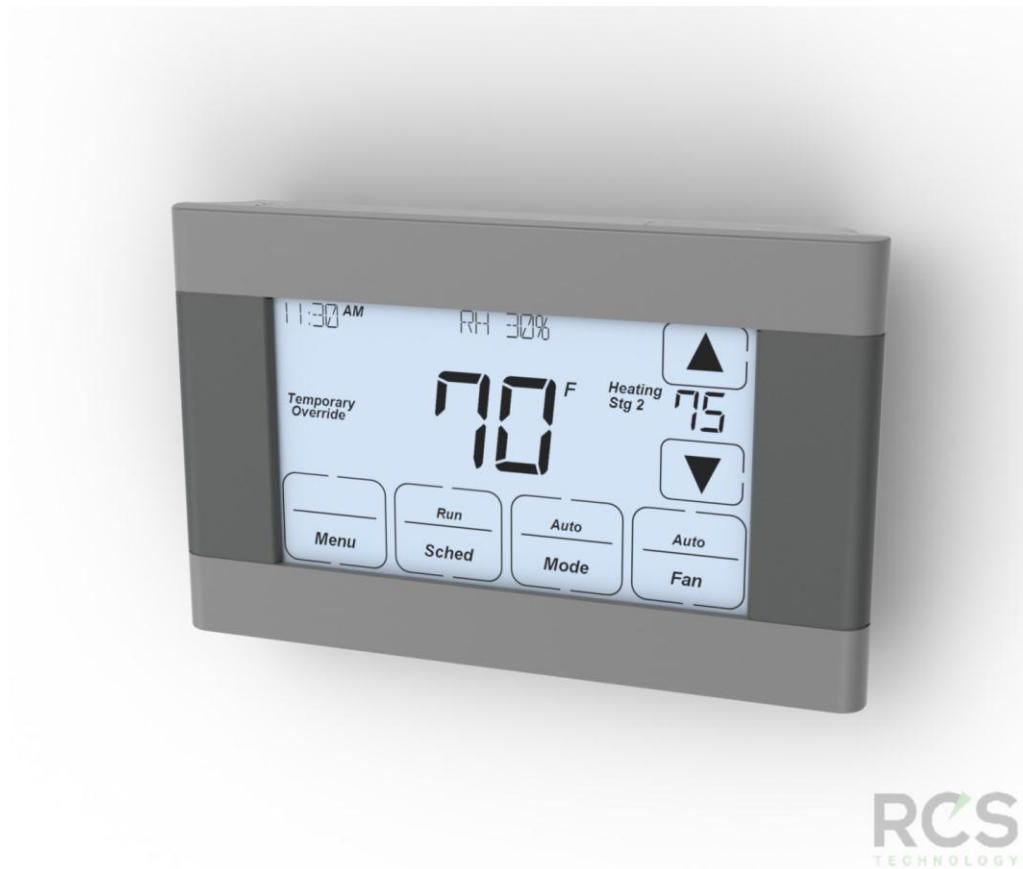# Trane Z-Wave Thermostat

TCONT624AZ32DAA

Installation and Users Instructions

Installation

This thermostat is compatible with most HVAC systems, including the following:

- 24VAC systems Note: requires both the R and C wires unless battery powered.
- Standard gas/oil/electric heating 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 Auxiliary heating (heat strips)
- Do NOT use for line voltage controls (120/240VAC)

24VAC Power
The thermostat **requires** both the 24VAC common wire "C" (typically blue wire) and the 24VAC hot wire, "R" (typically red wire) to operate. If the C wire is not present, an external 24VAC transformer is required.

Installation Steps

- Remove old thermostat
- Install TZ45H
- Set up the thermostat for the HVAC system
- Install into a Z-Wave network

Remove old thermostat

- Turn off power. Usually at the heating/cooling system or circuit- breaker panel.
- Remove cover of old thermostat to expose the wiring terminals
- ***Take a picture of the wiring terminals!***
- ***Mark the wires attached to the terminals with the wiring labels included***
- Use the terminal labels and *not the wiring color* to mark the wires
- Remove the old thermostat base
- Caution. Don't let the wires slip into the wall.

Take a Picture!
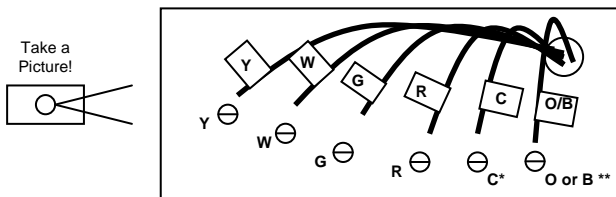
Typical thermostat connections.

* Note: the C wire (24V common) may not be connected on the old thermostat.

** O or B for Heat Pump systems only

Mark the wires according to the terminal markings.
There may be additional wires. Mark these according to the terminal markings.   Y1, Y2, W1, W2, RC, RH

Taking a picture of the old thermostat wiring terminals before you disconnect them is a good idea. If troubleshooting is required, this information will be extremely useful for the technical support contact. If you need to reinstall the old thermostat, the picture will guide the proper reconnection of the wires.

Wiring colors. While the wiring terminals markings are intended to match the wire color (R=red, G=green, W=white, Y=yellow), not all installations were correctly installed this way.
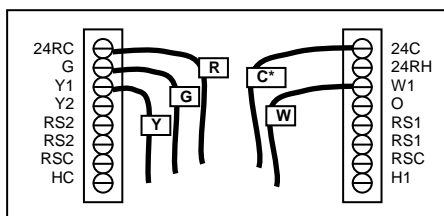Be sure to follow the terminal marking when marking the wires, even if the wire color doesn't match.

Mount the thermostat base

Mount the thermostat base to the wall using the wall anchors and screws provided.
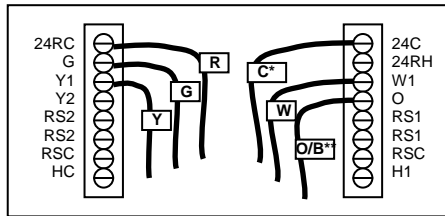Level as required.

Connect the wires – most common connections

A) Single Stage Gas Heating & Cooling System.

*C wire (24VAC common) must be installed. **If no C wire is available, an external transformer is required. See page x**

B)   Single Stage Heat Pump System

```
24RC                              24C
  G            R       C*         24RH
 Y1                               W1
 Y2          G                    O
RS2                     W         RS1
RS2         Y                     RS1
RSC                               RSC
 HC                 O/B*          H1
```

If there are additional wires, see the wiring diagrams on page 4 and 5.

Check connections

- Check that the wires are screwed into the terminal blocks firmly.

- Gently pull on the wires to confirm the connection.

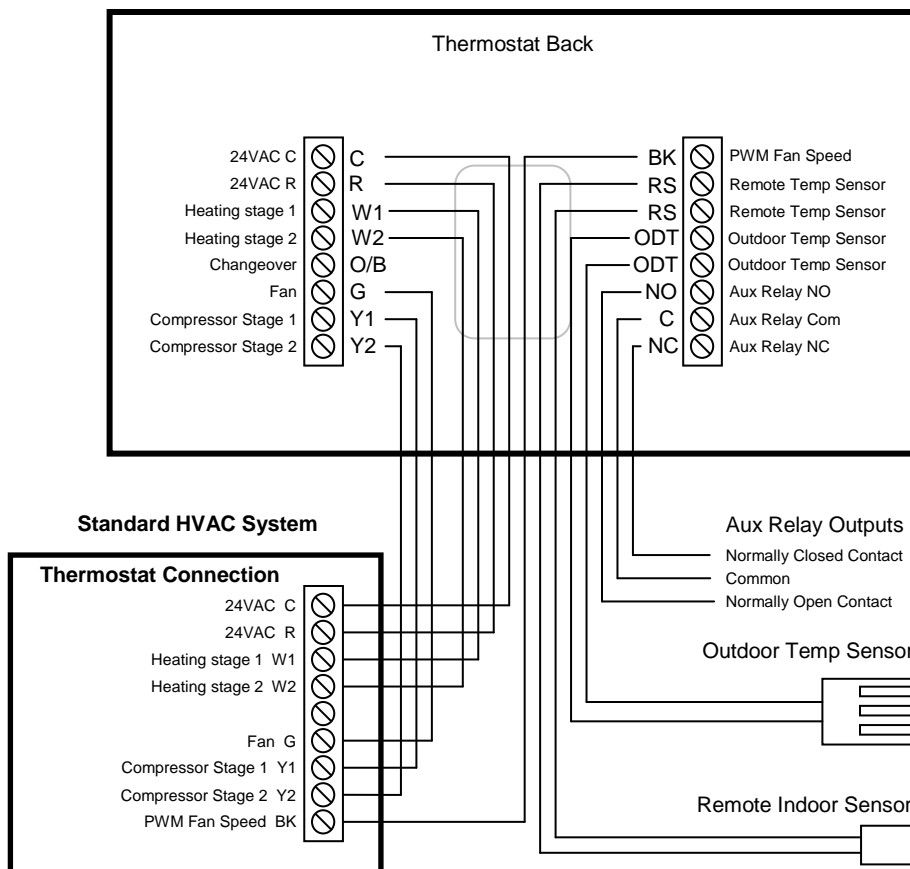- Push all the excess wiring back into the wall.

Mount the thermostat

Install the thermostat on to the base.

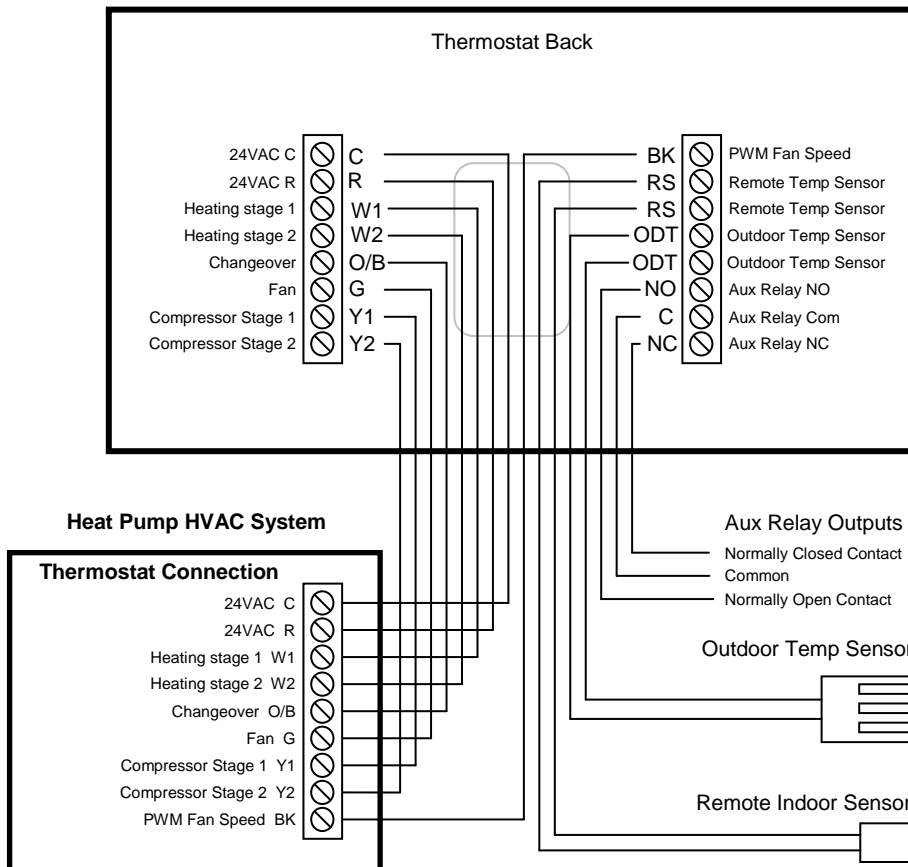Turn on the power at the HVAC system or breaker panel.

Wiring Diagrams

Standard Gas/Electric HVAC System

Thermostat Back

24VAC C	C		BK	PWM Fan Speed
24VAC R	R		RS	Remote Temp Sensor
Heating stage 1	W1		RS	Remote Temp Sensor
Heating stage 2	W2		ODT	Outdoor Temp Sensor
Changeover	O/B		ODT	Outdoor Temp Sensor
Fan	G		NO	Aux Relay NO
Compressor Stage 1	Y1		C	Aux Relay Com
Compressor Stage 2	Y2		NC	Aux Relay NC

Standard HVAC System

Thermostat Connection

24VAC C	
24VAC R	
Heating stage 1 W1	
Heating stage 2 W2	
Fan G	
Compressor Stage 1 Y1	
Compressor Stage 2 Y2	
PWM Fan Speed BK	

Aux Relay Outputs

Normally Closed Contact
Common
Normally Open Contact

Outdoor Temp Sensor

Remote Indoor Sensor

Wiring Diagrams

Heat Pump HVAC System

Thermostat Back

24VAC C	C		BK	PWM Fan Speed
24VAC R	R		RS	Remote Temp Sensor
Heating stage 1	W1		RS	Remote Temp Sensor
Heating stage 2	W2		ODT	Outdoor Temp Sensor
Changeover	O/B		ODT	Outdoor Temp Sensor
Fan	G		NO	Aux Relay NO
Compressor Stage 1	Y1		C	Aux Relay Com
Compressor Stage 2	Y2		NC	Aux Relay NC

Heat Pump HVAC System

Thermostat Connection

24VAC C	
24VAC R	
Heating stage 1 W1	
Heating stage 2 W2	
Changeover O/B	
Fan G	
Compressor Stage 1 Y1	
Compressor Stage 2 Y2	
PWM Fan Speed BK	

Aux Relay Outputs

Normally Closed Contact
Common
Normally Open Contact

Outdoor Temp Sensor

Remote Indoor Sensor

Thermostat Setup

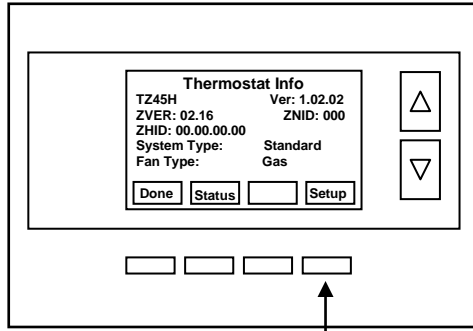The thermostat must be set up to match the HVAC System type and configuration for proper operation.

Check the current configuration settings by pressing the Menu button to go to the Menu Selection Screen. Then select the Thermostat Info menu item.
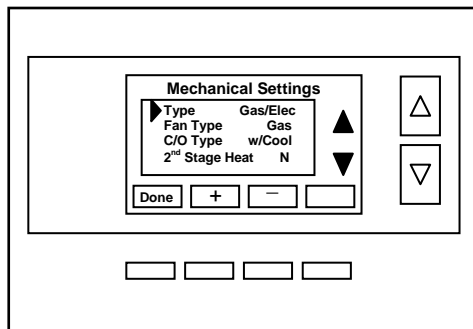
Thermostat Info Screen
Check the HVAC System Type and Fan Type info displayed.
If this matches the HVAC system, no further setup is required.
If not, press the Setup button to go the HVAC Mechanical settings menu.

```
            Thermostat Info
TZ45H                 Ver: 1.02.02       △
ZVER: 02.16           ZNID: 000
ZHID: 00.00.00.00
System Type:      Standard              ▽
Fan Type:         Gas

 Done  Status        Setup
```

Press the Setup button to go to the HVAC System Mechanical Settings screen

```
         Mechanical Settings
► Type           Gas/Elec      ▲         △
  Fan Type            Gas
  C/O Type        w/Cool
  2nd Stage Heat      N         ▼         ▽

 Done    +      —
```
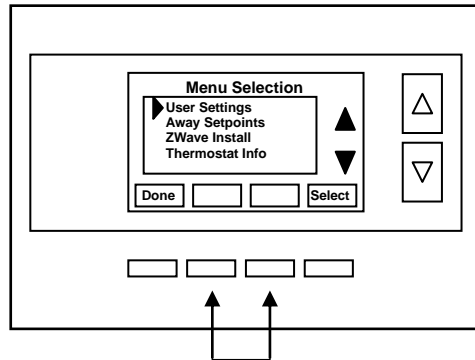
Thermostat Setup
Select the settings to match the HVAC system:
1. HVAC system type: Gas/Electric or Heat Pump
2. Fan type (for gas/elec systems only): Gas or Electric
3. C/O (changeover valve – for Heat pump systems only) type: w/Cool or w/Heat
4. 2nd Stage Heat: N if no second stage, Y if yes.
5. Aux Heat (for Heat pump systems only): N if no Aux heat, Y if yes
6. 2nd Stage Cool: N if no second stage cooling, Y if yes

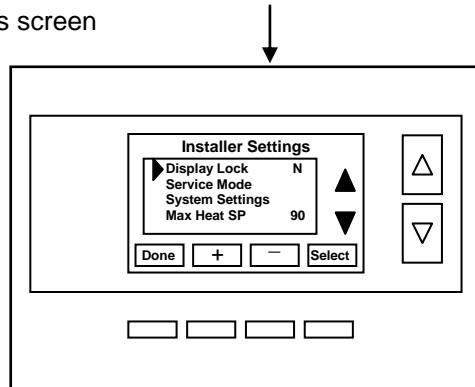# Advanced System Setup – Installer Settings

The TZ45H has advanced system setup options. These settings are accessed in the **Installer Settings** screen on the thermostat. The Installer Settings is a hidden screen. To access it, press the MENU button to switch to the Menu Selection screen. Press and hold the middle two buttons for 5 seconds to switch to the Installer Settings Screen.

Thermostat Main Menu

```
            Menu Selection
        ▶ User Settings
          Away Setpoints         ▲
          ZWave Install
          Thermostat Info        ▼

        Done          Select
```

Press and hold two middle buttons to enter the Installer Settings screen

Installer Settings screen

```
            Installer Settings
        ▶ Display Lock      N
          Service Mode           ▲
          System Settings
          Max Heat SP       90   ▼

        Done  +    −   Select
```

Installer Settings Menu items

Display Lock   Range: Y or N   Default: N
Y = Display LOCKED
N = Display unlocked
Allows you to lock or unlock the thermostat buttons. When the buttons are locked, you can still access the main menu, but you will not be allowed to select any menu options. The Installer Settings hidden button operation is always operational, allowing you to return to this screen and turn Display Lock off.

Service Mode
Test Mode   Range: Y or N   Default: N
Y= Test mode on. Reduces all delays to 10 sec for quicker system testing
N= Test mode off. Normal system delays

CAUTION: in test mode all system safety delays are shorten. Do not operate the system compressor in test mode. Disconnect Y1 or Y2 outputs if using test mode on a live system.

System Settings   Submenu: Sets the HVAC operational settings below

Mechanical Settings Submenu: Sets HVAC system type and configuration

Type   Range: Gas/Elec or Heat pump   Default: Gas/Elec
Selects HVAC type, Gas/Electric or Heat pump

Fan Type   Range: Gas or Elec   Default: Gas
Selects the Fan type if system is Gas or Electric

C/O Type   Range: w/Cool or w/Heat   Default: w/Cool
Selects the Heat Pump Changeover Valve type

2nd Stage Heat   Range: Y or N   Default: N
Enables the 2nd Stage Heat operation

Aux Heat (HP)   Range: Y or N   Default: Y

Enables the Auxiliary Heat operation. Typically the Aux Heat will be heat-strips in a Heat Pump system

2nd Stage Cool   Range: Y or N   Default: N
Enables the 2nd Stage Cool operation

Schedule Enable   Range: Y or N   Default: N
When enabled, the local thermostats scheduler function is enabled.

Recovery Enable   Range: Y or N   Default: N
For Heat Pump Systems. Intelligent setback recovery is an automatic advance start of heating to allow the system to be at setpoint by the schedule time, without the use of Aux heating.

Delta Settings : The Delta T Setting is the delta, or difference between, the setpoint and current temp for determining when a heat or cool call comes on. The "delta" is the number of degrees away from <u>setpoint</u>.

H/C Delta   Range: 3 - 15 degrees.   Default: 3F (1C)
Sets the minimum separation between heating and cooling setpoints. Attempts to lower the cooling below the heating setpoint by this amount will PUSH the heating setpoint down to maintain this separation. Same for setting the heating setpoint above the cooling setpoint, it will PUSH the cooling setpoint up to maintain this separation.

Fan Purge   Range: 0, 30 to 120 seconds   Default: 0

Heating Delta Stage 1 ON   Range: 1 to 8 degrees   Default: 1
        Sets the delta from setpoint that stage 1 heating starts.

Heating Delta Stage 1 OFF   Range: 0 to 8 degrees   Default: 0
        Sets the delta from setpoint that stage 1 heating stops.
        Stage 1 turns off at setpoint + Delta Stage 1.

Heating Delta Stage 2 ON   Range: 1 to 8 degrees   Default: 2
        Sets the delta from setpoint that stage 2 heating starts.

Heating Delta Stage 2 OFF   Range: 0 to 8 degrees   Default: 0
        Sets the delta from setpoint that stage 2 heating stops.
        Stage 2 turns off at setpoint + Delta Stage 2.

Heating Delta Stage 3 ON   Range: 1 to 8 degrees   Default: 3
        Sets the delta from setpoint that stage 3 heating starts.

Heating Delta Stage 3 OFF   Range: 0 to 8 degrees   Default: 0
        Sets the delta from setpoint that stage 3 heating stops.
        Stage 3 turns off at setpoint + Delta Stage 3.

Cooling Delta Stage 1 ON   Range: 1 to 8 degrees   Default: 1
        Sets the delta from setpoint that stage 1 cooling starts.
Cooling Delta Stage 1 OFF   Range: 0 to 8 degrees   Default: 0
        Sets the delta from setpoint that stage 1 Cooling stops.
        Stage 1 turns off at setpoint - Delta Stage 1

Cooling Delta Stage 2 ON   Range: 1 to 8 degrees   Default: 2
        Sets the delta from setpoint that stage 2 cooling starts.

Cooling Delta Stage 2 OFF   Range: 0 to 8 degrees   Default: 0
        Sets the delta from setpoint that stage 2 Cooling stops.
        Stage 2 turns off at setpoint -Delta Stage 2.

<u>Max Heat SP</u>   Range: 40F to 109F (4C-43C) Default: 90F (32C)
Sets the maximum heating setpoint value. Will not ramp or accept setpoints higher that this maximum.

<u>Min Cool SP</u>   Range: 44F to 113F (6C-45C) Default: 60F (15C)
Sets the minimum cooling setpoint value. Will not ramp or accept setpoints lower than this minimum.

<u>Minimum Run Time (MRT)</u>   Range: 1- 9 Minutes   Default: 3
Sets the minimum run time before a heating/cooling cycle can turn off.
Sets heating/cooling cycle time. Prevents rapid cycling.

<u>Minimum Off Time (MOT)</u>   Range: 5-9 Minutes   Default: 5
Sets the minimum off time before another heating/cooling cycle can begin. Provides compressor short cycle protection.

<u>Fan Cycler</u>
The fan cycler function cycles the HVAC system fan for an ON period followed by an Off period continuously. Used to provide minimum air ventilation requirements. When the Fan ON time is set to a value greater than 0, an additional "Cycler" FAN mode is present when pressing the FAN button.
         Fan ON Time   Range: 0-120 minutes   Default: 0 (=OFF)
         Fan OFF Time   Range: 10-120 minutes   Default: 10

<u>Remote Sensors</u>   Submenu for Sensor Setup

RS1 Type	Range: A curve, Type 2, Type 3	Default: Type 3
RS2 Type	Range: A curve, Type 2, Type 3	Default: Type 3
RS2 Location	Range: IN (indoors), OUT (outdoors)	Default: IN
R1 Node ID	ID for a Z-Wave remote sensor	Default: 0
R2 Node ID	ID for a Z-Wave remote sensor	Default: 0

Humidity Settings: Submenu for humidity settings

RH Display   Range: Off or On   Default: On
Turns on or off the RH display on the main thermostat screen.

RH Setpoint   Range: 20 to 80 in 5% steps   Default: 55%
Sets the RH setpoint for Humidity control functions.

RH Setpoint Away   Range: 20 to 80 in 5% steps   Default: 65%
Sets the RH setpoint when in the AWAY mode.

RH Temp Delta   Range: 1 to 5 deg   Default: 2 deg
Sets the maximum overcooling temperature allowed for humidity control.

RH Setpoint Delta   Range: 1 to 10 %   Default: 5 %
Sets the % above the RH setpoint that the Humidity control will be activated.

RH On Time   Range: 0 to 60 minutes   Default: 30 min
Sets the maximum runtime for Humidity control to try to correct RH level.

RH Off Time   Range: 0 to 60 minutes   Default: 30 min
Sets the minimum off time for Humidity control after On time expires.

RH Off Delta   Range: 0 to 10 %   Default: 2%
Sets the % RH below the RH setpoint that the Humidity control will lower the room RH to before turning off.

Relay Setup (for aux relay A1 output)

A1 Relay mode   Range: see below   Default: Off
Off. No relay function
Humidify: Relay turns on when RH is below humidity setpoint
Dehumidify: Relay turns on when RH is above humidity setpoint
Net: Z-Wave commands turn Relay On and Off.
Configuration parameter #95 See Z-Wave Command Summary
Vent: Relay turns on when Vent is active.
DH-Fan: HVAC system fan speed control during dehumidification.

A1 Fan Interlock   Range: Off, On   Default: Off
Turns on fan output (G) when relay A1 is on

Restore Defaults   Range: Yes, No   Default: No
Restores all settings to factory defaults.
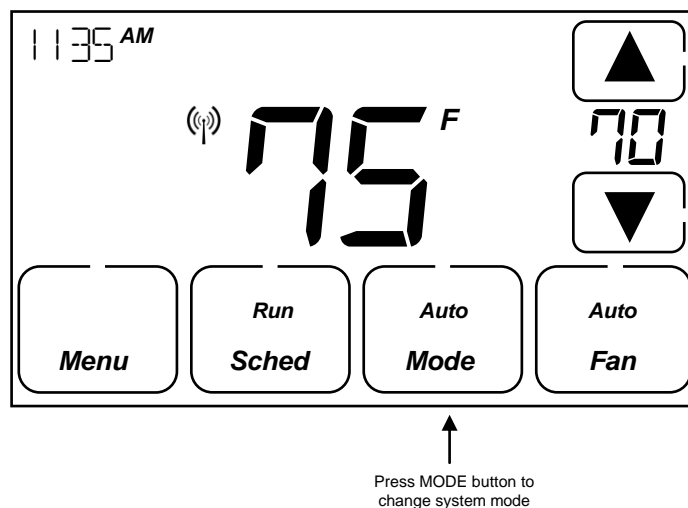Press Yes to restore defaults
Press No to exit and not restore defaults

RCS
TECHNOLOGY

Model XR624

Operation Guide

XR624 Thermostat Screen

<u>Setting the System Mode</u>

11:35 AM 75 F 70

Menu   Run Sched   Auto Mode   Auto Fan
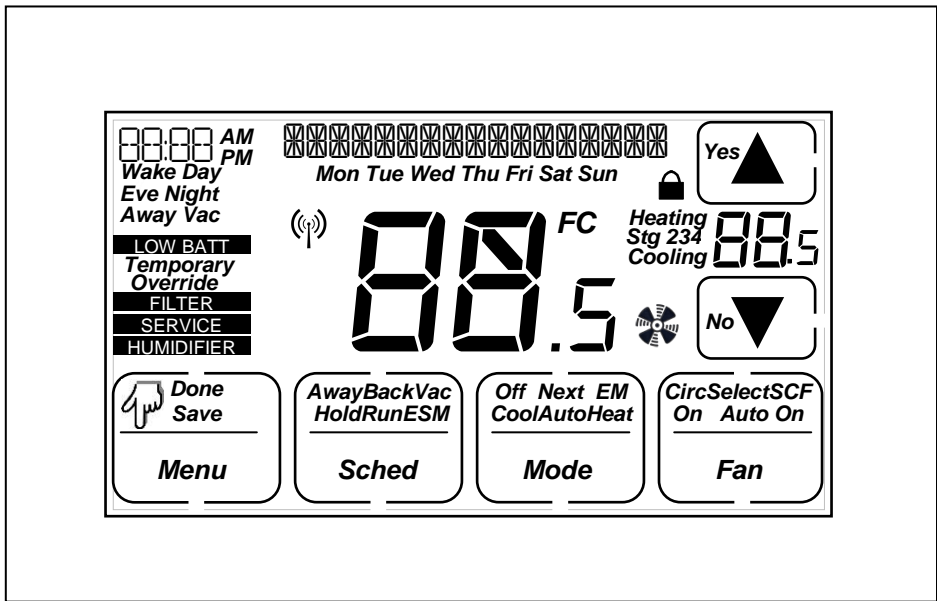
Press MODE button to
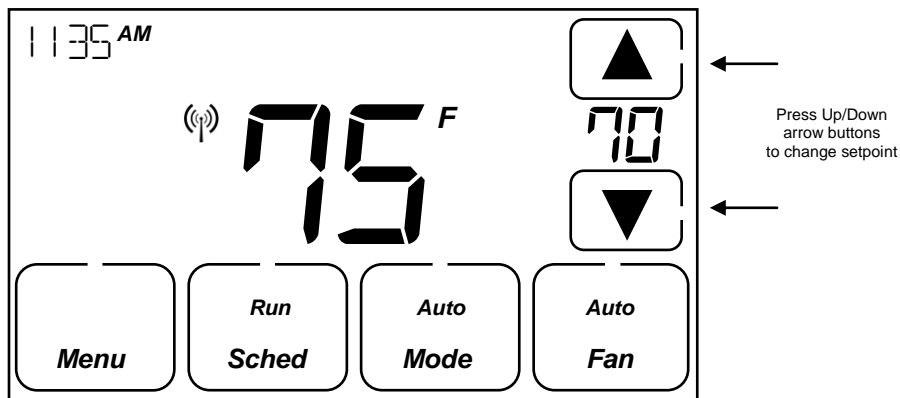change system mode

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 come on according to the heating and cooling setpoints. The system will automatically switch between heating and cooling modes as needed to maintain the setpoints.

Special Heat Pump Mode: Emergency Heat
- **Heat-E:** 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 come on 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.***

Setting the Heating or Cooling Temperature Setpoint

```
 11:35 AM

 ((•))  75 F       ▲
                   70
                   ▼

 Menu   Run    Auto   Auto
        Sched  Mode   Fan
```

Press Up/Down
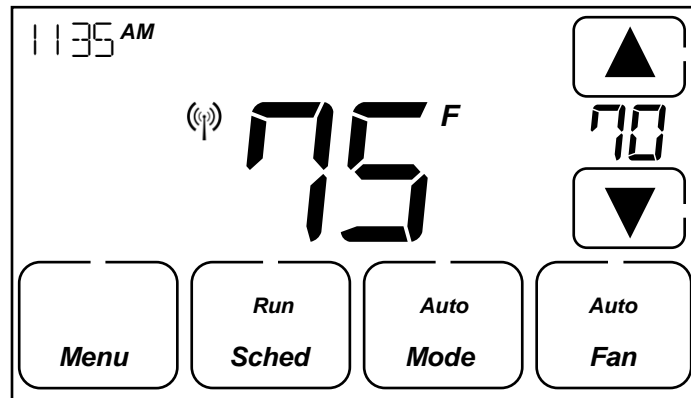arrow buttons
to change setpoint

Setpoint Change
To change the setpoint, press the Up or Down arrow buttons. The screen will switch to the   setpoint change screen (as above) and show the current setpoint of the current heating or cooling mode. Adjust setpoint temperature up or down with the arrow buttons.

Note! *When in the Setpoint Change screen, pressing the MODE button will switch the setpoint being displayed between the Heat and Cool setpoints.*

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 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.

<u>Setting the Fan Mode</u>

```
 11:35 AM

    (((•)))  75 F        ▲
                         70
                         ▼

 ┌──────┐ ┌──────┐ ┌──────┐ ┌──────┐
 │      │ │ Run  │ │ Auto │ │ Auto │
 │ Menu │ │ Sched│ │ Mode │ │ Fan  │
 └──────┘ └──────┘ └──────┘ └──────┘
                                ↑
```

Press the FAN button to
change the fan mode

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.

Thermostat Menu Mode

The Thermostat has a menu of setup and information displays.
To change to the Menu Mode, press the Mode button

The display will change to the Menu Mode and display the Setup screen.
Use the Up/Down arrow buttons to scroll through other menu items.
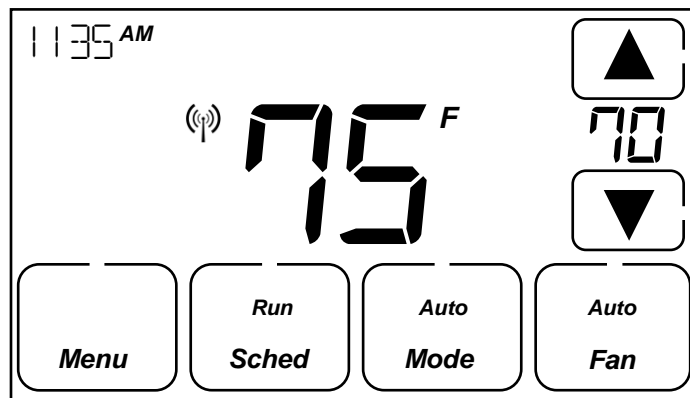
Press the Menu button to go
to the Menu mode

Menu Mode options
- **SETUP**   User preference settings
- **SYSTEM** Thermostat HVAC system settings
- **ZWAVE**   Z-Wave network install or remove
- **CLOCK**   Setting the thermostat time and day
- **INFO**   Displays thermostat version and setup info

SETUP Menu
User preference settings.

FAHRENHEIT OR CELSIUS. Select the temperature display mode.

BACKLIGHT TIMEOUT. Sets the time from last button press that the backlight will turn off. Range:10-30 seconds. Note: long backlight timeouts will reduce battery life.

If the thermostat is powered from 24VAC, the backlight timeout can be set to "0" which will keep the backlight on continuously.

SENSOR CALIBRATION Change the temperature calibration by +/- 7 degrees.
Use the Up/Dn arrow buttons to change to the desired display temperature.

SYSTEM Menu

SYSTEM TYPE. Select the system type, **STANDARD** or **HEAT PUMP**

FAN TYPE (Standard systems only).
Select fan type: **GAS** (typical default setting) or **ELECTRIC**

CHANGE OVER TYPE (Heat Pump systems only).
Select the Changeover type:
Changeover WITH COOL (typical default setting)
Changeover WITH HEAT

See Installation Guide for more information on System setup and the Advanced Systems Menu

Z-WAVE Menu

This menu item allows the thermostat to be installed or uninstalled from a Z-Wave network. Follow the instructions in the Z-Wave Installation section.

INSTALL Press to install the thermostat, if not already installed in a Z-Wave Network (when a controller is in install mode)

REMOVE Press to remove the thermostat from a Z-Wave Network

CLOCK Menu

Set the time and day of the week.

Press select to set the DAY. The current day of the week setting will be displayed.
Press the UP/DN arrows to change the day of the week desired.

Press select to set the TIME. The current time will be displayed.
Press the UP/DN arrows to change the time.

INFO Menu

The INFO menu displays information about the thermostat. Use the Up/Dn buttons to scroll through the various items.

Thermostat information displayed:

VERSION Thermostat firmware version
ZWAVE Z-Wave firmware version
NODE ID Z-Wave Node ID
HOME ID Z-Wave Home ID
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

Thermostat Operation

Minimum Run Time (MRT)
The thermostat has a Minimum Run Time (MRT) 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 you change the setpoint to a temperature that would satisfy the call, until the MRT expires. Changing the Mode to OFF will cancel the MRT and the system will turn off immediately. The MRT can be adjusted in the Advanced Settings menu of the thermostat.

Note: The MRT status is shown in the thermostat Status display.

Minimum Off Time (MOT)
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 5 minutes delay to assure compressor protection.

Note: The MOT status is shown in the thermostat Status display.

Z-Wave® Operation

The XR624 is based on the Slave Library in the Z-Wave Ecosystem.

Z-Wave controllers from various manufacturers support the Z-Wave process of adding or removing a device from a network. The thermostat is a Z-Wave Slave and a Z-Wave controller is required as the primary controller to setup and maintain the network.

The following procedure will allow the thermostat to be installed (inclusion) or removed (exclusion) from a Z-Wave network.

*NOTE: If the thermostat is installed in a network while running on **batteries**, it will be installed as a FLiRs Z-Wave type of device. This is a power saving mode that converses the batteries by keeping the radio asleep most of the time. However, in this mode, the thermostat does not act as a router node in the Z-Wave network.*

*If the THERMOSTAT is installed in a network while powered by **24VAC,** it will be installed as an always-listening device and can act as a router node in the Z-Wave network.*

Caution! Once installed in a Z-Wave network, if you change how the thermostat is powered (from batteries to 24VAC or vice versa), you must remove and re-install the thermostat in the Z-Wave network for it to work correctly.

Before installing the thermostat into a Z-Wave Network, check that is not already installed in a network by viewing the Home and Zone ID's located in the **INFO** screen. An un-installed thermostat will show a Node ID of 0. Consult your controller's user manual for details on removing a device from a Z-Wave network.

Inclusion: Installing the thermostat into an existing Z-Wave network

1. Set your primary controller to **Install or Include** mode, to add the THERMOSTAT as a node on your network (see your controller's user manual for detailed instructions).

2. Press the **FAN button** and hold until the screen changes to the Menu screen.

3. Press the **UP button** until **ZWAVE** is shown in the Status Display line then press **Select**.

4. **INSTALL** should be shown on the status line. Press **Select** to install in the network**.** The status line will show the progress as the THERMOSTAT is added into the network. Wait until **SUCCESS** or **FAILED** is shown on the status display.

5. Press **Done** to exit the ZWAVE screen.

6. Press **Done** again to exit the Menu screen.

7. The Radio Icon should be shown in the Thermostat Main screen indicating the thermostat is enrolled into a network.

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 Node ID and Home ID in the **INFO** screen.

Z-Wave Network Note: *Inclusion and exclusion are always done at normal transmit power mode.*

Network Wide Inclusion
If your controller supports Network Wide Inclusion (NWI), then you can optionally set the primary to NWI include mode. Please note that NWI inclusion mode does not end when you have included a new node. This allows multiple nodes to be included without having to physically go back to the controller to initiate the next inclusion. Therefore you must manually terminate NWI inclusion mode at the controller when you have finished including any new nodes to the network. Since intermediate included nodes will assist the inclusion process by routing messages, we recommend that nodes close to the primary controller be installed first, proceeding out in consecutive rings from the controller.

Exclusion: Removing the thermostat from a Z-Wave network

1. Set your primary controller to **Uninstall or Remove** mode to remove the thermostat as a node on your network (see your controller's user manual for detailed instructions).

2. Press the **FAN** button and hold until the screen changes to the Menu screen.

3. Press the **UP** button until **ZWAVE** is shown on the status line then press **Select**.

4. **REMOVE** should be displayed. Press **Select** to remove from the network. The status display will show the progress as the thermostat has been removed from a network. Wait until **SUCCESS** or **FAILED** is shown on the status line.

5. The controller will indicate the thermostat has been removed from the network.

6. The Radio Icon will disappear from the Thermostat Main screen.

Note: You can confirm the thermostat has been removed by checking that the Node ID is 0 in the INFO screen.

FCC/IC

INFORMATION TO USER

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.

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.

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe[B est conforme à la norme NMB-003 du Canada.

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.