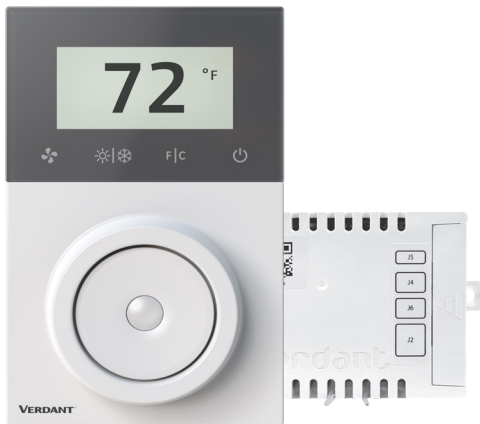


ZX Wireless Series

Wireless Energy Management Thermostat
with Built-In Occupancy Sensor and External
HVAC Controller

USER GUIDE

AUGUST 2024



VERDANT
by **COPELAND**

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Introduction

Verdant ZX Series Energy Management Thermostats deliver unprecedented energy savings without compromising comfort.

An integrated occupancy sensor uses a combination of motion and thermal sensing technologies for accurate occupancy detection. Reliable occupancy detection allows for energy savings when rooms are unoccupied.

Energy saving presets eliminate the guesswork and make it easy to adjust the energy saving settings.

Fully configurable energy saving settings allow for remote customization of the thermostat energy saving settings to fit any situation.

Comprehensive configuration options ensure full compatibility with virtually any existing or emerging HVAC system with up to two heating and cooling stages.

Built-in wireless mesh-networking enables cloud-based online management that can be self-managed or remotely managed using Verdant EI™.

SKUs Referenced in this Manual

This user guide includes instructions on how to install each of the following compatible SKUs. SKUs listed below contain combinations of the devices in [Technical Specifications \(page 113\)](#).

Product Type	SKU(s)	Description
Thermostats	ZX-TW	Wireless thermostat *
	ZX-TW-GEA	
	ZX-TW-HVCC	
	ZX-TW-HCR	
	ZX-RSW	
	ZX-RSW-MIE	
	ZX-RSW-LG	
	ZX-RSW-AZA-D	
	ZX-WU	
	ZX-NWU	
	ZX-TW-868	Wireless thermostat (868 MHz) *
	ZX-RSW-868	
	ZX-WU-868	
	ZX-NWU-868	
	ZX-TW-LIT	Wireless thermostat with occupancy-based lighting control *
	ZX-TW-LIT-AOS	
	ZX-TW-DLI-DKAA-1-XMF	Wireless thermostat with door lock integration (network access)
	ZX-TW-DLI-DKAA-2-XMF	
	ZX-TW-DLI-ONIT-XMF	

NOTE: * all thermostats have a networked option (-XMF).

Product Type	SKU(s)	Description
Thermostats	ZX-TW-LIT-DLI-DKAA- 1-XMF	Wireless thermostat with occupancy-based lighting control a door lock integration (network access)
	ZX-TW-LIT-DLI-DKAA- 2-XMF	
	ZX-TW-LIT-DLI-ONIT-XMF	
Accessories	ZX-LV	HVAC Controller
	ZX-HV	HVAC Controller, high voltage
	ZX-LV-868	HVAC Controller (868 MHz)
	ZX-HV-868	HVAC Controller, high voltage (868 MHz)
	ZX-OL-U	Online Connection Kit
	ZX-OL-U 868	Online Connection Kit (868 MHz)
	ZX-RN	Root Node
	ZX-RN-868	Root Node (868 MHz)
	ZX-AOS	Remote Occupancy Sensor
	ZX-AOS-868	Remote Occupancy Sensor (868 MHz)
	ZX-DWS	Door/Window Sensor with reed magnets
	ZX-DWS-868	Door/Window Sensor with reed magnets (868 MHz)
	ZX-TSW	Wireless Temperature Sensor
	ZX-TSW-868	Wireless Temperature Sensor (868 MHz)

Equipment Nomenclature

Before you begin installing Verdant equipment, we recommend you familiarize yourself with the various components that may be included in your shipment.



ZX Thermostat & HVAC Controller



Online Connection Kit



Occupancy Sensor



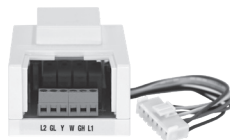
Temperature Sensor



Door/Window Sensor



Adaptors for VRF Systems



Voltage Adaptor

Installation Considerations

Selecting the appropriate installation location of the thermostat and any accessories is crucial to the proper operation of your Verdant energy management system. The following guidelines should be adhered to in all cases.

The thermostat's occupancy sensor should face the bed area of the room or the area where the occupant will spend the most time.

Do not install the thermostat near windows or door vents, on an exterior wall, above or below supply vents, or other less occupied areas.

THE THERMOSTAT MUST NOT BE INSTALLED IN THE VICINITY OF METAL STRUCTURES OR SURFACES INCLUDING METAL AIR DUCTING THAT MAY BE IN THE WALL. METAL STRUCTURES AND SURFACES BETWEEN THE THERMOSTAT AND CONTROL CARD AND/OR THE ONLINE CONNECTION KIT SUCH AS METAL CABINETS OR DOORS/ ELEVATOR SHAFTS SIGNIFICANTLY REDUCE THE RANGE OF THE WIRELESS SIGNAL AS THEY DEFLECT THE SIGNAL AND THEY DON'T ALLOW IT TO PASS THROUGH THEM, THUS REDUCING THE SIGNAL STRENGTH BETWEEN THE DEVICES MENTIONED.

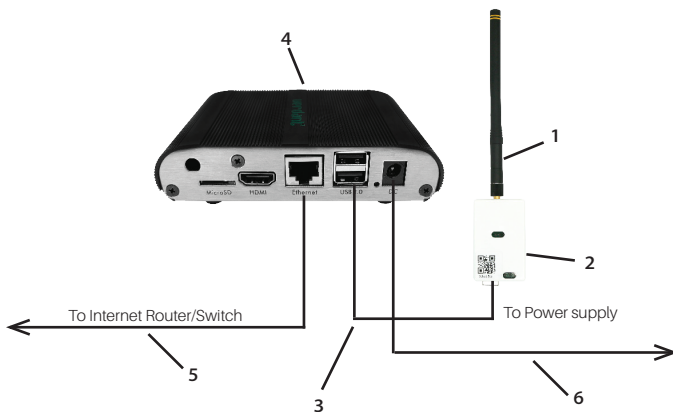
Network Installation

BEFORE STARTING THE INSTALLATION OF THE NETWORKED THERMOSTATS, ENSURE THE ONLINE CONNECTION KIT IS CONNECTED TO THE INTERNET.

THE ANTENNA MODULE MUST BE INSTALLED WITHIN 100FT FROM THE FIRST 2 TO 3 THERMOSTATS, AND MUST NOT BE INSTALLED NEAR METAL STRUCTURES OR SURFACES.

TO PREVENT POWER RELATED ISSUES, PLUG THE SERVER INTO A UPS (UNINTERRUPTED POWER SUPPLY) UNIT.

Connecting Online Connection Kit



1. Screw Antenna (1) onto Wireless Receiver (2).
2. Connect Wireless Receiver (2) to Server (4) using supplied USB cable (3).
3. Affix Wireless Receiver (2) to wall with double sided adhesive tape.
4. Orient Antenna (1) to point upwards to the closest room in which a thermostat will be installed.
5. Connect Server (4) to the LAN port with the supplied RJ-45 cable (5).
6. Plug Server (4) into electrical outlet with power cord (6).

Configuring Online Connection Kit

1. Ensure Online Connection Kit is receiving a private IP from a DHCP server.

NOTE: A public IP will not work.

2. Ensure MAC address is properly whitelisted if it needs to bypass a login (splash) page to reach the internet.

NOTE: MAC address is printed on a white sticker on bottom of Online Connection Kit.

3. If behind a firewall, ports 22, 80, and 443 must be open to INBOUND/OUTBOUND communication.

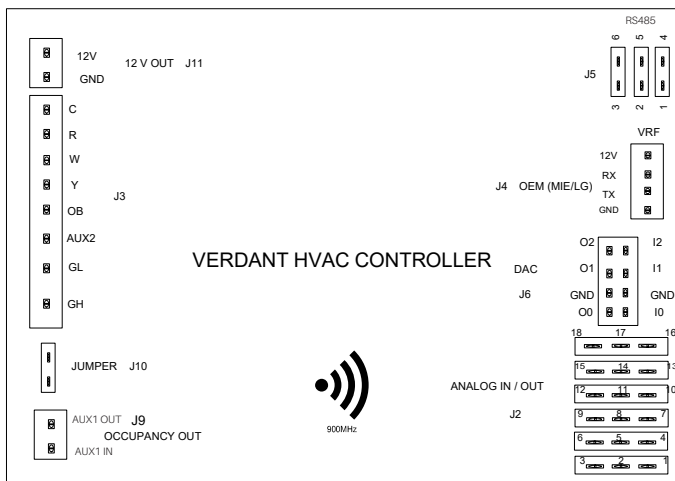
CONFIRM THE ONLINE CONNECTION KIT IS COMMUNICATING PROPERLY WITH THE CLOUD SERVICE BY CALLING VERDANT TECHNICAL SUPPORT AT 1-877-318-1823.

HVAC Controller Installation

Introduction

Verdant HVAC Controllers enable wireless thermostat control of most HVAC units. The HVAC Controller has relay 24 VAC outputs, analog 0-10 VDC outputs, and digital data (RS485) outputs to allow for control of virtually any HVAC unit.

The illustration below indicates the various ports available on the HVAC Controller.



Installing HVAC Controller in 24 VAC Relay Units

1. Power off HVAC unit.
2. Mount HVAC Controller inside HVAC unit.
3. Use supplied wire harness to connect HVAC Controller to HVAC unit.
4. If applicable, set the unit to "External Thermostat" (Class 2) mode. Consult the HVAC unit documentation to determine how to set the unit to "External Thermostat" mode.

HVAC Controller 24 VAC Relay Connections (J3 Port)								J9 Port
C Black	R Red	W White	Y Yellow	OB Orange	AUX2 Brown	GL Purple	GH Green	AUX1 Blue
Common	24 VAC	Heat	Cool	Reverse Valve	Auxiliary	Fan Low	Fan High	OCC
NOTE: Functionality may change due to equipment code, see Appendix 2 - Equipment Codes (page 107) for further information. NOTE: If the HVAC unit has only one (1) fan speed, connect both fan control wires - Green and Purple - to the fan terminal (G).								

THE HVAC CONTROLLER ANTENNA MUST BE FACING THE THERMOSTAT AND MUST NOT BE TOUCHING OR ENCLOSED BY ANY METAL COMPONENTS IN THE HVAC UNIT.

THE HVAC CONTROLLER MUST BE MOUNTED SO IT CANNOT FALL INTO THE HVAC UNIT CONDENSATION PAN. USE PLASTIC CABLE TIES OR 3M COMMAND TAPE (NOT SUPPLIED).

Using Universal Input and Output Ports of HVAC Controller

The J6 port has three (3) universal inputs, three (3) universal outputs, and a ground. It functions in conjunction with the J2 jumper port and the J3 standard relay port. In cases where the standard 24 VAC relays of port J3 cannot control part of or all the analog controlled fan or heating/cooling modes of a specific HVAC system, the J6 port may be used to enable control of such a fan or mode (heating/cooling) or both fan and mode. A harness is provided for connections that require a J6 port.

The J6 port is often used in fan coil unit (FCU) applications where the fan and heating and cooling valves are controlled using analog 0-10 or 0-3 VDC output signal on pins O0, O1, or O2. The J2 jumper port is used in conjunction with J6, for selecting the device to be controlled per table below:

Output Connections (J6 Port)				
Output Number	O0	GND	O1	O2
Wire Color	White	Black	Yellow	Green
Set Functionality	Analog Heat	GND	Analog Cool	Analog Fan

Input Connections (J6 Port)				
Input Number	I0	GND	I1	I2
Wire Color	White/Black	Black	Yellow/Black	Green/Black

Using HVAC Controller to Power Wireless Thermostat (Optional)

The J11 port on the HVAC Controller may be used to supply 12 VDC power to a wireless thermostat, if desired.

Use the supplied wire harness to connect the J11 port to the back of the wireless thermostat.

12 VDC Output (J11 Port)	
12 VDC	GND

Checking Firmware Version

TBD.

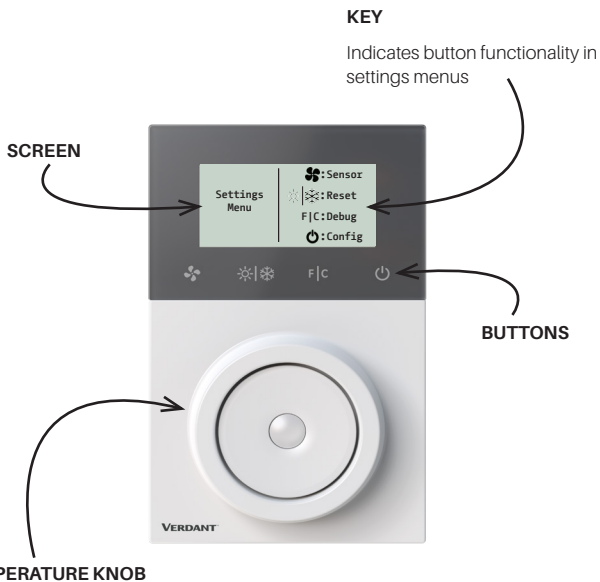
Using HVAC Controller's Dry Contacts to Control External Devices

The J9 port on HVAC Controller can be used as a dry contact for control of external devices such as lighting relays and dampers.

Connect jumper on J10 to create a wet contact supplying power from R (24 VAC) and C (Common).

Thermostat Installation

Thermostat Details



TEMPERATURE KNOB

Rotate clockwise to increase,
counterclockwise to decrease

Indicated by  in settings menu

Mounting Thermostat to Wall

1. Select appropriate installation location for thermostat per below:

THE THERMOSTAT'S OCCUPANCY SENSOR SHOULD FACE THE BED AREA OF THE ROOM OR AREA WHERE OCCUPANT WILL SPEND THE MOST TIME.

THE THERMOSTAT MUST NOT BE INSTALLED IN THE VICINITY OF METAL STRUCTURES OR SURFACES INCLUDING METAL AIR DUCTING. DO NOT INSTALL THERMOSTAT NEAR WINDOWS OR DOORS WHICH MAY ALLOW A DRAFT, ON AN EXTERIOR WALL, ABOVE OR BELOW SUPPLY VENTS, AND OTHER LESS OCCUPIED AREAS.

2. If using a wall plate, place it over hole in wall left from previous thermostat and mark two locations for drilling holes.
3. With the faceplate removed, place thermostat on wall in installation location and mark location for drilling holes for two (2) mounting screws.

DO NOT OVER TIGHTEN THE BACK PLATE TO THE WALL. FOR UNEVEN SURFACES INSTALL A WALL PLATE.

4. Drill two (2) 3/16" holes in wall and insert two (2) wall anchors (supplied).
5. Use two (2) screws (supplied) to securely mount thermostat to wall.
6. Insert two (2) AAA batteries (not supplied) in thermostat battery compartment. The thermostat can also be powered with 12 VDC or 24 VAC.

Thermostat Configuration

Configuring Thermostat

With the thermostat and HVAC unit powered, access the configuration screen:

1. Ensure thermostat is powered.
2. Touch and hold  and  buttons simultaneously for three (3) seconds. The settings menu will appear.
3. Touch  button to access configuration menu.

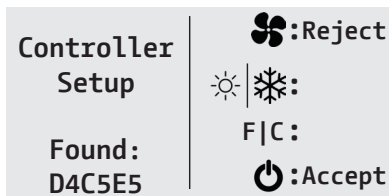
NOTE: The thermostat configuration screen has a 30-second time-out. If no action is taken within 30 seconds, the thermostat will exit configuration settings.

To ensure proper operation of the HVAC unit, complete the following steps:

1. [Pairing Thermostat with HVAC Controller \(page 20\)](#)
2. [Setting MESH ID \(page 21\)](#)
3. [Entering Room Number \(page 22\)](#)
4. [Configuring Equipment Settings \(page 23\)](#)
5. [Configuring Energy Saving Settings \(page 24\)](#)
6. [Configuring Scheduler \(page 25\)](#)
7. [Setting Thermostat Clock \(page 26\)](#)
8. [Testing Thermostat \(page 27\)](#)

NOTE: When the thermostat is connected to a network, the equipment and the energy saving settings configured on the thermostat will be overridden by settings configured online.

Pairing Thermostat with HVAC Controller

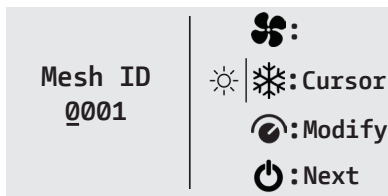


The thermostat and wireless controller must be paired during installation. The thermostat will search for the closest controller to it and display the unique controller ID.

THE WIRELESS CONTROLLER MUST BE LINKED TO A THERMOSTAT IN THE SAME ROOM. ONLY INSTALL ONE ROOM AT A TIME.

1. Verify HVAC controller ID found by thermostat matches ID listed on HVAC controller in the same room.
2. Touch  button to pair thermostat with HVAC Controller displayed on screen. If HVAC Controller ID displayed on screen is incorrect, touch the  button to reject it.
3. Touch  button to advance to next menu or  button to return to previous step.

Setting MESH ID



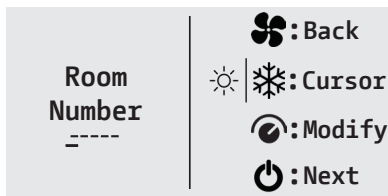
For networked installations, a unique MESH ID is associated to each Online Connection Kit and is provided by your technical support agent during the installation training (also labeled on device).

For installations using a single Online Connection Kit, each thermostat may be linked to MESH ID 0001. For installations requiring multiple Online Connection Kits, each thermostat should be linked to the MESH ID of the closest Online Connection Kit.

1. Touch ☀️❄️ button to advance to next digit.
2. Rotate the temperature knob to increase or decrease value.
3. Touch 🔌 button to advance to next menu.

NOTE: The MESH ID on the thermostat and Online Connection Kit must match for online visibility on thermostatsolutions.com. To change the MESH IDs, please contact Verdant Technical Support.

Entering Room Number



Enter the room number by changing the characters on screen. Available characters include digits 0-9 and letters A-F. To distinguish between two or more thermostats in the same unit, enter as follows:

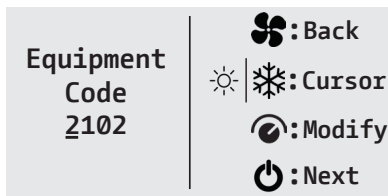
Thermostat 1: 00100

Thermostat 2: 0100A

1. Touch button to advance to next digit.
2. Rotate the temperature knob to increase or decrease value.
3. Touch button to advance to next menu.

ENTERING ROOM NUMBER CORRECTLY IS CRUCIAL FOR PROPER OPERATION OF THERMOSTATS WITH ONLINE MANAGEMENT.

Configuring Equipment Settings



Enter the equipment code by changing the digits on screen. Refer to the table below.

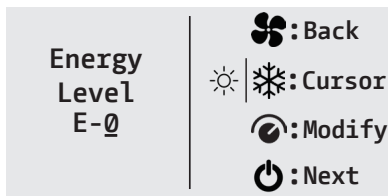
1. Touch button to advance to next digit.
2. Rotate the temperature knob to increase or decrease value.
3. Touch button to advance to the next menu.

Digit Value	Digit #1 Compressor Type	Digit #2 Electric Heat	Digit #3 Reversing Valve	Digit #4 Fan Speed
0	No Compressor	No Electric Heat	O/B Contact is energized to cool*	N/A
1	Heat Pump	Electric Heat*	O/B Contact is energized to heat	One Fan Speed*
2	Air Conditioner*	N/A	N/A	Two Fan Speeds
3	N/A			Three Fan Speeds

NOTE: * indicates default setting

IMPORTANT: INSERTING INCORRECT EQUIPMENT CODE MAY CAUSE HVAC UNIT TO NOT OPERATE AS EXPECTED.

Configuring Energy Saving Settings



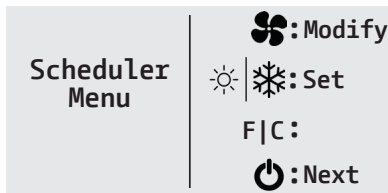
1. Rotate the temperature knob to increase or decrease value.
2. Touch  button to advance to next menu.

Preset	Energy Savings Presets
E-0*	Energy Savings Off - No Temperature Setback
E-1	Lowest Energy Savings
E-2	Lower Energy Savings
E-3	Standard Energy Savings
E-4	Higher Energy Savings
E-5	Highest Energy Savings

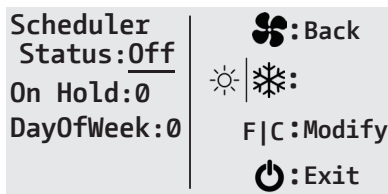
NOTE: * indicates default setting

Configuring Scheduler

NOTE: Firmware version 1130 and higher is required for scheduler feature.



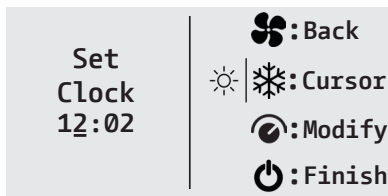
1. Touch ☀️❄️ button. The scheduler status will appear.
2. Rotate the temperature knob to set the scheduler **On** or **Off**.



NOTE: By default, the scheduler is enabled (**On**). For hospitality applications or applications where the scheduler will not be used, change to **Off**.

3. Touch ⏻ button to advance to next menu.

Setting Thermostat Clock



Set thermostat clock to current time in 24h format.

1. Touch ☀|❄ button to advance to next digit.
2. Rotate the temperature knob to increase or decrease value.
3. Touch ⏻ button to save settings and exit configuration menu.

Thermostat configuration (setup) is now complete.

SETTING CORRECT TIME IS CRUCIAL FOR PROPER OPERATION OF THERMOSTAT. TIME UPDATES AUTOMATICALLY IF CONNECTED TO ONLINE CONNECTION KIT.

Testing Thermostat

Following thermostat configuration, test if the thermostat is controlling the HVAC unit.

1. Ensure thermostat is powered.
2. Rotate the temperature knob counterclockwise to change temperature set point below current room temperature to confirm thermostat initiates cooling.
3. Rotate the temperature knob clockwise to change temperature set point above current room temperature to confirm thermostat initiates heating.
4. Change fan speed by touching  button to test if thermostat is controlling fan speed.

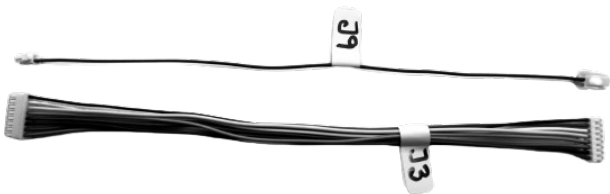
Unit-Specific Applications

GE Units

Installing HVAC Controller for GE Units

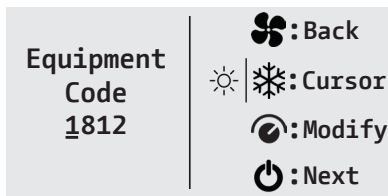
This procedure is **only required** if the unit's Make Up Air will be driven by the thermostat.

1. Power Off HVAC Unit.
2. Mount HVAC Controller inside of HVAC unit.
3. Insert GE specific wire harnesses into corresponding J3 (controls) and J9 (occupancy) ports of HVAC controller.
4. Insert other end of J3 harness into unit's External Thermostat Connector terminal and J9 harness into unit's CDC terminal.
5. Insert jumper onto J10 port pins on controller.



GE Wire Harnesses

Configuring Equipment Settings for GE V12 Units



Enter equipment code 1812 by changing digits on screen.

1. Touch  button to advance to next digit.
2. Rotate the temperature knob to increase or decrease value to 1812.
3. Touch  button to advance to next menu.

Configuring Occupancy Relay Output for GE Units

If unit's Make Up Air will be controlled by thermostat, occupancy output must be set to Normally Open (NO).

Equipment codes for GE V12 and other GE units:

Model	Equipment Code
V12 with or without Make Up Air	1812
PTAC with or without Make Up Air	2102
PTHP with or without Make Up Air	1112
VTAC A/C with or without Make Up Air	2102
VTAC HP with or without Make Up Air	1112

Refer to [Appendix 2 - Equipment Codes \(page 107\)](#) for proper wiring.

WHEN ROOM IS OCCUPIED MAKE UP AIR SHOULD WORK AS WELL. FOR FRESH AIR TO OPERATE ACCORDING TO GE'S SPECIFICATIONS, THE OCCUPANCY OUTPUT RELAY MUST BE SET AS NORMALLY OPEN (NO).

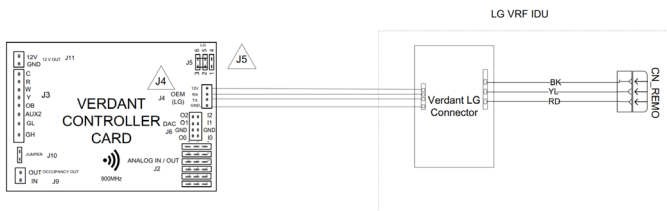
IMPORTANT: ENTERING THE WRONG EQUIPMENT CODE MAY CAUSE THE HVAC UNIT TO NOT OPERATE AS EXPECTED.

LG Units

Installing HVAC Controller for LG VRF Units

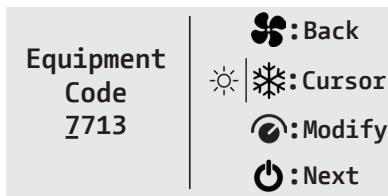
1. Power Off HVAC Unit.
2. Mount HVAC Controller inside of HVAC unit.
3. Connect one end of wire harness to J4 port on HVAC Controller.
4. Insert one jumper into function selection pins 2 and 3 of J5. Insert another jumper in pins 5 and 6.
5. Connect other end of wire harness to LG unit CN-REMO port.

Wiring Diagram Verdant LG - HVAC Controller



THE HVAC CONTROLLER ANTENNA MUST BE FACING THERMOSTAT AND MUST NOT BE TOUCHING OR ENCLOSED BY ANY METAL COMPONENTS IN THE HVAC UNIT.

Configuring Equipment Settings for LG VRF & Inverter PTAC Units



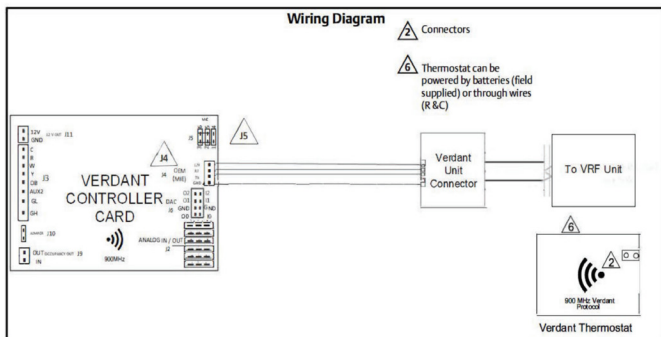
If LG Inverter PTACs are being controlled, enter equipment code 7713 by changing digits on screen. If LG VRFs are being controlled, enter equipment code 7723.

1. Touch ☀️❄️ button to advance to next digit.
2. Rotate the temperature knob to increase or decrease value to 7713 | 7723.
3. Touch 🔌 button to advance to next menu.

Carrier Units

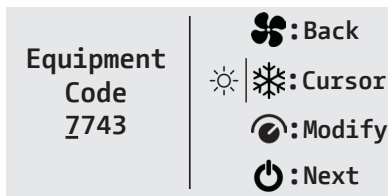
Installing HVAC Controller for Carrier VRF Units

1. Power Off HVAC Unit.
2. Mount HVAC Controller inside of HVAC unit.
3. Connect one end of wire harness to J4 port on HVAC Controller.
4. Insert one jumper into function selection pins 2 and 3 of J5. Insert another jumper in pins 5 and 6.
5. Connect other end of wire harness to Carrier VRF unit.



THE HVAC CONTROLLER ANTENNA MUST BE FACING THERMOSTAT AND MUST NOT BE TOUCHING OR ENCLOSED BY ANY METAL COMPONENTS IN THE HVAC UNIT.

Configuring Equipment Settings for Carrier VRF Units



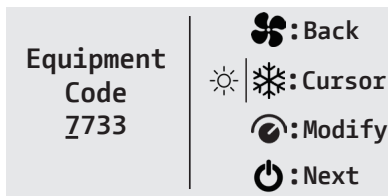
Enter equipment code 7743 by changing digits on screen.

1. Touch ☀|❄ button to advance to next digit.
2. Rotate the temperature knob to increase or decrease value to 7743.
3. Touch ⏻ button to advance to next menu.

Compatibility

Indoor Unit Type	Model
Outside Air	40VMA
Compact 4-Way Cassette	40VMC
Medium Static Ducted	40VMM
Vertical AHU	40VMV
Multiport Distribution Controller	40VMD
Floor Console	40VMR
4-Way Cassette	40VMF
Under-ceiling IDU	40VMU
High Static Ducted	40VMH
Highwall IDU	40VMW
One-Way Compact Cassette	40VMI
Low Static Ducted	40VML
Reheat Unit	40VMZ

Configuring Equipment Settings for Toshiba VRF Units



Enter equipment code 7733 by changing digits on screen.

1. Touch ☀|❄ button to advance to next digit.
2. Rotate the temperature knob to increase or decrease value to 7733.
3. Touch ⏻ button to advance to next menu.

Compatibility

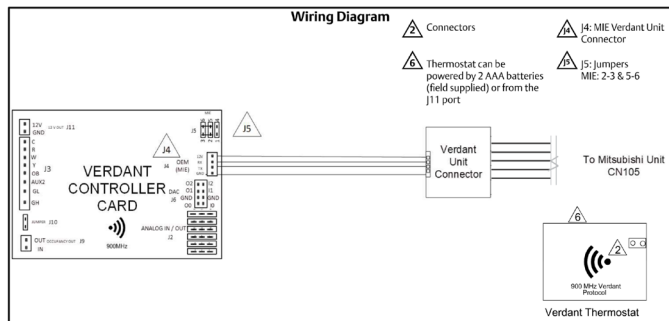
Communication Type	TU2C-Link (U Series)	TCC-Link (non-U Series)
Outdoor Unit	MM*-AP***	MMY-MHP*** MCY-MHP*** MMY-MAP***
Indoor Unit	MM*-UP***	MMY-AP*** MCY-MAP***

Mitsubishi Units

Installing HVAC Controller for Mitsubishi Electric Trane HVAC US VRF Units

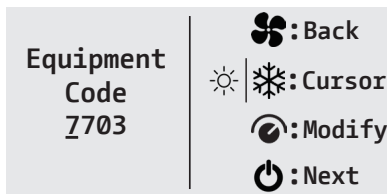
1. Power Off HVAC Unit.
2. Mount HVAC Controller inside of HVAC unit.
3. Connect one end of wire harness to J4 port on HVAC Controller.
4. Insert one jumper into function selection pins 2 and 3 of J5. Insert another jumper in pins 5 and 6.
5. Connect other end of wire harness to METUS unit CN105 port.

NOTE: If the space is unoccupied and humidity levels are high, the MIE Thermostat is able to manage the humidity levels using the Dry Mode of the indoor unit.



THE HVAC CONTROLLER ANTENNA MUST BE FACING THERMOSTAT AND MUST NOT BE TOUCHING OR ENCLOSED BY ANY METAL COMPONENTS IN THE HVAC UNIT.

Configuring Equipment Settings for Mitsubishi/Trane VRF Units



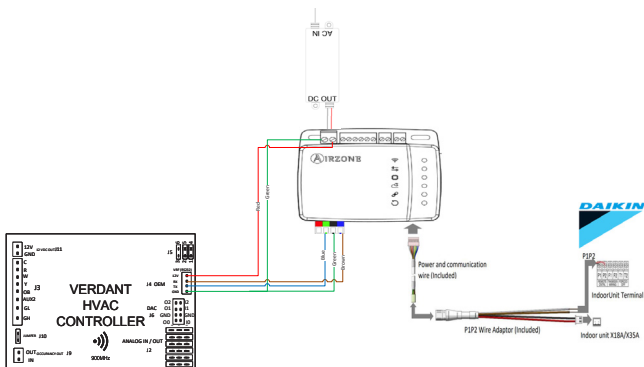
Enter equipment code 7703 by changing digits on screen.

1. Touch  button to advance to next digit.
2. Rotate the temperature knob to increase or decrease value to 7703.
3. Touch  button to advance to next menu.

Airzone (Daikin) Units

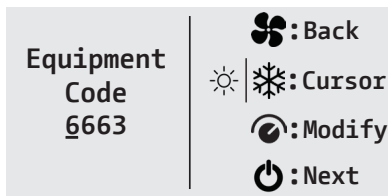
Installing HVAC Controller for Airzone (Daikin) VRF Units

1. Power Off HVAC Unit.
2. Mount HVAC Controller inside of HVAC unit.
3. Connect one end of wire harness to J4 port on HVAC Controller.
4. Insert one jumper into function selection pins 1 and 2 of J5. Insert another jumper in pins 4 and 5.
5. Connect other end of wire harness to Airzone (Daikin) adaptor.



THE HVAC CONTROLLER ANTENNA MUST BE FACING THERMOSTAT AND MUST NOT BE TOUCHING OR ENCLOSED BY ANY METAL COMPONENTS IN THE HVAC UNIT.

Configuring Equipment Settings for Airzone (Daikin) VRF Units



Enter equipment code 6663 by changing digits on screen.

1. Touch button to advance to next digit.
2. Rotate the temperature knob to increase or decrease value to 6663.
3. Touch button to advance to next menu.

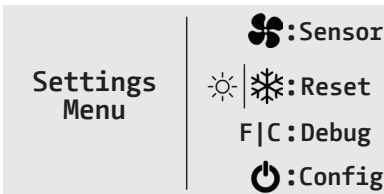
Checking VRF Error Codes

To check the error code on the thermostat, follow the steps below:

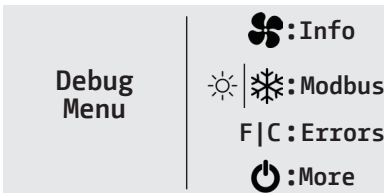
1. Ensure thermostat is powered.



2. Touch and hold  and  buttons simultaneously for three (3) seconds. The settings menu will appear.



3. Touch **F | C** button to access debug menu.



4. Touch ☼|⚙ button to select Modbus. The communication error and AC error codes will be displayed.

COMM ERROR:0000

AC ERRCODE:0000

Fan High:100

Fan Med:67

Fan Low:33

To identify the error, refer to the table below:

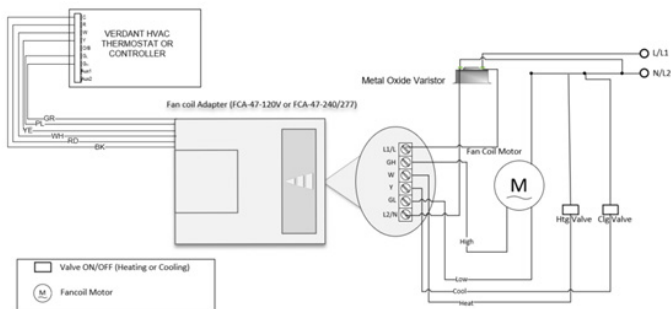
Error Code	Description
0000	No error.
0FFE	No bytes received from AC, either bad connection with AC or AC not replying at all. This communication error occurs after two (2) minutes of no response from AC.
FXXX	Connection failed due to packet error. The received packets are encoded in the error code (0xF000 received_pages). Range is (0xF000 - 0xFFFFE). 0xFFFF = no error. Any other value is an error.
0333	No reply received for three consecutive heartbeats from AC.

Voltage Adaptor

Installing Voltage Adaptor (Motor less than 1/10HP)

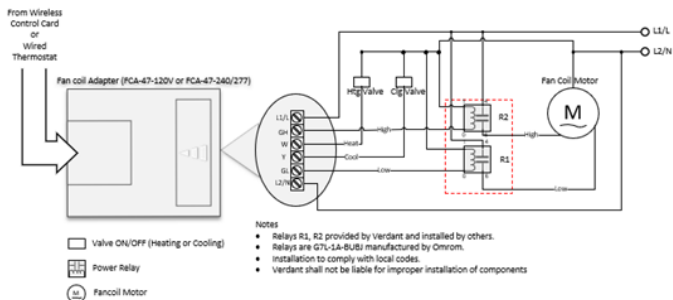
Fan Coil Adaptors (FCA) are used in applications where the Fan Coil Unit (FCU) in the controlled space has components, such as the fan motor or heating / cooling valves, that use a line voltage or a voltage exceeding 30VAC.

Where the Horsepower Rating of the Motor is less than 1/10HP, the solution will include the FCA and the Metal Oxide Varistor used as control or compensation elements to provide optimal operating conditions and protect against excessive transient voltages.



Installing Voltage Adaptor (Motor Greater than 1/10HP)

Where the Horsepower Rating of the Motor is greater than 1/10HP, the solution will include the FCA and two relays.



Combined DC Applications

The thermostat can provide 0-10 VDC modulating (analogue) output for valves and fans in the following applications:

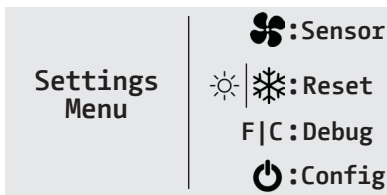
- Combine 24 VAC on/off (digital) with 0-10 VDC modulating (analogue) output
- Entirely 0-10 VDC modulating (analogue) output

Scheduler

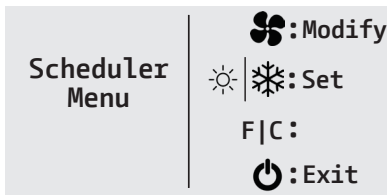
Enabling/Disabling Scheduler

NOTE: Firmware version 1130 and higher is required for scheduler feature.

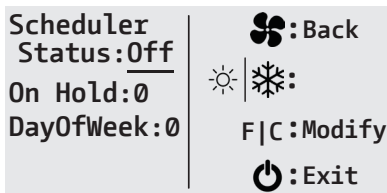
1. Ensure thermostat is powered and operational.
2. Touch and hold  and  buttons simultaneously for three (3) seconds. The settings menu will appear.



3. Touch **F | C** button to access debug menu.
4. Touch  button to access more menu items.
5. Touch **F | C** button to access scheduler menu.



6. Touch ☀|❄ button. The scheduler status will appear.



7. Rotate the temperature knob to set the scheduler **On** or **Off**.

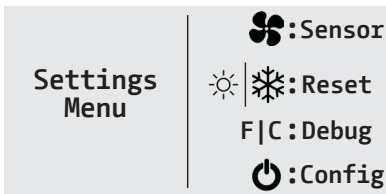
NOTE: By default, the scheduler is enabled (**On**). For hospitality applications or applications where the scheduler will not be used, change to **Off**.

8. Touch ⏻ button to exit menu.

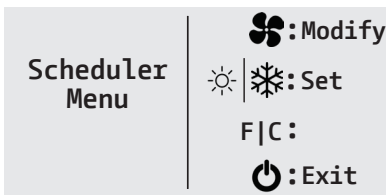
Modifying Scheduler Events

NOTE: Firmware version 1130 and higher is required for scheduler feature.

1. Ensure thermostat is powered and operational.
2. Touch and hold  and  buttons simultaneously for three (3) seconds. The settings menu will appear.

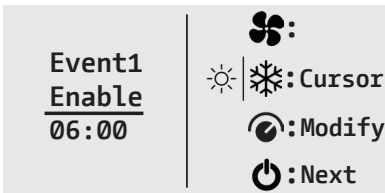


3. Touch **F|C** button to access debug menu.
4. Touch  button to access more menu items.
5. Touch **F|C** button to access scheduler menu.

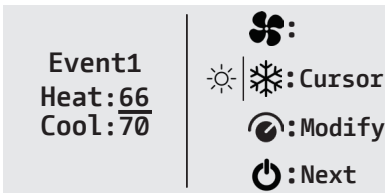


6. Touch  button to configure scheduler events.

7. Rotate the temperature knob to enable or disable an event.



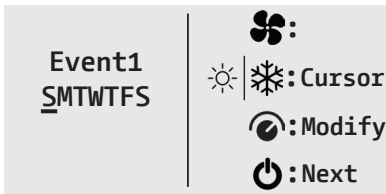
8. Touch ☀️❄️ button to advance to set start time.
9. Set start time in 24h format. Rotate the temperature knob to increase or decrease value. Touch ☀️❄️ button to advance to next digit.
10. Touch 🔌 button to advance to next screen.



11. Set the heat set point in degrees (°F). Rotate the temperature knob to increase or decrease value.
12. Touch ☀️❄️ button to advance to cool set point.
13. Set the cool set point degrees (°F). Rotate the temperature knob to increase or decrease value.

THE HEAT SET POINT MUST BE LOWER THAN THE COOL SET POINT.

14. Touch  button to advance to next screen.



15. Set which days of the week the event should be enabled. Rotate the temperature knob to enabled or disable. Touch | button to advance to next digit (day).
16. Touch  button to advance to next event.
17. Repeat steps 7-16 until all desired events are scheduled.

NOTE: The previous event will continue until the start time of the following event. For example, if Event2 begins at 18:00, Event1 will be active until 18:00.

NOTE: By default, six (6) events are available for programming. Additional events can be enabled using Verdant EI™.

18. Touch  button to exit the scheduler menu.

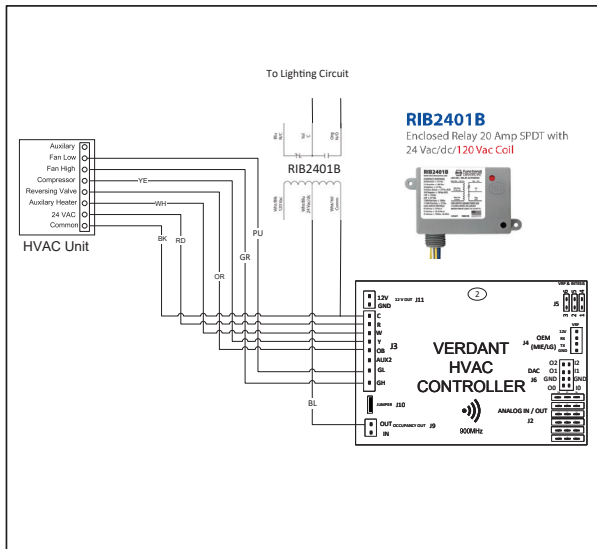
Integrations

Lighting

The thermostat uses built-in infrared motion sensors in conjunction with a wired occupancy sensor to scan a room for occupancy. An auxiliary output provides a binary signal according to real-time occupancy status in the room.

The auxiliary output is wired to a 24 VAC relay installed on the lighting circuit; closing the circuit when the room is occupied, and automatically shutting off power to the circuit after occupancy is no longer detected.

A RIB2401B relay is recommended.



Optional Accessories

Remote Occupancy Sensor

To expand the occupancy detection area, install a remote occupancy sensor.

1. Select appropriate installation location.

OCCUPANCY SENSORS SHOULD FACE THE DESIRED OCCUPANCY DETECTION AREA.

2. With faceplate removed, place sensor on wall in installation location and mark location for drilling holes for two (2) mounting screws.
3. Drill two (2) 3/16" holes in wall and insert (2) two wall anchors (supplied).
4. Use two (2) screws (supplied) to securely mount sensor to the wall.
5. Insert one (1) AAA battery (not supplied) into compartment (wireless sensors only).

Remote Temperature Sensor

If the thermostat is installed in a poor temperature sensing location, install a remote temperature sensor to sense temperature in a different location.

1. Select appropriate installation location.

DO NOT INSTALL TEMPERATURE SENSORS NEAR WINDOWS OR DOOR VENTS, ON AN EXTERNAL WALL, ABOVE OR BELOW SUPPLY VENTS, OR OTHER LESS OCCUPIED AREAS.

2. With faceplate removed, place sensor on wall in installation location and mark location for drilling holes for two (2) mounting screws.
3. Drill two (2) 3/16" holes in wall and insert two (2) wall anchors (supplied).
4. Use two (2) screws (supplied) to securely mount sensor to the wall.
5. Insert one (1) AAA battery (not supplied) into compartment (wireless sensors only).

Door/Window Sensor

To disable heating and cooling when a door or window is open, install a door/window sensor at each door and window.

1. Select appropriate installation location.
2. With faceplate removed, place sensor on wall in installation location and mark location for drilling holes for two (2) mounting screws.
3. Drill two (2) 3/16" holes in wall and insert two (2) wall anchors (supplied).
4. Use two (2) screws (supplied) to securely mount sensor to the wall.
5. Mount the switch to the door/window frame using screws.
6. Insert one (1) AAA battery (not supplied) into compartment (wireless sensors only).

Configuring & Managing Accessories

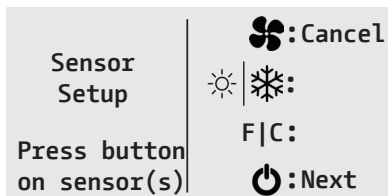
Accessing Sensor Setup Menu

1. Touch and hold  and  buttons simultaneously for three (3) seconds. The settings menu will appear.
2. Touch  button to access sensor setup menu.



3. Touch  button to add a sensor.

Activating a Sensor

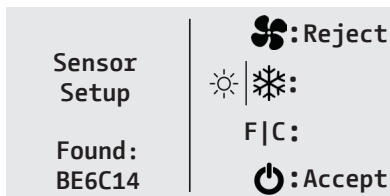


1. Remove faceplate from sensor(s) to be paired.
2. Insert two (2) AAA batteries (not supplied) into each sensor.
3. Press and hold the button inside sensor(s) for two-three (2-3) seconds to make discoverable.

NOTE: The sensor(s) blink green when discoverable for five (5) minutes after pressing the button inside the device. If the pairing process has not been completed within five (5) minutes, push button inside sensor again.

4. Touch button to initiate pairing. This may take up to 30 seconds.

Discovering an Active Sensor



After up to 30 seconds of searching, the thermostat will display the first sensor discovered in the pairing process. Ensure that the unique device number displayed on screen matches the sensor(s) to be paired in the room.

1. Touch  button to pair discovered sensor displayed on screen.
2. Repeat this process as necessary for additional sensors.

NOTE: Up to eight (8) of each sensor type can be paired to a thermostat.

Configuring Functionality of Sensor

Sensor Cfg. 996C14	 :OCC
OCC:Enable	  :DWS
DWS:N/O	F C : TMP
TMP:Disable	 :Next

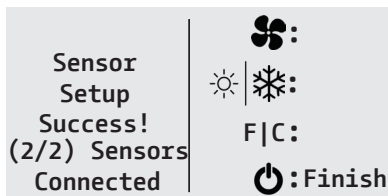
The thermostat allows the user to choose the functionality of the sensor. Use the table below to configure the desired functionality.

1. Touch the corresponding button to select sensor functionality.
2. Touch  button to advance to next menu.

Sensor Function	Options		
OCC (Occupancy Sensor)	Enable*	Disable	
DWS (Door Switch)	N/O (Normal Open)	N/C (Normally Closed)	Disable*
TMP (Temperature Sensor)	Master (Temperature reading from sensor overrides thermostat)	Average (Average of temperature readings from all sensors and thermostat)	Disable*

NOTE: * indicates default setting

Completing Sensor Setup



The thermostat will display the number of sensors successfully paired with the HVAC Controller. Ensure the number of sensor successfully paired is no more or less than the desired number of sensors installed in the room.

1. Ensure the number of sensor successfully paired matches the desired number of sensors installed in the room.
2. Touch  button to exit sensor setup menu.

Verifying Sensor Connection Status and Unlinking Sensors

NOTE: Thermostat and HVAC unit must be powered.

1. Touch and hold  and  buttons simultaneously for three (3) seconds. The settings menu will appear.
2. Touch  button to access sensor setup menu.
3. Touch  button to manage sensors.
4. Touch  button to view the first sensor's unique device ID and current status. Continue cycling through each sensor until the desired sensor is displayed.
5. Touch  button to delete a sensor and then YES to confirm.

NOTE: The thermostat configuration screen has a 30-second time-out. If no action is taken within 30 seconds, the thermostat will exit configuration settings.

Custom Energy Savings Settings

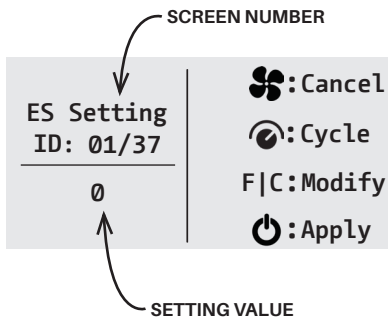
If you do not want to use one of the energy saving presets detailed in [Appendix 1 - Energy Saving Presets \(page 105\)](#), you can enter custom energy savings settings.

Accessing Custom Energy Savings Settings

1. Ensure thermostat is powered.
2. Touch and hold  and  buttons simultaneously for three (3) seconds. The settings menu will appear.
3. Touch **F|C** button to navigate to the debug menu.
4. Touch  button to access more menu items.
5. Touch **F|C** button to access the custom energy saving settings.

NOTE: The thermostat configuration screen has a 30-second time-out. If no action is taken within 30 seconds, the thermostat will exit configuration settings.

Using Thermostat Settings Screens



1. Rotate the temperature knob to change setting value (see [page 64](#) - [page 100](#) for more info and minimum/maximum values).
2. Touch **F|C** button to advance to next setting screen.
3. Touch  button to return to previous screen.
4. Touch  button to save and exit thermostat settings.

Demand Response

Demand Response (DR) is a resource for balancing power supply and demand by allowing consumers options to reduce or shift their energy consumption away from peak periods.

NOTE: DR requires firmware 1130 or later.

How it works

- Enroll: Tenant or Property owner opt in to receive DR events
- Integration with Aggregators: DR aggregators linked to the property's utility company integrate with APIs allowing automatic transmission of DR events to thermostats
- Active DR Event Indicator: Thermostats display a distinctive icon alerting tenants and guests a DR event has been sent
- Opt-Out Option: Tenants and Guests may opt out of DR events by adjusting the setpoint

01 - FAN CONTROL MODE

ES Setting ID: 01/37 000	 :Cancel  :Cycle F C:Modify  :Apply
--	--

Default value: 000 Range: 000-001	Select Fan Control Mode: 000: AUTOMATIC - fan runs only when there is a demand for heating or air conditioning. 001: MANUAL - guest can select automatic or continuous fan mode.
--	--

02 - 1ST STAGE DIFFERENTIAL HEAT

ES Setting ID: 02/37	 :Cancel
005	 :Cycle
	F C:Modify
	 :Apply

Default value: 005 (0.5°F)	Select number of degrees (°F) thermostat has to sense between automatic changeover temperature for heat and room temperature before a call for 1st stage heating is initiated.
Range: 002-030 (0.2-3.0°F)	

03 - 2ND STAGE DIFFERENTIAL HEAT

ES Setting
ID: 03/37

010

:Cancel

:Cycle

F|C:Modify

:Apply

Default value: 010 (1.0°F)

Range: 010-020 (1.0-2.0°F)

Select difference (°F) between 1st stage heating and 2nd stage heating initiation.

This also applies as the 3rd and 4th stage differential on top of the 2nd when there are more than 2 stages.

04 - 1ST STAGE DIFFERENTIAL COOL

ES Setting ID: 04/37	 :Cancel
005	 :Cycle
	F C:Modify
	 :Apply

Default value: 005 (0.5°F)	Select number of degrees (°F) thermostat has to sense between automatic changeover temperature for cool and room temperature before a call for 1st stage cooling is initiated.
Range: 002-030 (0.2-3.0°F)	

05 - INCIDENTAL OCCUPANCY THRESHOLD

ES Setting ID: 05/37	 :Cancel
000	 :Cycle
	F C:Modify
	 :Apply

Default value: 000 Range: 000-060	Select minimum period of time (in minutes) for which occupancy needs to be detected to enter guest occupancy mode. When occupancy is detected, thermostat will switch to occupied mode for a duration of Incidental Occupancy Threshold selected. If occupancy is detected for a period of time shorter than the Incidental Occupancy Threshold selected, the thermostat will automatically revert to unoccupied mode at the end of the Incidental Occupancy Threshold period and continue to observe energy saving functions that were in effect before the room became occupied. This setting allows ignoring incidental room visits. If occupancy is detected for a period of time longer than the Incidental Occupancy Threshold selected, the thermostat will enter the guest occupancy mode. When the thermostat is in the guest occupancy mode, it will revert to unoccupied mode and initiate the setback temperature only when occupancy is not detected for the duration of the setback delay (Heat or Cool) period.
---	---

06 - NIGHT OCCUPANCY THRESHOLD

ES Setting ID: 06/37	 :Cancel
001	 :Cycle
	F C:Modify
	 :Apply

Default value: 001 Range: 000-060	Select minimum period of time (in minutes) for which occupancy needs to be detected to consider the room occupied during the Night Occupancy period. When occupancy is detected during Night Occupancy Period for longer than the Night Occupancy Threshold selected, the thermostat will instantaneously switch to occupied mode. If occupancy is detected for a period of time shorter than the Night Occupancy Threshold selected, the thermostat will automatically revert to unoccupied mode and continue to observe energy saving functions that were in effect before the room became occupied. If occupancy is detected for a period of time longer than the Night Occupancy Threshold selected, the thermostat will disable the occupancy sensor and consider the room occupied until the end of the Night Occupancy period. This feature ensures energy saving functions that may affect guest comfort will not come into effect during the Night Occupancy period.
---	---

07 - FORCED 2ND STAGE HEATING

ES Setting
ID: 07/37

030

:Cancel

:Cycle

F|C:Modify

:Apply

Default value: 030

Range: 000-060

Select number of minutes 1st stage heating will run before 2nd stage heating is automatically initiated if the guest set point is not reached and the 2nd stage heating is not initiated through differential settings.

This feature allows automatically turning on 2nd stage heating to avoid excessive compressor use.

Set to **000** to disable the feature.

This also applies as the 3rd and 4th stage differential on top of the 2nd when there are more than 2 stages.

08 - NIGHT OCCUPANCY START

ES Setting ID: 08/37	 :Cancel
018	 :Cycle
	F C:Modify
	 :Apply

Default value: 018 Range: 000-023	Select the start time (24-hour clock) for Night Occupancy. If occupancy is detected for a period of time longer than the Night Occupancy Threshold during Night Occupancy period, the thermostat will disable the occupancy sensor and consider the room occupied until the end of the Night Occupancy period. This feature ensures that energy saving functions that may affect guest comfort will not come into effect during the Night Occupancy period if room was occupied for a period of time longer than Night Occupancy Threshold.
---	--

09 - NIGHT OCCUPANCY END

ES Setting ID: 09/37	 :Cancel
012	 :Cycle
	F C:Modify
	 :Apply

Default value: 012	Select the end time (24-hour clock) for Night Occupancy.
Range: 000-023	The time of day the Night Occupancy ends and the thermostat switches back to the room sensing settings chosen in the other occupancy modes.

10 - TEMPERATURE RECOVERY TIME

ES Setting ID: 10/37	 :Cancel
000	 :Cycle
	F C:Modify
	 :Apply

Default value: 000	Select the maximum time (in minutes) allowed for a HVAC unit to attain temperature as defined by Heat and Cool Recovery Temperature;
Range: 000-060	Temperature Recovery Time selected and the actual temperature recovery ability of the HVAC unit are used to calculate setback temperatures. Calculated setback temperatures maximize energy savings and at the same time ensure a comfortable room temperature (defined as Heat and Cool Recovery Temperature) will be restored within the selected Temperature Recovery Time.
	Set the Temperature Recovery Time to 000 to disable temperature recovery. When temperature recovery is disabled, thermostat will use the Minimum and Maximum Setback Temperatures as setback set points.

11 - RECOVERY TEMPERATURE HEAT

ES Setting
ID: 11/37

070

:Cancel

:Cycle

F|C:Modify

:Apply

Default value: 070 (70°F)

Range: 062-082 (62-82°F)

Select room temperature in °F that a HVAC unit will have to attain within the selected Temperature Recovery Time when there is a need for heating.

If recovery is disabled (Temperature Recovery Time set to **000**) or if setback temperatures have not yet been calculated, the Recovery Temperature - Heat value will be used as the setback temperature for heating.

12 - TEMPERATURE SETBACK DELAY

ES Setting ID: 12/37	 :Cancel
000	 :Cycle
	F C:Modify
	 :Apply

Default value: 000 Range: 000-120	Select the time delay (in minutes) for which the room that is in the guest occupancy mode needs to be unoccupied before the temperature setback is initiated. This feature prevents initiating temperature setback prematurely while the guest is still in the room but in an area where occupancy cannot be detected by the occupancy sensor. Set the Temperature Setback Delay - Heat to 000 to disable the setback in the heat mode. Set to 000 to disable EMS.
---	---

13 - MINIMUM SETBACK TEMPERATURE

ES Setting ID: 13/37	 :Cancel
067	 :Cycle
	F C:Modify
	 :Apply

Default value: 067 (67°F)	Select Minimum Setback Temperature in °F.
Range: 052-072 (52-72°F)	Setback temperature is calculated by measuring HVAC unit's ability to attain Recovery Temperature - Heat within Temperature Recovery Time. If recovery is disabled (Temperature Recovery Time is set to 000) or if setback temperatures have not yet been calculated, the Recovery Temperature - Heat value will be used as the setback temperature for heating. If calculated setback temperature for heating is lower than Minimum Setback Temperature, then the Minimum Setback Temperature will be used as setback temperature for heating. This feature allows defining the minimum temperature in a room when room is unoccupied and the thermostat is in the setback mode.

14 - MAXIMUM SETBACK TEMPERATURE

ES Setting
ID: 14/37

072

:Cancel

:Cycle

F|C:Modify

:Apply

Default value: 072 (72°F)

Range: 072-092 (72-92°F)

Select the Maximum Setback Temperature in °F.

Setback temperature is calculated by measuring HVAC unit's ability to attain Recovery Temperature - Cool within Temperature Recovery Time.

If recovery is disabled (Temperature Recovery Time is set to **000**) or if setback temperatures have not yet been calculated, the Maximum Setback Temperature value will be used as the setback temperature for cooling.

If calculated setback temperature for air conditioning is higher than Maximum Setback Temperature, then the Maximum Setback Temperature will be used as setback temperature for air conditioning.

This feature allows defining the maximum temperature in a room when room is unoccupied and the thermostat is in the setback mode.

15 - RECOVERY TEMPERATURE COOL

ES Setting ID: 15/37	 :Cancel
071	 :Cycle
	F C:Modify
	 :Apply

Default value: 071 (71°F)	Select the room temperature in °F that a HVAC unit will have to attain within the selected Temperature Recovery Time when there is a need for air conditioning.
Range: 062-082 (62-82°F)	

16 - MINIMUM SET POINT

ES Setting ID: 16/37	 :Cancel
	 :Cycle
064	F C:Modify
	 :Apply

Default value: 064 (64°F)	Select the minimum set point in °F that a guest can select.
Range: 064-084 (64-84°F)	

17 - MAXIMUM SET POINT

ES Setting ID: 17/37	 :Cancel
082	 :Cycle
	F C:Modify
	 :Apply

Default value: 082 (82°F)	Select the maximum set point in °F that a guest can select.
Range: 060-082 (60-82°F)	

18 - TEMPERATURE CONTROL MODE

ES Setting ID: 18/37	 :Cancel
001	 :Cycle
	F C:Modify
	 :Apply

Default value: 001	Select Temperature Control Mode:
Range: 000-001	000: MANUAL - Allows users to select HEAT only or COOL only temperature control mode to maintain the room temperature.
	001: AUTOMATIC - Thermostat automatically turns on heating or air conditioning to maintain the room temperature at the selected temperature set point.

19 - AUTO CHANGEOVER SET POINT OFFSET

ES Setting ID: 19/37 001	 : Cancel  : Cycle F C: Modify  : Apply
---	--

Default value: 001 (1°F) Range: 000-004 (0-4°F)	Select the difference in °F between the guest-selected set point and the heat and the cool set point when the thermostat is in the automatic temperature control mode. This value plus the 1st stage differential defined in settings 02 and 04, defines the temperature at which the thermostat would automatically change heating/cooling modes. This feature allows adjusting the deadband between the heat and the cool set points in automatic changeover mode to avoid the system from bouncing back and forth between heating and cooling under normal operating conditions.
---	--

20 - USE SETBACK SET POINTS

ES Setting ID: 20/37	 : Cancel
000	 : Cycle
	F C: Modify
	 : Apply

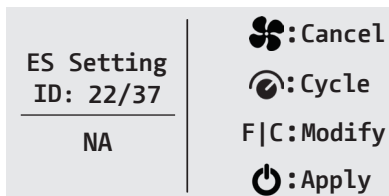
Default value: 000	Select Setback Set Point Mode:
Range: 000-001	000: OFF - When room is unoccupied and the thermostat is in the setback mode or turned off, it will NOT maintain the temperature between heat and cool setback set points.
	001: ON - When room is unoccupied and the thermostat is in the setback mode or turned off, it will maintain the temperature between heat and cool setback set points.

21- AUTO-RESTORE

ES Setting ID: 21/37 000	 :Cancel  :Cycle F C:Modify  :Apply
---	--

Default value: 000 Range: 000-001	Select Auto-Restore Mode: 000: OFF - When guest enters the room, the thermostat will be turned off - it will not automatically restore the most recent guest settings. 001: ON - When guest enters the room, the thermostat will automatically restore the most recent guest settings.
--	--

22 - PLACEHOLDER SCREEN



NOTE: For future use.

23 - SETPOINT OVERSHOOT

ES Setting ID: 23/37	 :Cancel
	 :Cycle
006	F C:Modify
	 :Apply

Default value: 006 (0.6°F)	Select the number of degrees (°F) of overshoot above or below the setpoint on the thermostat before the thermostat stops the call for cooling or heating.
Range: 004-020 (0.4-2°F)	

24 - AUTOMATIC HUMIDITY CONTROL

ES Setting
ID: 24/37

000

:Cancel

:Cycle

F|C:Modify

:Apply

Default value: 000

Range: 000-001

Select Automatic Humidity Control Mode:

000: Disable Automatic Humidity Control

001: Enable Automatic Humidity Control

When Automatic Humidity Control is enabled, thermostat will turn on air conditioning in an unoccupied room when humidity raises above 60% and room temperature is above 72°F until either room humidity is below 55% or room temperature is below 72°F.

This setting is active only on thermostats with enabled humidity features. Changing this setting on a non-humidity thermostat will have no effect on thermostat operation.

Humidity features can be enabled on compatible thermostats via online management.

25 - 2ND STAGE COOL DIFFERENTIAL

ES Setting ID: 25/37	 :Cancel
	 :Cycle
010	F C:Modify
	 :Apply

Default value: 010 (1°F)	Select the °F differential required to trigger 2nd stage cooling (if applicable).
Range: 005-030 (0.5-3°F)	This also applies as the 3rd and 4th stage differential on top of the 2nd when there are more than 2 stages.

26 - SMART SETBACK

ES Setting
ID: 26/37

000

:Cancel

:Cycle

F|C:Modify

:Apply

Default value: 000

Range: 000-001

Select Smart Setback Mode:

000: Disable Smart Setback

001: Enable Smart Setback

Smart Setback reduces the excessive heating or cooling that may occur when occupants set their thermostats to setpoints outside of the norm. Occupant setpoint that is greater than Cool Setback or less than Heat Setback will be respected during setbacks to save energy.

27 - HUMIDITY CONTROL THRESHOLD

ES Setting ID: 27/37	 :Cancel
060	 :Cycle
	F C:Modify
	 :Apply

Default value: 060 (60°F)	Select the relative humidity level that automatic humidity control will attempt to control in conjunction with the humidity cut-off temperature.
Range: 055-070 (55-70°F)	

28 - HUMIDITY CUTOFF TEMPERATURE

ES Setting
ID: 28/37

072

:Cancel

:Cycle

F|C:Modify

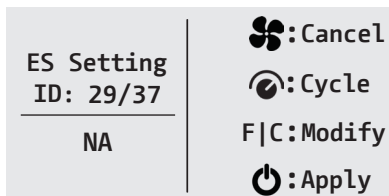
:Apply

Default value: 072 (72°F)

Range: 065-075 (65-75°F)

Select the temperature in °F at which humidity control will shut off.

29- PLACEHOLDER SCREEN



NOTE: For future use.

30- ENERGY MANAGEMENT ON/OFF

ES Setting ID: 30/37	 :Cancel
	 :Cycle
000	F C:Modify
	 :Apply

Default value: 000	Select Energy Management Mode:
Range: 000-001	000: Energy Management disabled
	001: Energy Management enabled

31- DOOR/WINDOW SHUT OFF DELAY

ES Setting ID: 31/37	 :Cancel
002	 :Cycle
	F C:Modify
	 :Apply

Default value: 002	Select the time delay (in minutes) before the thermostat disables air conditioning when a door or window sensor has been installed.
Range: 001-060	

32 - AUTO FAN SPEED 1ST STAGE DIFFERENTIAL

ES Setting
ID: 32/37

002

:Cancel

:Cycle

F|C:Modify

:Apply

Default value: 002 (2°F)

Range: 002-008 (2-8°F)

Select the °F differential between Low Fan and 2nd stage fan (Medium or High) when Auto-Fan Speed is selected.

33 - AUTO FAN SPEED 2ND STAGE DIFFERENTIAL

ES Setting
ID: 33/37

004

:Cancel

:Cycle

F|C:Modify

:Apply

Default value: 004 (4°F)

Range: 002-010 (2-10°F)

Select the °F differential between Medium and High Fan when Auto-Fan Speed is selected (only active if three fan speeds are available).

34 - TEMPERATURE CALIBRATION

ES Setting ID: 34/37	 :Cancel
	 :Cycle
000	F C:Modify
	 :Apply

Default value: 000 (0°F)	Calibrate the temperature display.
Range: -050-050 (-5-5°F)	

35 - AUTO MODE TYPE

ES Setting ID: 35/37	 :Cancel
001	 :Cycle
	F C:Modify
	 :Apply

Default value: 001 Range: 001-002	Select Auto Mode Type: 001: Standard Auto Mode - The thermostat will apply the deadband on the guest setpoint and control temperature with the guest setpoint as the median. 002: Changeover Auto Mode - The thermostat will apply the deadband as a changeover limit where the deadband is crossed triggering a change in heating or cooling mode.
--	---

36 - HUMIDITY CONTROL OCCUPIED ROOM

ES Setting
ID: 36/37

000

:Cancel

:Cycle

F|C:Modify

:Apply

Default value: 000

Range: 000-001

Select Humidity Control Mode:

000: Humidity Control OFF - The thermostat will disable humidity control when the room is occupied.

001: Humidity Control ON - The thermostat will enable humidity control even when the room is occupied.

37 - HEAT EQUIPMENT LOCKOUT

ES Setting
ID: 37/37

000

:Cancel

:Cycle

F|C:Modify

:Apply

Default value: 000

Range: 000-002

Select Heat Equipment Lockout Mode:

000: Compressor lockout - The thermostat will only allow electric heat.

001: Electric heat lockout - The thermostat will only allow compressor heat.

002: Equipment lockout is disabled - The thermostat will enable both compressor and electric heat.

Thermostat Maintenance

Replacing Thermostat Batteries

The low battery indicator is displayed on thermostat screen when it is necessary to replace batteries.



Under normal operating conditions, new brand-name alkaline batteries last for approximately 18 months. Replace batteries every 16 months to ensure continuous thermostat operation.

1. Remove thermostat cover.
2. Replace two (2) AAA batteries (not supplied) in thermostat battery compartment.
3. Re-affix thermostat cover.

NOTE: Thermostat maintains all previous configuration settings in non-volatile memory. There is no need to configure the thermostat again after battery replacement.

Troubleshooting

Screen Icons



Thermostat has lost communication with HVAC Controller

Solution 1: Ensure HVAC Controller is powered, then rotate temperature knob and wait 15 seconds. If successful, the no-link icon will disappear.

Solution 2: Cut power to HVAC unit, and remove cover to access HVAC Controller. Verify HVAC controller antenna is not touching any metal components and has not sustained any water damage.



Thermostat has lost communication with a sensor

Solution: Change batteries in sensor. Re-pairing will automatically take place once new batteries have been installed.

Error Icons



Cooling disabled due to open door or window

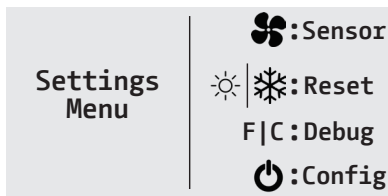
Solution: Close windows and or/doors



Low battery

Solution: Install new batteries.

Restoring Factory Settings



For reported errors or configuration issues, restore devices to default parameters and re-pair.

Thermostat Factory Reset

1. Ensure thermostat is powered.
2. Touch and hold  and  buttons simultaneously for three (3) seconds. The settings menu will appear.
3. Touch  button to initiate master reset.

HVAC Controller Factory Reset

1. If there is a button of HVAC Controller, press and hold for three (3) seconds.
2. If there is no button, connect pin 1 to pin 3 using a wire jumper and power cycle HVAC Controller. Remove jumper once complete.

Remote Sensor Factory Reset

1. Remove faceplate from sensor.
2. Press and hold the button until green LED light blinks.

NOTE: Contact Verdant Technical Support if the issues are not resolved.

Appendices

Appendix 1 - Energy Saving Presets

* Bolded values below indicate the factory default profile

	Level 0*	Level 1	Level 2	Level 3	Level 4	Level 5
Fan Control Mode	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
1st Stage Differential Heat	005	005	005	005	005	005
2nd Stage Differential Heat	010	010	010	020	020	020
1st Stage Differential Cool	005	005	005	005	005	005
Incidental Occupancy Threshold	000	005	005	005	005	005
Night Occupancy Threshold	001	001	001	001	001	001
Forced 2nd Stage Heating	030	030	030	030	030	030
Night Occupancy Start	018	019	020	021	022	023
Night Occupancy End	012	011	010	009	008	007
Temperature Recovery Time	000	015	020	025	030	000
Recovery Temperature Heat	070	069	068	067	066	065
Temperature Setback Delay	000	030	025	020	015	010
Minimum Setback Temperature	067	066	065	064	063	062
Maximum Setback Temperature	072	074	076	078	080	082
Recovery Temperature Cool	071	072	073	074	075	076
Minimum Set Point	064	064	065	066	067	068
Maximum Set Point	082	082	080	078	076	074
Temperature Control Mode	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
Auto Changeover Set Point Offset	001	001	001	001	001	001

	Level 0*	Level 1	Level 2	Level 3	Level 4	Level 5
Use Setback Set Points	OFF	ON	ON	ON	ON	ON
Auto Restore	OFF	ON	ON	ON	ON	ON
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Setpoint Overshoot	006	006	006	006	006	006
Automatic Humidity Control	OFF	OFF	OFF	OFF	OFF	OFF
2nd Stage Cool Differential	010	010	010	020	020	020
Smart Setback	OFF	OFF	OFF	OFF	OFF	OFF
Humidity Control Threshold	060	060	060	060	060	060
Humidity Cutoff Temperature	072	072	072	072	072	072
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Energy Management On/Off	OFF	ON	ON	ON	ON	ON
Door/Window Shut Off Delay	002	002	002	002	002	002
Auto Fan Speed 1st Stage Differential	002	002	002	002	002	002
Auto Fan Speed 2nd Stage Differential	004	004	004	004	004	004
Temperature Calibration	000	000	000	000	000	000
Auto Mode Type	STD	STD	STD	STD	STD	STD
Humidity Control Occupied Room	OFF	OFF	OFF	OFF	OFF	OFF
Heat Equipment Lockout	000	000	000	000	000	000

Appendix 2 - Equipment Codes

	Outputs						
EQPT Code	J3 port						J9 port
Color	White	Yellow	Orange	Brown	Purple	Green	Blue
0101	W1	X	X	X	X	GH	OCC
0102	W1	X	X	X	GL	GH	OCC
0103	W1	X	GM	X	GL	GH	OCC
0302	GH	WCW	WCCW	X	GL	X	OCC
0303	GH	WCW	WCCW	X	GL	GM	OCC
1001	X	Y1	O	X	X	GH	OCC
1002	X	Y1	O	X	GL	GH	OCC
1011	X	Y1	B	X	X	GH	OCC
1012	X	Y1	B	X	GL	GH	OCC
1101	W1	Y1	O	X	X	GH	OCC
1102	W1	Y1	O	X	GL	GH	OCC
1111	W1	Y1	B	X	X	GH	OCC
1112	W1	Y1	B	X	GL	GH	OCC
1201	WAUX	Y1	O	X	X	GH	OCC
1202	WAUX	Y1	O	X	GL	GH	OCC
1211	WAUX	Y1	B	X	X	GH	OCC
1212	WAUX	Y1	B	X	GL	GH	OCC
2001	X	Y1	X	X	X	GH	OCC
2002	X	Y1	X	X	GL	GH	OCC
2003	X	Y1	GM	X	GL	GH	OCC
2100	W1	Y1	X	X	X	X	OCC

	Outputs						
EQPT Code	J3 port						J9 port
Color	White	Yellow	Orange	Brown	Purple	Green	Blue
2101	W1	Y1	X	X	X	GH	OCC
2102	W1	Y1	X	X	GL	GH	OCC
2103	W1	Y1	GM	X	GL	GH	OCC
2502	Y1	W1	W2	X	GL	GH	OCC
5501	Y1	Y2	W1	X	W2	GH	OCC
5502	Y1	Y2	W1	X	W2	GH	OCC

	Outputs							Analog output Connections (J6 Port)			
EQPT Code	J3 port						J9 port	O0	GND	O1	O2
Color	White	Yellow	Orange	Brown	Purple	Green	Blue	White	Black	Yellow	Green
2106	W1	Y1	X	X	X	X	OCC	X	GND	X	Analog Fan
4403	X	X	GM	X	GL	GH	OCC	Analog Heat	GND	Analog Cool	X
4406	X	X	X	X	X	X	OCC	Analog Heat	GND	Analog Cool	Analog Fan

Appendix 3 - Energy Saving Settings Index

Setting Index	Description	Min	Max	Default
01	Fan Control Mode	000	001	000
02	1st Stage Differential Heat	002	030	005
03	2nd Stage Differential Heat	010	020	010
04	1st Stage Differential Cool	002	030	005
05	Incidental Occupancy Threshold	000	060	000
06	Night Occupancy Threshold	000	060	001
07	Forced 2nd Stage Heating	000	060	030
08	Night Occupancy Start	000	023	018
09	Night Occupancy End	000	023	012
10	Temperature Recovery Time	000	060	000
11	Recovery Temperature Heat	062	082	070
12	Temperature Setback Delay	000	120	000
13	Minimum Setback Temperature	052	072	067
14	Maximum Setback Temperature	072	092	072
15	Recovery Temperature Cool	062	082	071
16	Minimum Set Point	064	084	064
17	Maximum Set Point	060	082	082
18	Temperature Control Mode	000	001	001
19	Auto Changeover Set Point Offset	000	004	001
20	Use Setback Set Points	000	001	000
21	Auto Restore	000	001	000
22	N/A	N/A	N/A	N/A

Setting Index	Description	Min	Max	Default
23	Setpoint Overshoot	004	020	006
24	Automatic Humidity Control	000	001	000
25	2nd Stage Cool Differential	005	030	010
26	Smart Setback	000	001	000
27	Humidity Control Threshold	055	070	060
28	Humidity Cutoff Temperature	065	075	072
29	N/A	N/A	N/A	N/A
30	Energy Management On/Off	000	001	000
31	Door/Window Shut Off Delay	001	060	002
32	Auto Fan Speed 1st Stage Differential	002	008	002
33	Auto Fan Speed 2nd Stage Differential	002	010	004
34	Temperature Calibration	-050	050	000
35	Auto Mode Type	001	002	001
36	Humidity Control Occupied Room	000	001	000
37	Heat Equipment Lockout	000	002	000

Appendix 4 - Glossary

"1st Stage Differential - Cool" - the temperature that the thermostat has to sense between the automatic changeover temperature for cool and the room temperature before a call for the 1st stage cooling is initiated;

"1st Stage Differential - Heat" - the temperature that the thermostat has to sense between the automatic changeover temperature for heat and the room temperature before a call for the 1st stage heating is initiated;

"2nd Stage Differential - Heat" - difference between 1st stage heating temperature and room temperature before the 2nd stage heating is initiated;

"Auto Changeover Set Point Offset" - the difference between the guest-selected set point and the heat and cool changeover temperatures;

"Auto Restore Off" - thermostat will NOT restore the most recent guest settings and will remain turned off when new occupancy is detected;

"Auto Restore On" - thermostat will restore the most recent guest settings when new occupancy is detected;

"Automatic Fan Control Mode" - fan runs only when there is a demand for heating or cooling;

"Automatic Temperature Changeover" - thermostat automatically activates heating or cooling to maintain the desired room temperature;

"External Thermostat" (Class 2) mode - HVAC unit setting allowing it to be controlled by a remote thermostat;

"Forced 2nd Stage Heating" - number of minutes 1st stage heating will run before 2nd stage heating is automatically initiated if the guest set point is not reached and the 2nd stage heating is not initiated through differential settings;

"Guest Occupancy" - occupancy longer than the Incidental Occupancy Threshold;

"Incidental Occupancy" - occupancy shorter than the Incidental Occupancy Threshold;

"Incidental Occupancy Threshold" - the minimum period of time (in minutes) for which occupancy needs to be detected in order to enter the "Guest Occupancy" mode;

"Manual Fan Control Mode" - guest can select between automatic or continuous fan operation;

"Maximum Set point" - maximum temperature that a guest can request;

"Minimum Set point" - minimum temperature that a guest can request;

"Maximum Setback Temperature" - the highest room temperature allowed when thermostat is in the setback mode;

"Minimum Setback Temperature" - the lowest room temperature allowed when thermostat is in the setback mode;

"Night Occupancy Mode" - thermostat status during which setback mode is disabled if occupancy longer than Night Occupancy Threshold is detected within the "Night Occupancy" period;

"Night Occupancy Period" - the period of time during the day during which the Night Occupancy mode can be activated if occupancy longer than the Night Occupancy Threshold is detected;

"Night Occupancy Threshold" - the minimum period of time during the Night Occupancy period for which occupancy needs to be detected in order to enter the Night Occupancy mode;

"Recovery Temperature" - the room temperature that needs to be restored within the "Temperature Recovery Time";

"Setback Set points Off" - thermostat will NOT maintain setback temperatures when room is unoccupied;

"Setback Set points On" - thermostat will maintain setback temperatures when room is unoccupied;

"Temperature Recovery Time" - the maximum period of time allowed for restoring the "Recovery Temperature";

"Temperature Setback" - thermostat maintains setback temperatures and not the guest set point temperature in order to save energy;

"Temperature Setback Delay" - the length of time for which the room that is in the guest occupancy mode needs to be unoccupied before the temperature setback is initiated

Warranty

Refer to www.verdant.co/verdant-warranty.

Hereby, We, Copeland Comfort Control LP (Verdant Environmental Technologies Inc.) declares that the radio equipment type ZX-HV-868 is in compliance with the Directive 2014/53/EU.

The minimum distance between the user and/or any bystander and the radiating structure of the transmitter is 20cm.

The full text of the EU declaration of conformity is available at the following internet address: www.verdant.copeland.com

This device may be operated in all member states of the EU.

Observe national and local regulations where the device is used.

Technical Specifications

Product Type		Thermostat	
SKU(s) (includes networked thermostats (-XMF))	ZX-TW ZX-TW-GEA ZX-TW-HVCC ZX-TW-HCR ZX-RSW ZX-RSW-MIE ZX-RSW-LG ZX-RSW-AZA-D ZX-WU	ZX-NWU ZX-TW-LIT ZX-TW-LIT-AOS ZX-TW-DLI-DKAA-1- XMF ZX-TW-DLI-DKAA-2- XMF ZX-TW-DLI-ONIT-XMF ZX-TW-LIT-DLI-DKAA- 1-XMF ZX-TW-LIT-DLI-DKAA- 2-XMF ZX-TW-LIT-DLI-ONIT- XMF	ZX-TW-868 ZX-RSW-868 ZX-WU-868 ZX-NWU-868
Wireless Operating Frequency	902-928 MHz (NA)		863-870 MHz (EU)
Max RF Output Power (ERP)	-5.68 dBm		
Case Dimensions	3.00" x 4.73" x 1.32" (76 mm x 120 mm x 34 mm)		
Screen Dimensions	1.88" x 0.94" (48 mm x 24 mm)		
Operating Voltage	2 x 1.5 VDC AAA Alkaline Non-rechargeable Batteries (Not Supplied) 24 VAC or 12 VDC		
Control Outputs (24 VAC) (1.5 A maximum per terminal, 2.5 A maximum all terminals combined)	N/A		
Power Supply Outlet	N/A		
Occupancy Sensor Beam Width	±47° (94°)		
Temperature Accuracy	±1°F		
Enclosure Material	ABS+PC (TAIRILOY® AC3100 (Formosa Chemicals & Fibre Corporation))		
Ambient Operating Temp	32°F -105°F (0 - 41°C)		
Internet Connectivity	N/A		
FCC ID	XEYZXWU		
IC	8410A-ZXWU		

Product Type	HVAC Controller		Gateway	
SKU(s)	ZX-LV-868 ZX-HV-868	ZX-LV ZX-HV	ZX-OL-U-868	ZX-OL-U
Wireless Operating Frequency	863-870 MHz (EU)	902-928 MHz (NA)	N/A	
Case Dimensions	4.08" x 2.76" x 1.02" 104 mm x 70 mm x 26 mm		4.72" x 3.15" x 1.18" 120 mm x 80 mm x 30 mm	
Operating Voltage	24 VAC (20-30 VAC) / 12 VDC (9-15 VDC) 110-277 VAC		12 VDC 1.5 A	
Control Outputs (24 VAC/12 VDC) (1.5 A maximum per terminal, 2.5 A maximum all terminals combined)	Common (J3-C) / Analog In 1 (J2)		N/A	
	24 VAC (J3-R) / Analog In 2 (J2)			
	Heat (J3-W) / Analog In 3 (J2)			
	Compressor (J3-Y) / Analog Out 1 (J2)			
	Reversing Valve (J3-OB) / Analog Out 2 (J2)			
	Auxiliary (J3-AUX2) / Analog Out 3 (J2)			
	Fan Low (J3-GL) / AUX1 In (J9)			
	Fan High (J3-GH) / AUX1 Out (J9)			
	N/A / RS485A			
	N/A / RS485B			
	N/A / 12 VDC (J11)			
	N/A / GND (J11)			
Power Supply Outlet	12 VDC @ 0.05 A (Max)		N/A	
Occupancy Sensor Beam Width	N/A		N/A	
Temperature Accuracy	±1°F		N/A	
Enclosure Material	ABS+PC (TAIRILOY® AC3100 (Formosa Chemicals & Fibre Corporation))		Extruded Aluminum	
Ambient Operating Temp	32°F -105°F (0 - 41°C)		32°F -105°F (0 - 41°C)	
Internet Connectivity	N/A		100M/1000M Base-T Ethernet	
FCC ID	XEY-ZX-LV		N/A	
IC	8410A-ZX-LV		N/A	

Product Type	Root Node		Sensors	
SKU(s)	ZX-RN-868	ZX-RN	ZX-AOS-868 ZX-DWS-868 ZX-TSW-868	ZX-AOS ZX-DWS ZX-TSW
Wireless Operating Frequency	863-870 MHz (EU)	902-928 MHz (NA)	863-870 MHz (EU)	902-928 MHz (NA)
Case Dimensions	2.4" x 1.54" x 0.78" 46 mm x 61 mm x 19 mm		1.82" x 2.4" x 0.74" 46 mm x 61 mm x 19 mm	
Operating Voltage	+5 VDC (nom.)		2 x 1.5 VDC AAA Alkaline Non-rechargeable Batteries - Not Supplied	
Control Outputs (24 VAC) (1.5 A maximum per terminal, 2.5 A maximum all terminals combined)	N/A		N/A	
Power Supply Outlet	N/A		N/A	
Occupancy Sensor Beam Width	N/A		±47° (94°)	
Temperature Accuracy	±1°F		±1°F	
Enclosure Material	ABS (AF312C(LG CHEM))		ABS+PC (TAIRILOY® AC3100 (Formosa Chemicals & Fibre Corporation))	
Ambient Operating Temp	32°F -105°F (0 - 41°C)		32°F -105°F (0 - 41°C)	
Internet Connectivity	N/A		N/A	
FCC ID	XEY-ZX-RN		XEYZ9RF	
IC	8410A-ZXRN		8410A-Z9RF	



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 UNDESIRE OPERATION.

THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS 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.

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 radio électrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotroperayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

COVERED BY ONE OR MORE OF THE FOLLOWING PATENTS. US PATENTS: 8,369,994; 8,141,791; 7,918,406; 7,232,075; 7,185,825; 7,156,318; 7,152,806; 7,145,110; 7,050,026; 7,028,912; 6,902,117; 6,789,739; 6,786,421; 6,619,555; 6,581,846; 6,578,770; 7,838,803; 7,841,542; D556,061; D518,744; RE40,437; CANADIAN PATENTS: 2,633,113; 2,633,200; OTHER PATENTS PENDING.

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TECHNICAL SUPPORT: verdant.support@copeland.com 1-877-318-1823