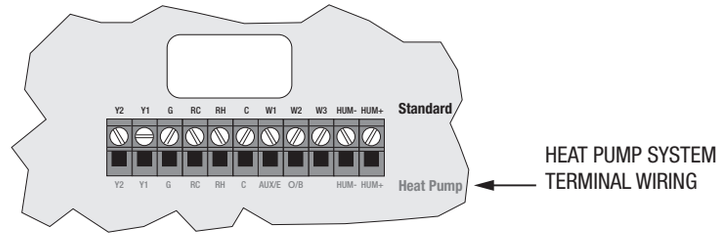


Figure 9. Heat Pump HVAC System Terminal Block Labeling

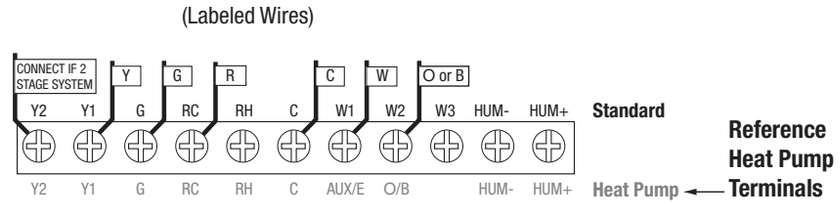


Figure 10. Heat Pump HVAC System Thermostat Terminal Block Connections

Connect the wires from the HVAC system to the corresponding terminals on the thermostat back terminal block. Use the table below as a guideline for connecting the wires.

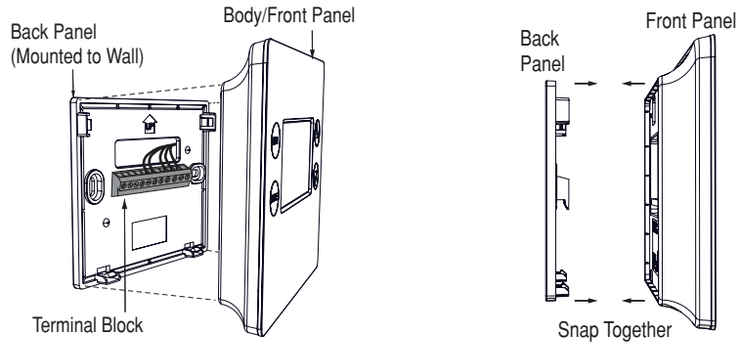
Wire	Terminal
Y1	Connect to the Y1 terminal
Y2	Connect if a 2 stage system
G	Connect to the G terminal
RC	Connect to either R terminal
C	Connect to the C terminal. The C wire (24VAC common) Heat Pump systems typically have the C wire connected to the thermostat. If there is no **C** wire, batteries MUST be installed.
W1	Connect to the W1 terminal
O/B	Connect to the O terminal. Heat Pump setup must set changeover valve to correct **O** or **B** setting (See page 13).

Notes: Ensure that the appropriate wires are screwed into the terminal blocks firmly.
Gently pull on the wires to confirm the connection.
Push all excess wiring back into the wall opening.

Mount the Thermostat

Install the thermostat body/front panel onto the wall mounted base by firmly pressing in place until it snaps all around the edges. The thermostat is now ready to program.

Figure 11. Attaching Front Panel to Back Panel



Battery Installation

If installing batteries, open the thermostat battery front panel. Separate the cover using fingernails at the indents on the top of the case (See Figure 12). Install the four (4) type AA batteries and assemble as shown in Fig.13.

Figure 12. Opening Battery Case/Cover

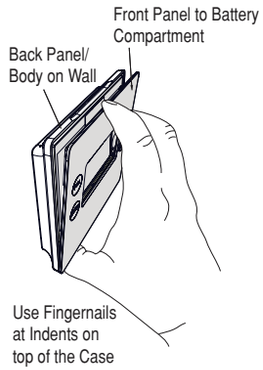
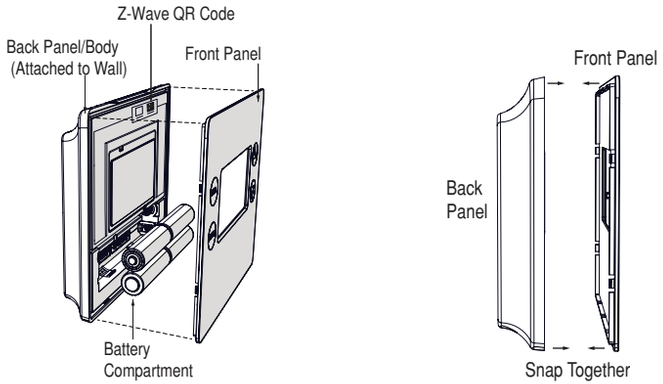


Figure 13. Battery Installation



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Thermostat Setup Menus

The thermostat must be set up for the correct HVAC system type for proper operation.

Preset HVAC System settings

The thermostat is preset for the following typical HVAC system configuration:

- *HVAC system type:* Standard gas/electric
- *HVAC fan type:* Gas heat
- *HVAC heating stages:* One
- *HVAC cooling stages:* One

If the thermostat is installed on this type HVAC system, the System Setup does not need to be changed.

If installed on a Heat Pump HVAC system or any HVAC configuration other than the preset settings, change the settings in the SYSTEM setup menu to match the HVAC system.

Note: To conserve energy, the thermostat backlight turns off after a short time of no activity. The first button touch turns on the backlight (but does not initiate any action). Touch the button again to initiate the action desired. If the backlight is already on, button touches work with the first touch.

Wait Mode

The thermostat has a *Minimum Off Time* (MOT) delay after any heating or cooling cycle ends. This delay prevents rapid heating/cooling cycles and also provides “short cycle protection” for the system compressor. This delay may be noticeable when you change a setpoint, and it does not respond immediately due to the MOT delay timer preventing the system from restarting. The MOT delay time can be adjusted in the Advanced Settings menu of the thermostat, but there is a minimum of five minutes delay to assure compressor protection.

Minimum Run Time (MRT)

The thermostat has a *Minimum Run Time* delay after the start of any heating or cooling call. This minimum run time assures even heating and cooling cycles. The MRT will keep the system on, even if it reaches the setpoint room temperature or if you change the setpoint to a temperature that would satisfy the call until the MRT expires. The MRT can be adjusted in the Advanced Settings menu of the thermostat.

Note: The MRT delays are shown by flashing heat or cool icons on the display.

Frost Protection

The thermostat has a frost protection feature built in. It forces the highest possible heat stage to turn on in order to prevent room temperature from becoming too cold. Once enabled, frost protection activates automatically at 41°F (5 °C) and deactivates at 48 °F (8 °C), regardless of System Mode and Heat/Cool Set Point. To activate the feature, go to Advanced Systems Settings Menu (p17).

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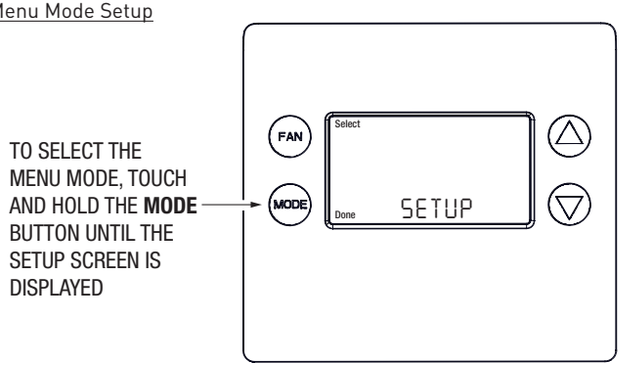
Entering Menu Mode

To change the System setup, you'll need to go to the thermostat's Menu Mode and select **SYSTEM**.

Touch and hold the **MODE** button to enter the Menu Mode. **SETUP** is the first menu item displayed. Touch the ▼ button to advance to the **SYSTEM** screen. From there select the correct HVAC settings to match the installation type.

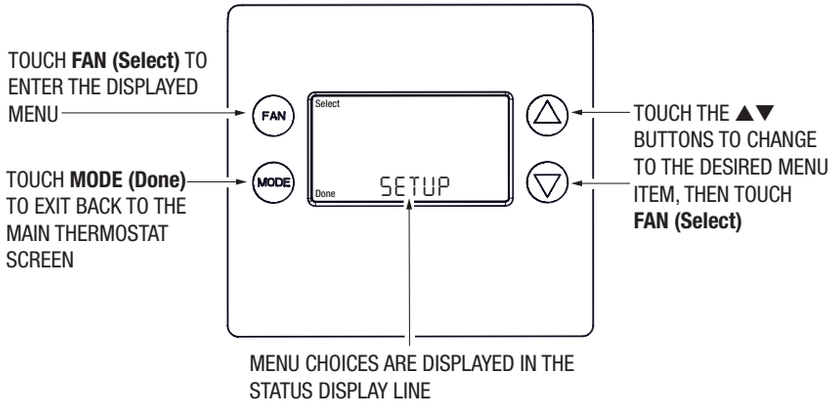
Figure 14. Menu Mode Setup



Menu Mode Navigation

When the thermostat Menu Mode screen is displayed, touch the ▲▼ buttons to scroll through the following menu items.

Figure 15. Menu Navigation



The following menu items are displayed in order (pressing ▼ to cycle options).

- SETUP (user preference settings)
- SYSTEM (HVAC system setup)
- HUMI (humidification support if applicable)
- Z-WAVE (install/uninstall from Z-Wave network)
- CLOCK (set time and day)
- INFO (firmware versions and Z-Wave network information)
- For multi-stage HVAC System Setup, please go to Advanced System Settings Menu (page 17)

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Touch and hold MODE to access the menu options. To select options:

- Use the ▲▼ buttons to scroll to the desired setting.
- Touch **FAN (Select)** to choose the option. The selected option will flash.
- Change the option with the ▲▼ buttons.
- When the desired option has been selected, touch **FAN (Select)** again to save it.
- Then touch **MODE (Done)** to exit.

Setup Menu

The SETUP menu is used to set the user preferences (see page 23).

- *Farenheight* or *Celsius*: F* or C
- *Backlight Timeout*: 20* seconds
- *Sensor Calibration*: Sensor sensitivity (-13°F to +13°F; default is 0)
- *Status Line* (display): Setpoint* or Clock

System Menu

The **SYSTEM** menu is used to setup the thermostat for the correct HVAC system type. The following setup options will be displayed in the text line:

- *System Type*: Standard* or Heat Pump. For Standard Gas/Electric systems, select **STANDARD**.
- *Fan Type* (for Standard HVAC systems only): Gas* or Electric

Changeover Type (available with *Heat Pump* setup)

The changeover (or reversing) valve is used to change from heating to cooling operation. The HVAC system is either a Changeover with Cooling type (O) or Changeover with Heating type (B). Most are changeover with cooling, which is the default setting.

- For Changeover with Cooling systems, select **WITH COOL**. This is the default setting.
- For Changeover with Heating systems, use the ▲▼ buttons to change to **WITH HEAT**.
- Touch **FAN (Select)** to set.
- Touch **MODE (Done)** to exit.

Not sure which type Changeover system? Check the existing thermostat connections to help determine this. If the original system had an orange wire connected to an “O” terminal, then you have a “changeover with cool” system. If there was a brown wire connected to a “B” terminal, then you have a “change over with heat” system. Set the Changeover setting accordingly.

Note: If heating turns ON when cooling is expected or vice versa, switch the “Changeover Type” to the opposite setting.

HUMI

The SETUP menu is used to set the humidification type, if used. The following setup options will be displayed in the text line:

- *(Mode) Disable**, Humidify or Dehumidify*
- *Moist Setpoint:* 30%** to 70% *(Humidify)*
- *Dry Setpoint:* 30%** to 70% *(Dehumidify)*
- *Cooling Setpoint shift**:* 0°F to 18°F

**Alternatively, you can dehumidify by over-cooling when System Mode is set to Cool. Ensure HUMI is set to *Disable*. Navigate to Cooling Setpoint Shift, and enter the amount of degrees (0°F to 18°F) to shift down from the cooling setpoint. (default: 0°F)

Z-WAVE

See **Z-WAVE Plus Installation**, next page.

CLOCK

Set the *Day* and *Time*. See page 15.

INFO

Model, Version, Z-Wave, Battery (%). See page 16 for descriptions.

* Default Setting

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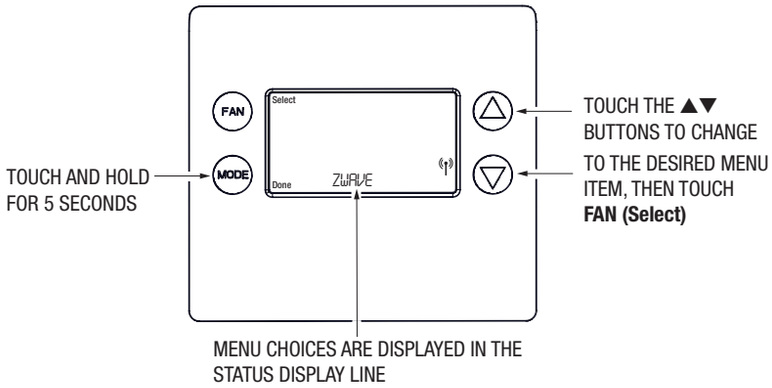
Z-Wave Setup

This section details steps to include the thermostat into Z-Wave network after installation and initial setup have been completed.

Note: Before adding the thermostat to a Z-Wave Network, check to make sure it does not already belong to one by viewing the Node ID (ZNID) located in the thermostat INFO screen. An installed thermostat would show a Node ID number. Consult your controller's user manual for details on removing a device from a Z-Wave network.

Figure 16. Z-Wave Menu Setup



General Programming Procedure (for controllers supporting the thermostat device class):

Note: This thermostat supports S0, S2 unauthorized and S2 authorized Inclusion Modes. If you use the S2 authorized Inclusion Mode, you will need S2 QR code or pin code, which is printed under the faceplate above the LCD screen. To access the QR code, you'll need to remove the faceplate.

1. Set your primary controller to Include, add or Install mode, to add the thermostat as a node on your network (see your controller's user manual for detailed instructions).
2. Touch any button to take the thermostat out of sleep mode.
3. Touch and hold **MODE** button for 5 seconds. **SETUP** will be displayed in the status display line.
4. Scroll to "Z-Wave" using ▲▼ buttons. Touch **FAN (Select)**.
5. When prompted by your Z-Wave controller, select **YES** in the Z-Wave Install screen.
6. Touch **FAN (Select)** to add thermostat to network.
7. The display line should flash **WAIT** and then **SUCCESS** if Z-Wave connection is made.
8. If Z-Wave does not connect to controller, **WAIT**, then **FAIL** will flash in status display line.
9. If thermostat fails to connect, repeat Steps three (3) through (7) to re-try connecting.

Your controller will indicate the thermostat was successfully added to its network (see your controller's user manual for details). Also, you can check if the thermostat was successfully added to the network by checking the ZHID (Home ID) and ZNID (Node ID) located in the thermostat INFO screen.

For other specific tasks, such as adding the thermostat to Scenes or Groups or deleting the thermostat from an existing network, refer to the Z-Wave controller instructions.

Removing from a Z-Wave Network

To remove the thermostat from the network, use the following steps.

1. Set your primary controller to exclude or remove mode to remove the thermostat as a node on your network (see your controller's user manual for detailed instructions).
2. Touch any button to take the thermostat out of sleep mode.
3. Touch and hold the **MODE** button for 5 seconds. **SETUP** will be displayed in the status display line.
5. Scroll to "Z-Wave" using ▲▼ buttons. Touch **FAN (Select)**.
6. When prompted by your Z-Wave controller, select **YES** in the Z-Wave exclude screen.
7. Touch **FAN (Select)** to remove thermostat to network.
8. The display line should flash **WAIT** then **SUCCESS** if the thermostat is removed from the network.
9. If the removal operation is not successful, **WAIT** will flash, then **FAIL** will flash in status display line. Repeat Steps three (3) through (7) to re-try.

SmartStart

This Thermostat is *SmartStart* enabled and can be pre-included into to a Z-Wave network by using a *SmartStart* controller to scan the Z-Wave QR Code shown on the thermostat. No further action is required and the *SmartStart* thermostat is added automatically within ten minutes after powering on in the vicinity of the network.

To add 2GIG-ST1 to the Z-Wave network using *SmartStart*:

1. Set the Z-Wave controller in Security S2 Authenticated "Add Mode"
2. Key in the thermostat DSK to the controller.
3. Power on the device.
4. Wait for the inclusion process to complete.

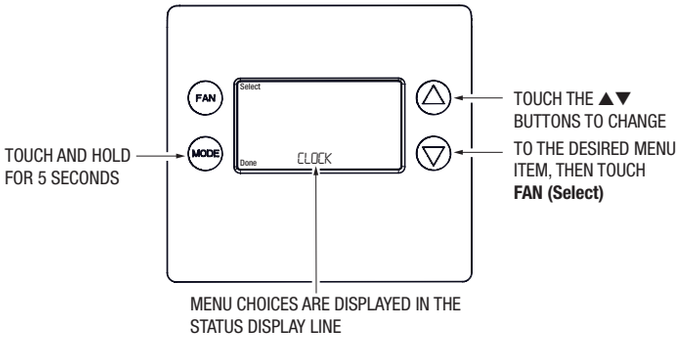
Note: The S2 DSK string, pin code, and QR code are printed on a label above the LCD screen under the faceplate.

Note: If power to the thermostat is removed and reapplied, please allow at least 15 minutes before the power is reapplied to the thermostat to ensure successful SmartStart inclusion process.

Clock Menu

Use the clock menu to set thermostat's internal clock.

Figure 17. Clock Setup



Setting the Clock

1. Touch any button to take thermostat out of sleep mode.
2. Touch **MODE** button for 5 seconds until, **SETUP** appears in status display line.
3. Use ▲▼ buttons to select **CLOCK** in status display line.
4. Touch **FAN (Select). DAY** will be displayed
5. Touch the ▲▼ buttons. **TIME** will be displayed.
6. Use the ▲▼ buttons to select the current time.
7. Choose **FAN (Select)**, **MODE (Done)**, **MODE (Done)**.

INFO Menu

The INFO menu displays information about the thermostat. Use the ▲▼ buttons to scroll through the various items.

- MODEL 2GIG-STZ-1
- VERSION Thermostat firmware version.
- Z-WAVE Z-Wave firmware version.
- SYSTEM TYPE displays current System Type setting.
- If System Type = Standard, FAN TYPE displays current Fan Type setting.
- If System Type = Heat Pump, CHANGEOVER TYPE displays current Change Over setting.
- Battery xx% = Battery Level (If battery powered)

If the thermostat is included in a Z-Wave network, items below will be present.

- Z-Wave Node ID Node ID of Z-Wave Network
- Z-Wave Home ID Home ID of Z-Wave Network

Factory Reset

WARNING: Please use this procedure only when the Z-Wave Primary Controller is missing or otherwise inoperable.

To reset the 2GIG-STZ-1's Z-Wave parameters to Factory Settings (both Z-Wave and HVAC settings):

8. Touch and hold **MODE** button to go to Setup menu.
9. Touch and hold **MODE** and the down arrow key (▼) to enter Advanced Menu.
10. Navigate to *Restore Defaults* to perform a factory reset.

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Advanced System Settings Menu

The Advanced System Settings Menu provides for addition system setup options. These settings can affect system operation and should only be changed by qualified HVAC installers.

To access the Advanced System Settings menu, first touch and hold the **MODE** button to get into the Setup menu. While in the Setup Menu, touch and hold both the **MODE** and ▼ buttons for 5 seconds.

- Use the ▲▼ buttons to scroll through the menu options to the desired setting.
- Touch **FAN (Select)** to change a setting. Once it begins to flash, use the ▲▼ buttons to select the desired setting.
- Touch **FAN (Select)** to accept the new setting (flashing will stop). Select **MODE (Done)** to exit the option and return to the SETUP screen.

Feature	Description	Range
Test Mode	Temporary shorten Minimum Run Time, Minimum Off Time to 10 seconds for fast testing.	Y or N
Frost Protection Enable	When enabled, frost protection activates at 41 °F (5 °C) and stops at 47 °F (8 °C) regardless of System Mode and Heat / Cool Set Point.	Y or N
Aux Heat Enable (Heat Pump System Only)	Use Auxiliary Heater as 2nd / 3rd Stage Heater.	Y or N
2nd Stage Heat Enable	Enables the second stage heat operation	Y or N
3rd Stage Heat Enable (Standard System Only)	Enables the third stage heat operation	Y or N
2nd Stage Cool Enable	Enables the second stage cool operation	Y or N
Compressor in Heat Stage 3 (Heat Pump System Only)	Set **No** to disable compressor in Heat Stage 3 for energy saving.	Y or N
Minimum Run Time	Minimum Run Time before a heating / cooling cycle can turn off.	1 – 9 minutes
Minimum Off Time	Minimum Off Time before a heating / cooling cycle can begin.	5 – 9 minute
Heat Set point Max	Maximum Set point value of Heat Mode	32 – 90 °F (0 – 32 °C)
Cool Set point Max	Maximum Set point value of Cool Mode	61 – 122 °F (16 – 50 °C)
Heat Blower Off Delay	System blower delay off time after a heat call ends	0 – 90 seconds
Cool Blower Off Delay	System blower delay off time after a cool call ends	0 – 90 seconds
Heat-Cool Delta	Minimum separation between Heating and Cooling Set point	36-48°F (2 – 9 °C)
Heat Stage 1 on Threshold	Delta from Set point that stage 1 heating start	34 - 45°F (1 - 7°C)
Heat Stage 1 off Threshold	Delta from Set point that stage 1 heating off	32 - 45°F (0 – 7 °C)
Heat Stage 2 on Threshold	Delta from Set point that stage 2 heating start (This will be Aux Stage on Threshold, if Aux Heat Enable & 2nd Stage Heat not Enable in Heat Pump System)	36 - 46°F (2 – 8 °C)

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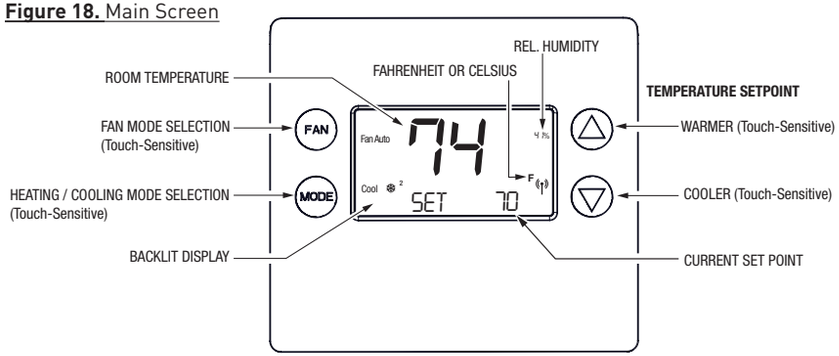
Advanced System Settings Menu
(Continued)

Feature	Description	Range
Heat Stage 2 off Threshold	Delta from Set point that stage 2 heating off (This will be Aux Stage off Threshold, if Aux Heat Enable & 2nd Stage Heat not Enable in Heat Pump System).	32 - 46°F (0 – 8 °C)
Heat Stage 3 on Threshold	Delta from Set point that stage 3 heating start (This will be Aux Stage on Threshold, if 2nd Stage Heat Enable + Aux Heat Enable in Heat Pump System)	37 - 48°F (3 – 9 °C)
Heat Stage 3 off Threshold	Delta from Set point that stage 3 heating off (This will be Aux Stage off Threshold, if 2nd Stage Heat Enable + Aux Heat Enable in Heat Pump System)	32 - 48°F (0 – 9 °C)
Cool Stage 1 on Threshold	Delta from Set point that stage 1 cooling start	34 - 45°F (1 – 7 °C)
Cool Stage 1 off Threshold	Delta from Set point that stage 1 cooling off	32 - 45°F (0 – 7 °C)
Cool Stage 2 on Threshold	Delta from Set point that stage 2 cooling start	36 - 46°F (2 – 8 °C)
Cool Stage 2 off Threshold	Delta from Set point that stage 2 cooling off	32 - 46°F (0 – 8 °C)
Restore Defaults	Restore all setting to defaults	Yes / No

Thermostat Operation

Main Thermostat Screen

Figure 18. Main Screen

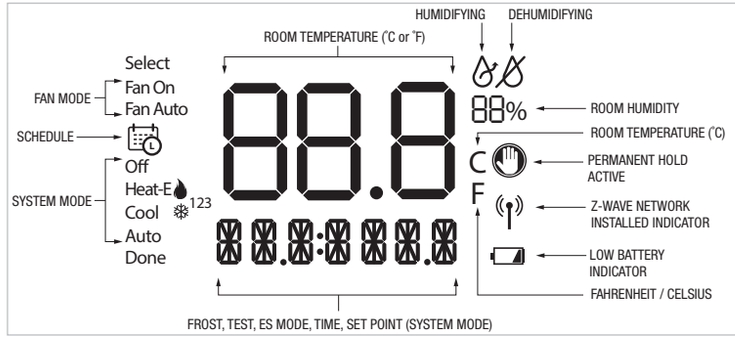


Backlight and Button Operation

To conserve battery power, the thermostat backlight is normally set turn off after 20 seconds without touching. If the backlight is off, the first button touch of any button will only turn on the backlight. Once the backlight is on, the buttons function normally.

Display

Figure 19. Display Screen System Operation Model



	displayed > System is ON and heating
	blinking > System is ON and heating. Minimum Run Time (MRT) delay is active
	displayed > System is ON and cooling
	blinking > System is ON and cooling. Minimum Run Time (MRT) delay is active

Note: Degrees C (Celsius) are shown in .5 degree increments. Degrees F (Fahrenheit) are shown in 1 degree increments

Staging Indicators

"1" = Stage 1 heating or cooling is ON

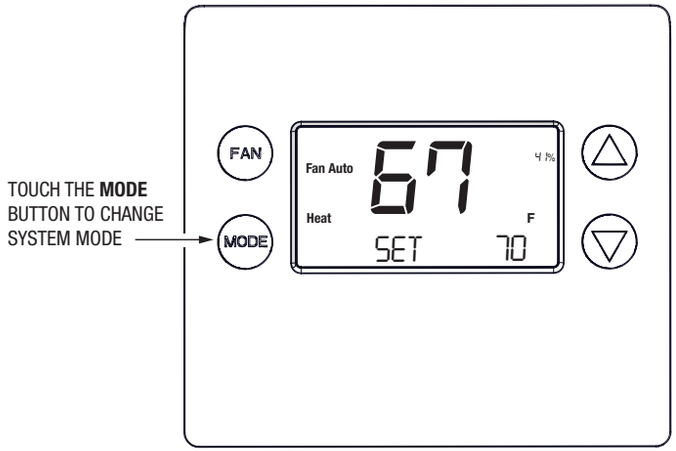
"2" = Stage 2 heating or cooling is ON

"3" = Stage 3 heating (Aux Heat) is ON

For Heat Pump systems only: "Heat-E" = Emergency heat mode active

Setting the System Mode

Figure 20. Setting the System Mode



System Modes

- **Off*:** System is off. No heating or cooling will come on. If system was on, it will turn off immediately.
- **Heat:** Only heating will occur.
- **Cool:** Only cooling will occur.
- **Auto:** Heating or cooling will activate according to the heating and cooling setpoints. The system will automatically switch between heating and cooling modes as needed to maintain the setpoints.

* = Default

Special Heat Pump Mode: Emergency Heat

An additional system mode, "Heat-E" for Emergency Heat will be displayed if the HVAC System Type is set to *Heat Pump*. If there is a compressor failure with the Heat Pump system, setting the mode to *Emergency Heat* will allow the supplemental Aux Heat to activate first whenever there is a call for heating. It also disables the compressor output to prevent further damage to the HVAC system.

CAUTION! ***Emergency Heat*** **should only be used for emergencies until the HVAC system can be repaired. Running the system in** ***Emergency Heat*** **mode is commonly the most expensive mode since only the electric heat strips are being used instead of the more efficient heat pump compressor.**

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Setting the Heating or Cooling Temperature Setpoint

To change the setpoint, touch the ▲▼ buttons. The screen will switch to the setpoint change screen, and show the current setpoint of the current heating or cooling mode. Adjust the setpoint temperature up or down with the ▲▼ buttons.

Note: When in the Setpoint Change screen, pressing the **MODE** button will switch the setpoint being displayed between the *Heating** and *Cooling* setpoints.

* = Default

Figure 21. Accessing Setpoints

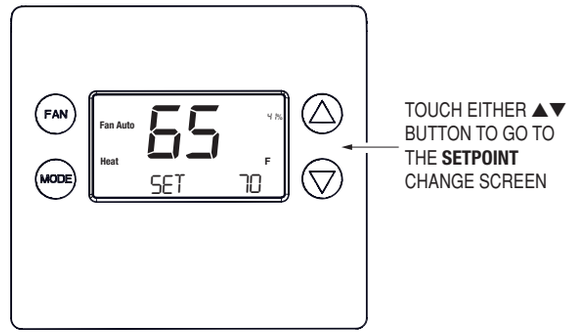
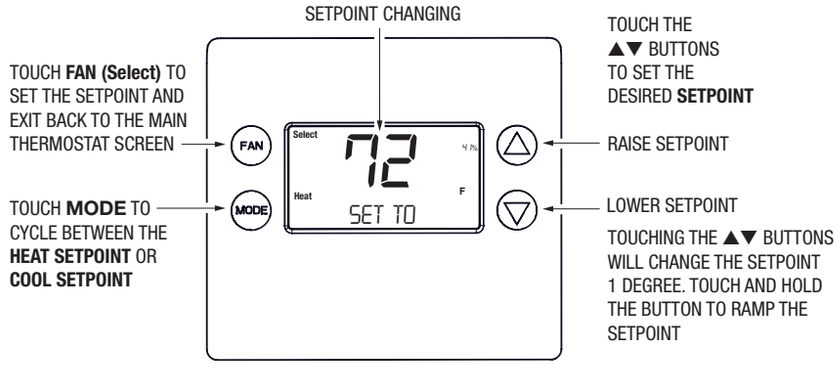


Figure 22. Setpoint Change Screen



Automatic Setpoint Push

The cooling setpoint cannot be set below the heating setpoint. The thermostat will "push" the heating setpoint lower if the cooling setpoint is set below the current heating setpoint. A three (3) degree separation is maintained between the heating and cooling setpoints. The same is true for raising the heating setpoint above the cooling setpoint. The thermostat will "push" the cooling setpoint up to maintain the 3 degree separation.

Frost Protection

Frost Protection is used to prevent rooms from being too cold. Once enabled, frost protection activates at 41 °F (5 °C) and stops at 47 °F (8 °C) regardless of System Mode and Heat / Cool Set Point. To activate the feature, go to Advanced Systems Settings Menu (p17).

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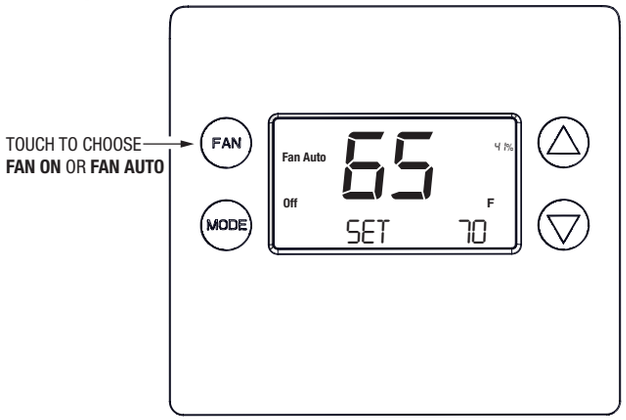
Setting the Fan Mode

Figure 23. Fan Setting



Fan Modes

Use the **FAN** button to cycle the HVAC system's fan modes.

- **Auto:** Fan automatically operated by the HVAC system (normal setting).
- **On:** Manual Fan mode. Fan stays on until mode is changed back to *Auto*, independent of the heating or cooling system operation.

Note: *Fan Off* mode is not supported by the thermostat. The off command from Z-Wave controller/ gateway will be ignored.

User Customization

Figure 24. Selecting Menu Mode

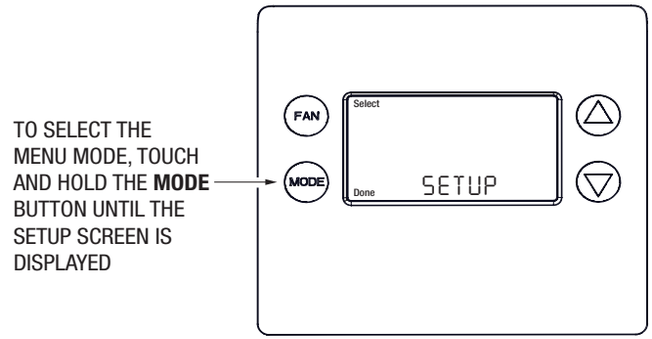
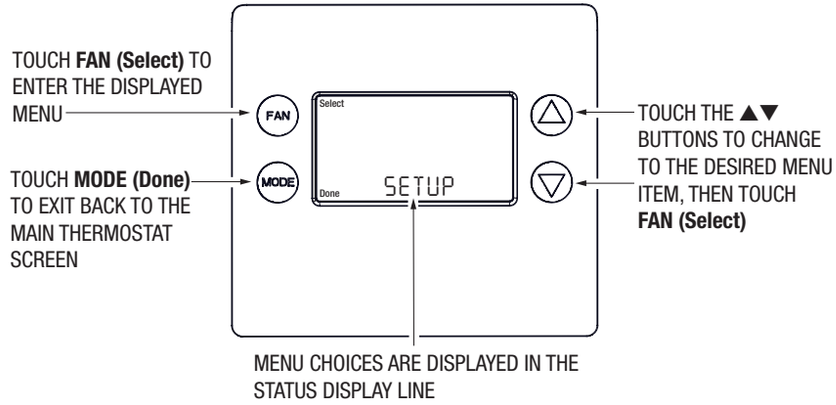


Figure 25. Menu Navigation



User preference settings.

- FAHRENHEIT* OR CELSIUS. Select the temperature display mode.
- BACKLIGHT TIMEOUT. Sets the time from last button touch that the backlight will turn OFF. Range: 10-30 seconds. Default is 20* seconds.

Note: Long backlight timeouts will reduce battery life.

- SENSOR CALIBRATION Change the temperature calibration by +/- 7 degrees. Default is 0*. Touch the UP or DOWN arrow buttons to change to the desired display temperature.
- STATUS LINE. Sets Status Line to Setpoints* or Clock information.

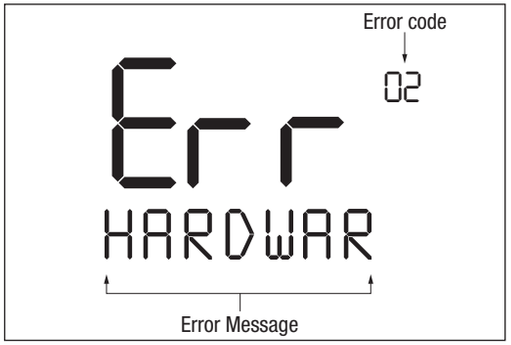
* = Default

Error Display

If any error occurs (hardware, software, Z-Wave, improper use), the thermostat would display the Error Screen. While in Error Screen, no operation can be performed and all relays will be turn off.

After the issue has been resolved, the thermostat will return to Main Screen.

Figure 26. Error Screen



Error Code	Meaning
1	Climate Detector Fail
2	Storage Fail
3	Touch Button Fail
4	Both Battery and AC Power are applied to device
5	Firmware Corrupted

AC and Battery Both Applied

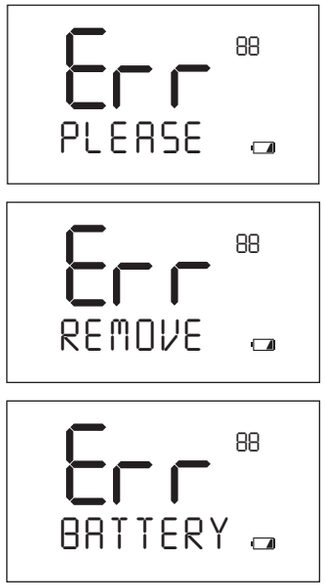
The thermostat will display **Error Screen** when both AC power and Battery are applied.

"**PLEASE REMOVE BATTERY**" will scroll over the Display Text Line. The *Low Battery Indicator* will be displayed.

The thermostat will return to the **Main Screen** once either battery have been removed.

See Battery Installation, page 10.

Figure 27. Battery Error Display



Specifications

Type	**Programmable thermostat for:** 24VAC 3H/2C non-heat pump or 24VAC 3H/2C heat pump systems with humidifier/de-humidifier support.
Room Temperature Measurement	**Temp. Scale:** Fahrenheit / Celsius (user selectable) **Temp. Range:** 32 ~ 122°F (0 ~ 50°C) (Operating Temperature Limit) **Temp. Accuracy:** +/- 1°F (0.5°C)
Temperature Setpoint Range	**Heat Set Point:** 32 – 90 °F (0 – 32 °C) **Cool Set Point:** 61 – 122 °F (16 – 50 °C) **Setting resolution:** 1°F (0.5°C)
Fan Control	Auto/On
Output Relays	Latching type relay for all switching. Seven Relays (C, RC, RH, W1, W2/O, Y1, Y2, G, W3, HUM+, HUM-)
Control Logic	**Compressor short cycle protection:** 5 - 9 minutes, user configurable **Minimum Run Time:** 3 minutes (gas/electric heating), 4 minutes (compressor operation)
Program	OFF, Heat, Cool, Auto, E-Heat
Power Supply	**AC: 18-26VAC 60Hz (R and C)** 4x AA size battery (6VDC)
Operating temperature	32 ~ 122°F (0 ~ 50°C)
Operating humidity	10 ~ 90%RH
Certification	FCC Part 15, Industry Canada, Z-Wave

Z-Wave Information

- This thermostat can be operated in any Z-Wave network with other Z-Wave certified devices from other manufacturers. All non-battery operated devices within the network will act as repeaters regardless of vendor to increase reliability of the network.
- Z-Wave is an Inter-operable two-way RF mesh networking technology designed for use with a Z-Wave gateway/controller and other Z-Wave enabled devices.

Advanced Z-Wave® Information

This section is for the advanced user who has knowledge of the Z-Wave™ Command Classes. Please note that the thermostat operates in Frequently Listening Receiver Slave (FLiR) mode, when it is battery-powered.

Support for Association Groups

This thermostat supports Group 1, which can hold up to 5 nodes.

Group 1 Association is the default status report channel in Z-Wave Plus lifeline requirements. Group 1 Alerts notify an associated device of a thermostat generated change. Thermostat generated changes are changes that originate at or by the thermostat.

The following information is included in the lifeline report:

- THERMOSTAT MODE V3
- THERMOSTAT SETPOINT V3
- SENSOR MULTILEVEL V6
- CLOCK
- HUMIDITY CONTROL MODE
- HUMIDITY CONTROL SETPOINT
- THERMOSTAT FAN STATE
- THERMOSTAT FAN MODE V3
- HUMIDITY CONTROL OPERATING STATE
- THERMOSTAT OPERATING STATE V2
- BATTERY
- DEVICE RESET LOCALLY

Low Voltage Alarm

When battery power is down to 30% or lower, the thermostat will send a low voltage alarm to the Z-Wave Controller and display the low battery icon on the LCD.

Z-Wave Indicator

The thermostat's Z-Wave indicator will display when it receives Indicator CC from ZWave controller/gateway.

Basic CC and Thermostat Mode CC

Basic Set On/Off is mapped to Thermostat Mode CC. Z-Wave controller/gateway sends a Basic Set CC with value 0 (Off) to set Off mode, and sends value 255 (On) to set Auto mode.

Energy Saving Mode

Energy Saving Mode is only available for those with a compatible Z-Wave controller/gateway that supports energy saving mode.

The thermostat can be put into energy saving mode through ZWave by setting Thermostat Mode to Energy Save Heat (0x0B), Energy Save Cool (0x0C), Away Heat (0x0D) or Away Cool(0x0E), from the controller/gateway app.

When in Energy Saving Mode, the thermostat will display "ES Mode", and manage the climate according Energy Heat/Cool Setpoint.

Exit Energy Saving Mode by setting the Thermostat Mode to Off/Heat/Cool/Auto through Z-Wave.

Please note that **Restore Default** would set the Energy Heat Set Point to 72 °F (22 °C) and Energy Cool Set Point to 80 °F (26.5 °C), thus exiting Energy Saving Mode.

Scheduling

Scheduling is only available for those with a compatible Z-Wave controller/gateway that supports scheduling function to program the climate control setting at different times of day.

The thermostat supports up to 8 schedules (one Z-Wave Schedule Block, 8 Schedule IDs). You can program the Heat Set Point, Cool Set Point, Humidity Mode, Moise Set Point, Dry Set Point, Fan Mode in each schedule.

Please note that excluding the thermostat from the network sets all schedules to **Disabled**. Performing **Restore Default** (in Advanced Settings Menu, page 17) sets all schedules to **Not Active**.

Thermostat Setpoint and Humidity Setpoint Support

Thermostat and humidity setpoints support size=1, precision=0; size=2, precision=0/1/2.

Fail Echo

Command Class Thermostat Mode/Setpoint/Fan mode, Humdity Control Mode/Setpoint support fail echo. If a gateway sends a wrong format or out of range value, the thermostat will report current value.

Supported Command Classes and Security

All supported command classes are available in S0, S2 unauthenticated and S2 authenticated security class.

Command Class	Version	Required Security Class
Association (Lifeline Association)	v2	Highest granted
Association Group Information	v3	Highest granted
Basic **Basic CC is mapped to thermostat Mode CC**	v2	Highest granted
Battery	v1	Highest granted
Clock	v1	Highest granted
Device Reset Locally	v1	Highest granted
Firmware Update MD	v5	Highest granted
Humidity Control Mode	v1	Highest granted
Humidity Control Setpoint	v1	Highest granted
Humidity Operation State	v1	Highest granted
Indicator	v3	Highest granted
Manufacturer Specific	v2	Highest granted
Multi Channel Association	v3	Highest granted
Multilevel Sensor	v6	Highest granted
Powerlevel	v1	Highest granted
Security	v1	None
Security 2	v1	None
Schedule	v3	Highest granted
Supervision	v1	None
Thermostat Fan Mode	v3	Highest granted
Thermostat Fan State	v1	Highest granted
Thermostat Mode	v3	Highest granted
Thermostat Operating State	v2	Highest granted
Thermostat Setpoint	v3	Highest granted
Transport Service	v2	None
Version	v3	Highest granted
Z-Wave Plus Info	v2	None

Regulatory Information

FCC ID: EF400203

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Industry Canada Notices

IC: 1078A-00203

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Limited Warranty

What is Covered?

Nortek Security & Control ("NSC") warrants to consumers who purchase this product for personal, family or household purposes new from NSC directly or from an authorized NSC dealer, that the product will be free from defects in materials and workmanship for a period of (1) year from the date of purchase. This warranty only applies if the product is installed at a residence in the 50 United States or District of Columbia, and only at the site of the original installation. It is not transferable. This warranty is not extended to resellers.

If a defect exists, NSC will have you ship the defective part or product to us and we will, at our option, either repair or replace it. This warranty does not cover the cost of labor to remove a defective part or product or to reinstall any repaired or replacement part or product.

This warranty does not cover defects or damages caused by improper handling, maintenance, storage, installation, removal or re-installation, misuse, non-factory authorized modification or alteration, use of incompatible accessories, electrical power problems or surges, impact by foreign objects, accident, fire, acts of God, normal wear and tear or shipping damage other than a shipment from NSC. Note that all NSC products are designed to be installed, removed and serviced by trained individuals or professionals.

Keep your original sales receipt as it will be required to obtain warranty service.

This warranty shall not be extended or restarted upon receipt of any repaired or replacement part or product under this warranty. No person is authorized to extend or otherwise modify this warranty.

How do I Obtain Warranty Service?

To obtain warranty service, email our Returns Department at returns@nortekcontrol.com. Include your name, address, telephone number, the model number of your product, a copy of your original sales receipt, and a description of the problem. Unless we need to discuss the situation further with you, a *Return Authorization Number* and shipping instructions will be emailed to you. If we need to discuss the situation further with you, we will call or email you. NSC may require troubleshooting on installed product before a Return Authorization Number is issued. Anything shipped to us without a *Return Authorization Number* will be automatically returned unopened. You are responsible for the charges for shipment to us, unless you are a California resident.

Limitations

THE DURATION OF ANY IMPLIED WARRANTY, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXCEED THE WARRANTY PERIOD PROVIDED HEREIN.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

NSC SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE BREACH OF ANY WRITTEN OR IMPLIED WARRANTY.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other legal rights which vary from State to State.

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