UbiquiSTAT ™

Commercial BACnet Thermostat

The UbiqiSTAT is a feature rich, multifunction touchscreen thermostat which provides for control of a wide range of HVAC applications. This series provides a large color display, with simple to understand control of conventional and heat pump equipment as well as modulating operation.
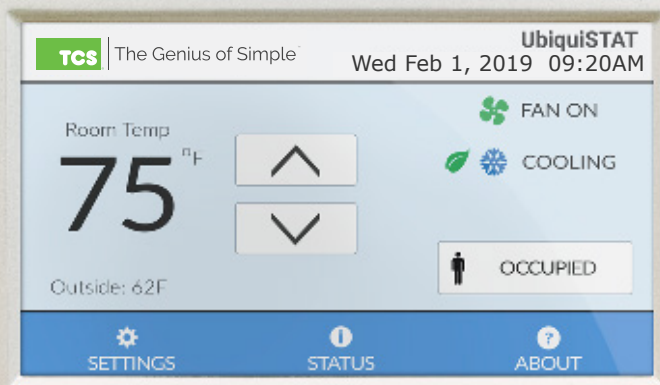
Models:

US4010/US4110 - Single-Stage RTU / Zoning Thermostat
US4020/US4120 - Multi-Stage RTU Thermostat
US4040/US4140 - Advanced RTU Thermostat
US4050/US4150 - Advanced Application Thermostat

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Manual Key

The following symbols are used throughout this document. Their meanings are as follows:

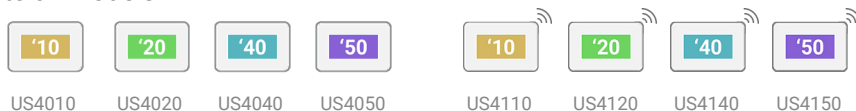⚠ **Caution:**   Requires special attention.

☞ **Note:**   Something you should know.

Model Specific Icons: Denotes features available only on specific models. If no icons are shown, the feature applies to all models.

'10	'20	'40	'50		'10	'20	'40	'50
US4010	US4020	US4040	US4050		US4110	US4120	US4140	US4150

Features

- **Powerful touchscreen user interface**
  - Internal BACnet explorer
  - Quick start wizard
  - System test screen for rapid commissioning
  - Highly detailed status reporting and diagnostics
  - Service status indication with custom messaging
  - Calibration of temperature inputs
  - 4.3" color touchscreen
- **Selectable BACnet or TCSbus communication**
  - BACnet MS/TP or BACnet/IP
  - BACnet BTL Listed (B-ASC)
  - Backward compatible with existing TCSbus networks
  - All inputs/outputs fully commandable via network
- **Full-featured BACnet scheduling (SCHED-I-B)**
  - 5 Heat/Cool setpoint groups
- **Includes all TCS SZ Series thermostat features**
  - Includes many additional features and enhancements
- **4 temperature inputs (1 built-in, 3 remote)**
  - Outdoor, discharge, remote room
  - Configurable weighted averaging of built-in and remote room
- **Conventional or heat pump control**
- **Discharge setpoint reset on modulating heat/cool control**

- **Configurable Smart Recovery™**
- **Configurable P+I relay stage anticipator**
- **Setpoint setback based on DI**
- **Network upgradeable firmware**
- **Built-in equipment protection delays and sequencing**
- **Programmable fan control**
  - Auto/on/cool/recirculation modes for occupied and unoccupied
  - Adjustable recirculation
  - Fan proving with automatic retries
- **User management controls**
  - Occupancy override enable/disable
  - Setpoint adjust range limit
  - Optional access code locks out on-screen programming
- **Outdoor air heating and cooling lockouts**
- **Discharge air protection limits**
- **Fahrenheit or Celsius temperature display**
- **External time clock input/output**
- **Adjustable delay on power up and occupancy**
- **Stand-alone or network operation**
- **Backup & Restore of all settings (DM-BR-B)**

Model Specific Features:

Feature / Model	4010/4110	4020/4120	4040/4140	4050/4150
Stage Configuration: Total stages # [Heat # / Cool # / Configurable # (heat or cool]	2 [1/0/1]	6 [2/2/2]	6 [2/2/2]	6 [2/2/2]
Analog Inputs / Outputs (0-20mA or 4-20mA)	0/2	0/0	1/1	2/2
Mixed air on T1 (when using built-in temp sensor)	-	-	✔	✔

Applications

Common application set:

- **Built-in application programming with simple configuration**
- **Advanced fan control**
  - Recirculation mode to meet minimum fresh air requirements
- **Demand response setback**
- **Door status response setback**

Model specific application set:

Feature / Model	4010/4110	4020/4120	4040/4140	4050/4150
Conventional staging: heat / cool / selectable	1/0/1	2/2/2	2/2/2	2/2/2
Heat pump control: compressors / aux heat • Emergency heat • Cold climate automatic auxiliary heat switch-over w/compressor lockout	1/1	2/2	2/2	2/2
Analog Inputs				
CO_2 control	-	-	✔	✔
Dehumidification monitoring	-	-	-	-
Pressure monitoring	-	-	-	-
General purpose monitoring	-	-	✔	✔
Analog outputs				
Hot and chilled water valve control	-	-	-	✔
Modulating zone damper control w/reheat	✔	-	-	-
Economizer control	-	-	✔	✔
Demand ventilation (CO_2 control)	-	-	✔	✔
Digital or Analog heat/cool changeover control	✔	-	-	✔
Hot deck / Cold deck zone control	✔	-	-	✔
Mixing valve control	-	-	-	✔

Product Description

The UbiquiSTAT product family is a feature rich, multi-purpose BACnet thermostat with a touchscreen interface. It can be configured for conventional heating and cooling, heat pump, or modulating control applications, and has a number of heat/cool setpoint groups, and a number of output stages (specific to UbiquiSTAT model). It contains many standard features from the TCS SZ series thermostats, as well as enhancements and new features. The UbiquiSTAT provides two networking options: TCSbus and BACnet.

1   Mounting and Assembly

The UbiquiSTAT™ is designed for wall mounting using two #6 sheet metal screws, either over a 2"x4" or 4"x4" junction box, or directly to the wall. For best results, the thermostat should be mounted on an interior wall that represents a normal room environment, at a height of approximately 48" from the floor. For best temperature measurement accuracy, avoid areas exposed to direct sunlight, unusual heat or cool sources, open doors and windows, unventilated locations, and hot or cold air from diffusers. If using a remote room sensor, the sensor should be mounted in the same manner. The thermostat should be mounted in an area which is accessible for adjusting settings.

The UbiquiSTAT consists of a base containing wiring terminal blocks and relays and a front cover containing touchscreen and all other circuitry. Each base and cover pair is factory calibrated and serialized together. To remove the UbiquiSTAT™ cover, insert a small plastic pry tool or flathead screwdriver between the front cover and base on the bottom of the thermostat. Run the tool along the seam until the halves separate.

The following process ensures correct assembly when mating the front cover with the base. Check that no wiring interferes with the cover, and no bare wires are exposed before assembly.

STEP 1 ORIENT THE COVER
MATCH THE ORIENTATION OF THE INTERNAL CONNECTORS.
COVER
BASE
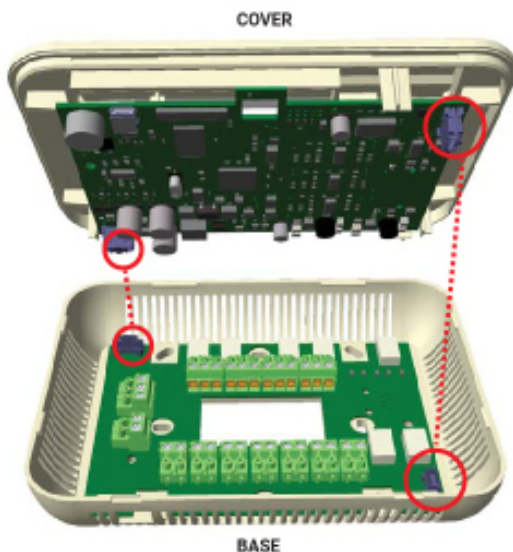
STEP 2 SEAT COVER ONTO BASE
⚠ WITHOUT SNAPPING THEM TOGETHER, GENTLY SEAT THE FRONT COVER ON THE BASE, FEELING FOR ALIGNMENT OF ALL FOUR (4) SIDES.

STEP 3 SNAP COVER INTO BASE
USING BOTH HANDS, EVENLY PRESS ALL FOUR (4) CORNERS SIMULTANEOUSLY.
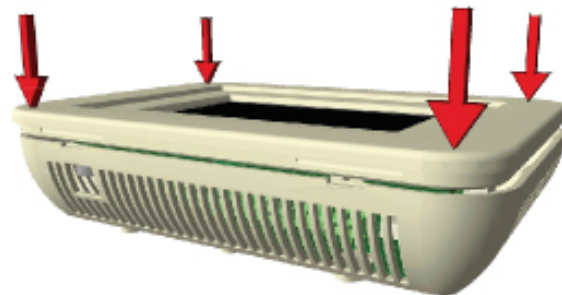
⚠ **IF THE SCREEN DOES NOT LIGHT UP**
NOTE: 1.) CHECK THAT THERE IS POWER TO THE BASE
2.) THE INTERNAL CONNECTORS MAY NOT BE FULLY ENGAGED; REMOVED COVER AND REASSEMBLE.

⚠ **IF THE SCREEN IS LIT UP BUT RELAYS OR ANALOG INPUTS/OUTPUTS ARE NOT WORKING**
NOTE: 1.) THE LOWER RIGHT CONNECTOR MAY NOT BE FULLY ENGAGED
2.) REMOVE COVER AND REASSEMBLE.

2   Wiring

The UbiquiSTAT™ uses standard terminal designations for wiring. See figures 1a - 1d for the wiring diagram corresponding to your UbiquiSTAT™ model.

2.1   REMOTE TEMPERATURE SENSOR WIRING

There are three remote sensor inputs (T1, T2, T3) with a range of -40F to 160F. These can be used for remote room sensing, discharge air temperature, outdoor air temperature or mixed air temperature. See sections 3.1 and 3.2 for information on configuring temperature inputs.

Use 18 AWG shielded twisted-pair wire grounded at the sensor mounting location. Sensor wiring runs of 250 feet are attainable if properly shielded wire is used and the installation environment is free of electrical noise. Sensor wire should be kept at least five feet away from line voltage wiring. The UbiquiSTAT™ accepts 2-wire platinum 1000 Ohm RTD temperature sensors. TCS provides a wide assortment of temperature sensors. Please consult tcsbasys.com for a full product listing.

☞   When using remote sensors, the calibration may need to be adjusted. See section 4.5.2.2 for more information.

2.2   REMOTE ANALOG SENSOR WIRING

Depending on UbiquiSTAT model, there are uo to two current sensing inputs (AI1, AI2) configurable as 0-20mA or 4-20mA for connecting remote sensors. These inputs can be used for any current-based sensors such as CO_2 and humidity.

Use 18 AWG shielded twisted-pair wire grounded at the sensor mounting location. Sensor wire should be kept at least five feet away from line voltage wiring. TCS provides a wide assortment of 4-20mA sensors and transmitters. Please see tcsbasys.com for a full product listing.

2.3   POWERING THE UBIQUISTAT™

⚠   The UbiquiSTAT is powered from 24 VAC +15% / -5% and draws up to 10 VA.

Caution: Do not connect to 120 VAC. Doing so **will** damage the UbiquiSTAT.

The UbiquiSTAT may be powered from the unit transformer, however if the UbiquiSTAT is wired for communications, a dedicated power source (transformer) will avoid any potential ground loop issues between equipment transformers. Several thermostats may be powered from the same dedicated transformer, provided that the transformer has sufficient power and the power polarity is maintained.

⚠   *Caution:* When multiple TCS Basys Controls devices are using a single transformer, the polarity of the power wiring must be maintained or damage will occur. All TCS devices are half-wave rectified and have common return paths.

☞   When the UbiquiSTAT™ is used as a stand-alone thermostat without communications, the equipment transformer may be used to power it. To do this, install a jumper between the "R" and "+24" terminals. The "24-" terminal must then be connected to the common side of the equipment transformer.
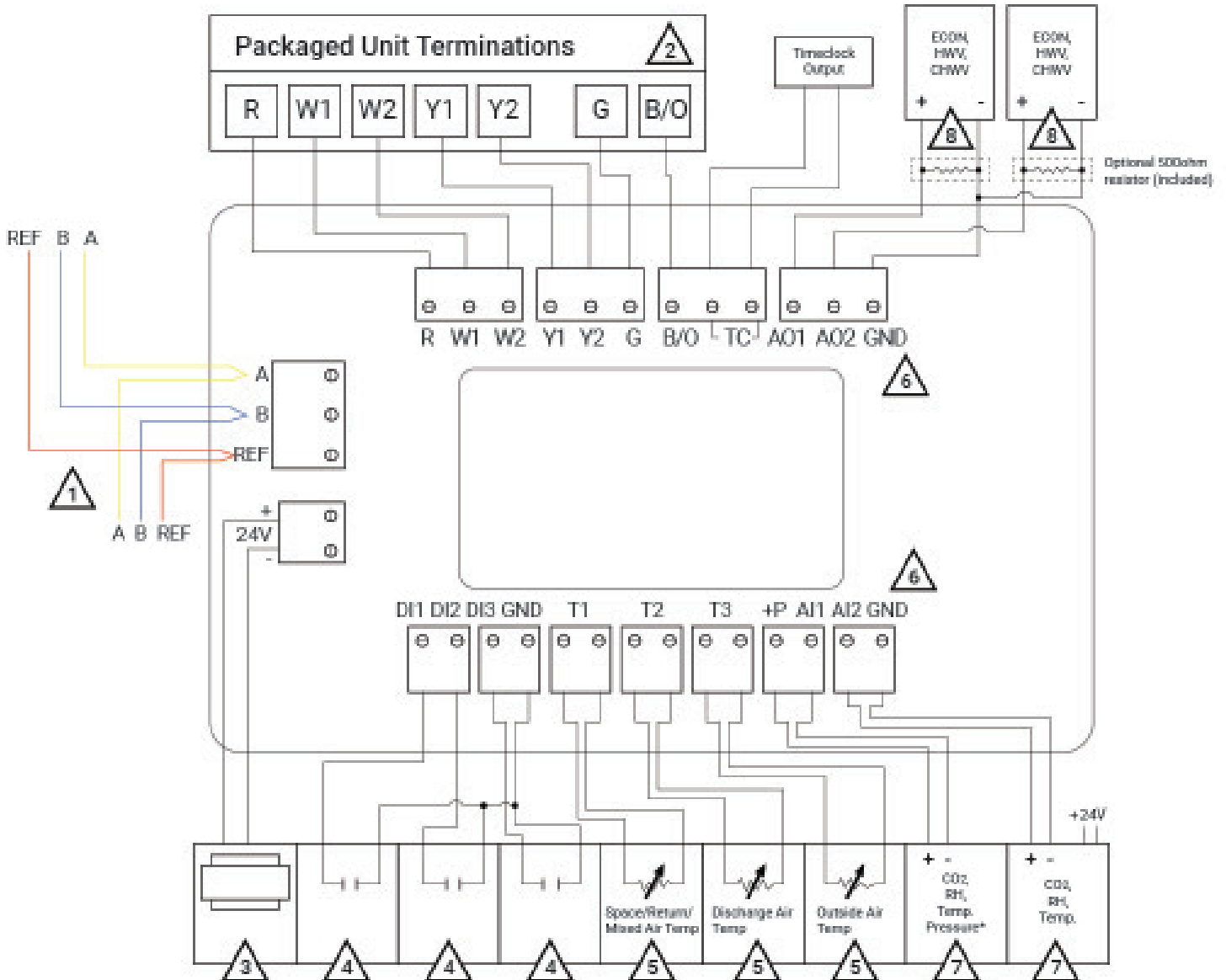
Packaged Unit Terminations

1 For communication wiring, use 3-conductor, twisted/shielded 22 AWG.

2 Control signals may be up to nominal 28 VAC from equipment transformer.

3 24 VAC transformer. See powering instructions.

4 Dry contact. Must not be powered.

5 For sensor input wiring, use 2-conductor, twisted/shielded 18 AWG.

6 GND terminal is used for self powered 4-20mA inputs and outputs.

7 4-20mA transmitter, sensor input wiring 18 AWG, twisted, shielded pair. AI1 is shown as 2-wire and AI2 is shown as Self-Powered sensors. Both inputs can be used for either type of sensor.

8 600 ohm max load. Do not power actuator with power from the thermostat. The thermostats are half-wave rectified, whereby the power ground is common with the signal ground.

1 For communication wiring, use 3-conductor, twisted/shielded 22 AWG.

2 Control signals may be up to nominal 28 VAC from equipment transformer.

3 24 VAC transformer. See powering instructions.

4 Dry contact. Must not be powered.

5 For sensor input wiring, use 2-conductor, twisted/shielded 18 AWG.

6 GND terminal is used for self powered 4-20mA inputs and outputs.

7 4-20mA transmitter, sensor input wiring 18 AWG, twisted, shielded pair. AI1 is shown as Self-Powered sensor. This input can be used for either 2-wire or self powered.

8 4-20 mA output 600 ohm max. Do not power actuator with power from the thermostat. The thermostats are half-wave rectified, whereby the power ground is common with the signal ground.

9 Unused terminal on this model.

Packaged Unit Terminations

1 For communication wiring, use 3-conductor, twisted/shielded 22 AWG.

2 Control signals may be up to nominal 28 VAC from equipment transformer.

3 24 VAC transformer. See powering instructions.

4 Dry contact. Must not be powered.

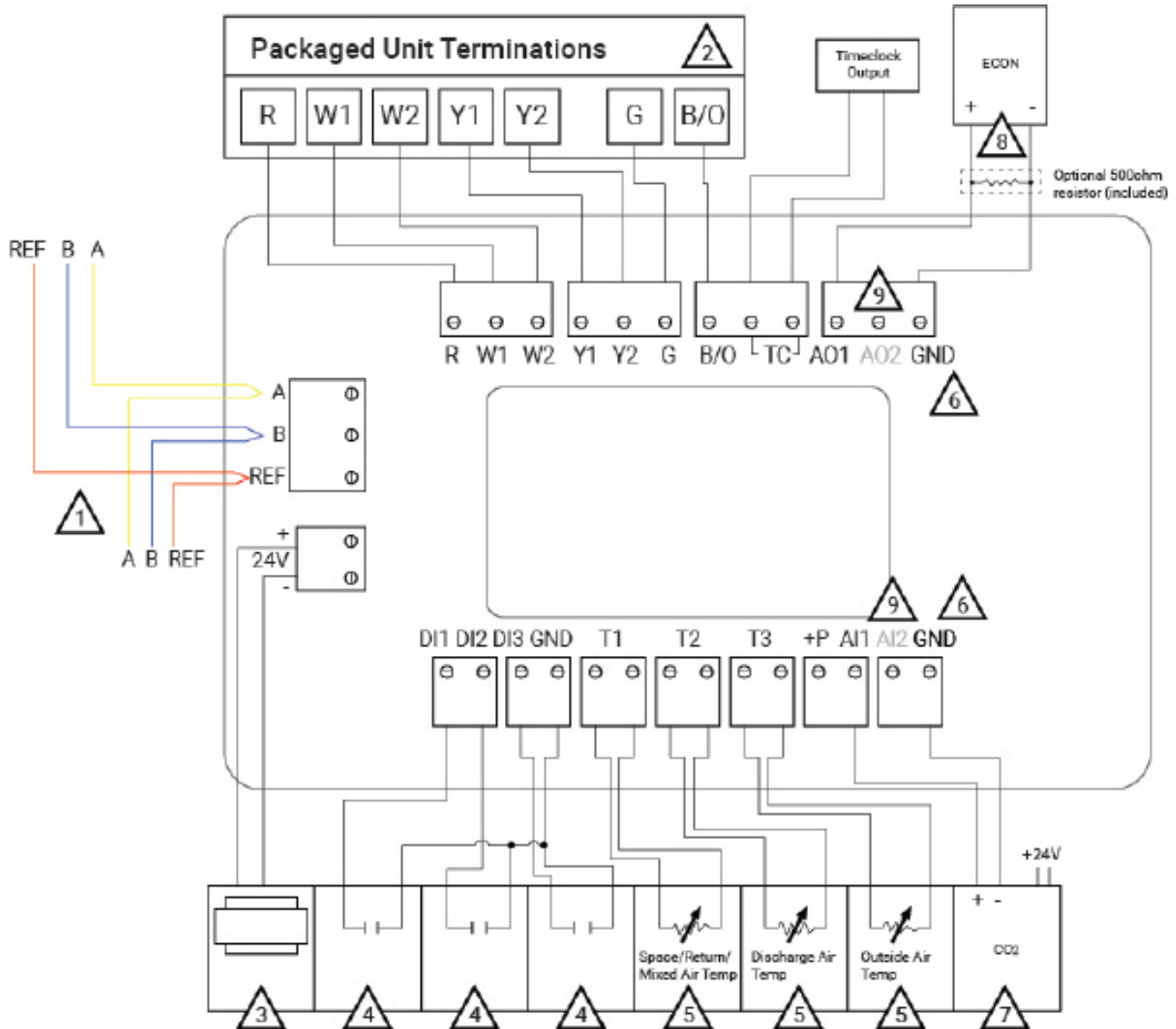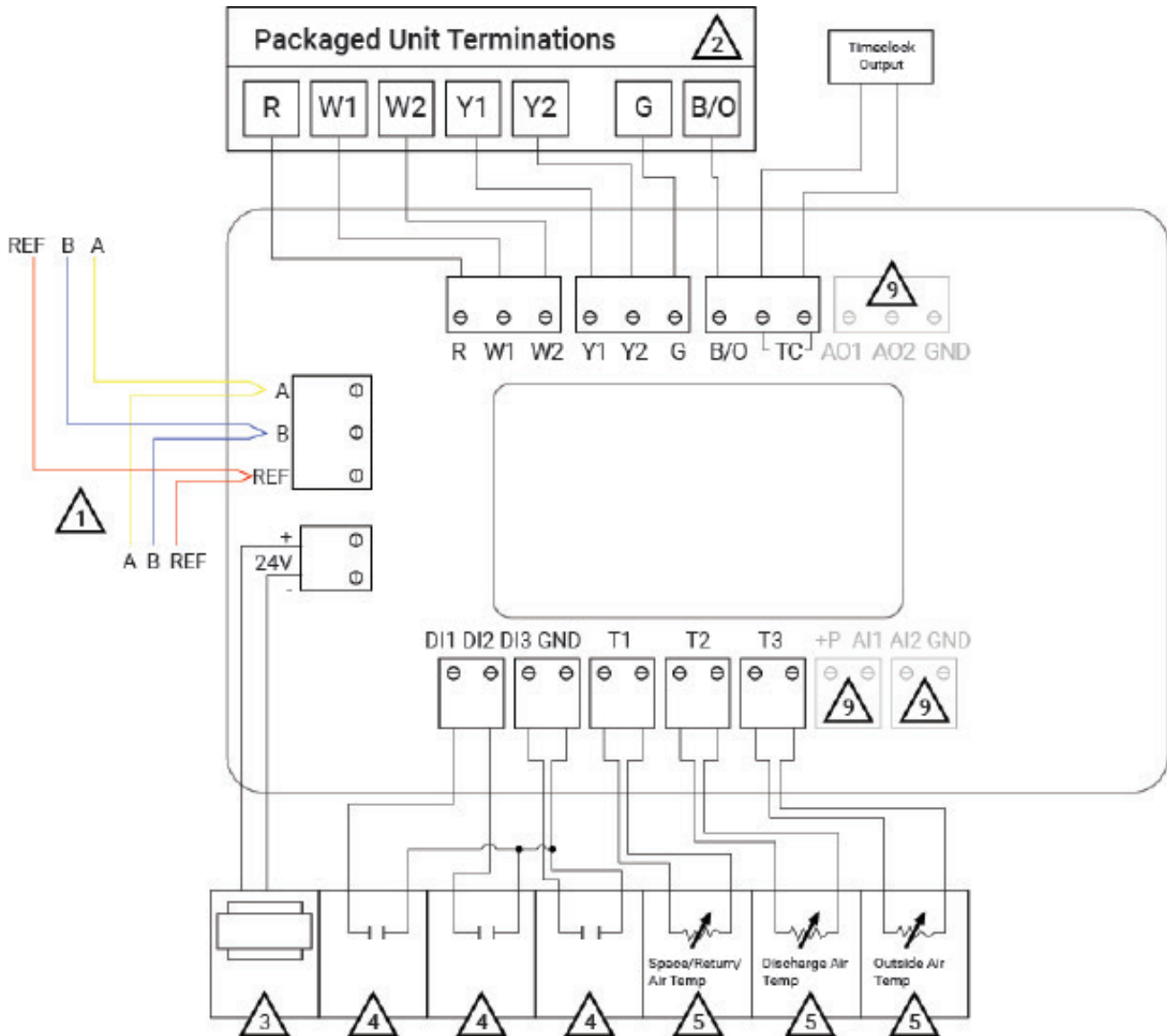5 For sensor input wiring, use 2-conductor, twisted/shielded 18 AWG.

9 Unused terminal on this model.

Packaged Unit Terminations ▲2

| R | W1 | Y1/W2 | G | B/O |

Timeclock Output

Zone Damper

HWV or CHWV

Optional 500ohm resistor (included)

R   W1   W2   Y1   Y2   G   B/O   TC   AO1   AO2   GND

REF   B   A

A
B
REF

A   B   REF

+
24V
-

DI1 DI2 DI3 GND   T1   T2   T3   +P AI1 AI2 GND

Space/Return/Mixed Air Temp

Discharge Air Temp

Outside Air Temp

▲1	For communication wiring, use 3-conductor, twisted/shielded 22 AWG.
▲5	For sensor input wiring, use 2-conductor, twisted/shielded 18 AWG.
▲2	Control signals may be up to nominal 28 VAC from equipment transformer.
▲6	GND terminal is used for self powered 4-20mA inputs and outputs.
▲3	24 VAC transformer. See powering instructions.
▲8	4-20 mA output 600 ohm max. Do not power actuator with power from the thermostat. The thermostats are half-wave rectified, whereby the power ground is common with the signal ground.
▲4	Dry contact. Must not be powered.
▲9	Unused terminal on this model.

3   Initial Setup

The UbiquiSTAT™ can be fully programed through the touchscreen, TCS Insight or Ubiquity Cloud. The quick start wizard assists in first time setup (see section 3.7), and the Settings screens can be used for additional setup. Advanced setup can be done using the internal BACnet explorer to edit the BACnet programming objects directly (see Appendix A for objects). TCS does not supply a BACnet configuration tool at this time, but any BACnet configuration tool an installer has access to can also be used to program the UbiquiSTAT™.

3.1   ROOM TEMPERATURE SENSOR SELECTION

The UbiquiSTAT™, by default, uses an internal temperature sensor. Remote temperature sensors can optionally be wired into the UbiquiSTAT™. There are three room temperature sensor options: internal, remote, and an average of the two. Room temperature selection is configured using the Room Temp Source screen (Home > Settings > Advanced > Room Temp Source) (see section 4.5.2.3).

Internal: This setting is the factory default.

Remote (T1): The room temperature is sourced from a sensor wired to the T1 input terminals.

Averaging: The room temperature is sourced from an average of the internal sensor and a sensor wired to the T1 input terminals. The weight of the average is also configurable, and can be used to divide the input of each sensor equally.

- **Single sensor on T1**: weight the internal 50% and the external 50%.
- **Two sensor temperature averaging kit**: weight the internal 35% and the external 65%.
- **Three sensor temperature averaging kit**: weight the internal 25% and the external 75%.

To setup your interface navigate to: Home > Settings > Advanced > Room Temp Source.

3.2   ADDITIONAL REMOTE RTD SENSORS

- **Discharge Air**: Wire sensor to T2 (no further configuration necessary).
- **Outdoor Air**: Wire sensor to T3 (no further configuration necessary).
- **Mixed Air**: `'40` `'50` Wire sensor to T1 (only available when T1 is not used for room sensing). Requires advanced configuration via the internal BACnet explorer (see section 4.5.2.6).

3.3   ANALOG INPUT (AI) SENSORS `'10` `'40` `'50`

Both AI1 and AI2 can be wired to accept any 0/4-20mA sensor input. Typically these are used to accept humidity, CO2, and temperature sensors. These inputs require advanced configuration through the internal BACnet explorer (see section 4.5.3.3). Analog input units display in percent of full scale by default.

3.4   DIGITAL INPUTS (DI)

There are three Digital Inputs; each may be configured in one of the following ways:

- Monitor Only
- Setpoint Setback
- Economizer Enable `'40` `'50`
- Service Status
- Filter Status
- Fan Proving
- Momentary Occupancy Override
- External Occupancy Override
- External Timeclock
- Aquastat `'10` `'50`

These inputs must be configured using the corresponding mode objects in the internal BACnet explorer screen. See section 4.5.2.6 for more information on the internal BACnet explorer screen. For an explanation of the features listed above, see section 5.

3.5 DIGITAL OUTPUTS (DO)

The various control outputs required by heat and cool stage control are mapped to physical terminal blocks on the controller via mechanical relays. The mapping depends on the mode of operation for the controller, and can even change dynamically during normal operation in heat pump mode. The relays' terminals are described by the color of wire that is traditionally used for that control wire:

Figure 2

Terminal Designator	Color	Function
R	Red	24V HVAC Unit Power
W	White	Heat
Y	Yellow	Cool
G	Green	Fan
B/O	Blue/Orange	Reversing Valve
TC	n/a	Time Clock

Mapping is done as shown in the table below, based on system type (conventional or heat pump), and mode of operation.

☞ If the 4th stage of heat or cool is desired in conventional mode, then the 3rd stage must also be enabled. Both of these stages are optional and must be configured using the internal BACnet Explorer.

Figure 3

Terminals (Relays)	Conventional	US4010/US4110 Only Conventional (Fan Powered Box)	Heat Pump (Normal)	Heat Pump (Low Limit Changeover)	Heat Pump (Emergency Heat)
W1	Heat 1	Heat 1	Heat 3	Heat 1	Heat 1
W2 *	Heat 2		Heat 4	Heat 2	Heat 2
Y1	Cool 1	Heat 2	Heat 1/Cool 1	Cool 1	
Y2 *	Cool 2		Heat 2/Cool 2	Cool 2	
G	Fan	Fan	Fan	Fan	Fan
B/O	Heat/Cool 3, 4 *		Reversing Valve	Reversing Valve	Reversing Valve
TC	Heat/Cool 3, 4 *				

* `'20` `'40` `'50`

Time Clock (TC): When used as a time clock output, this relay opens or closes based on the occupancy state. This relay is isolated from other heating and cooling relays, which share a common connection with the R terminal. If this output is used as a heating or cooling stage, the R terminal must be jumpered to one of the TC terminals. This is an open or close relay that will support 24V.

Reversing Valve (B/O): When the UbiquiSTAT™ is in heat pump mode, the B/O terminal is used as a reversing valve output. It may be configured as open or closed for cooling (the default is closed) via the polarity property. This can only be done through communications. It cannot be changed from the keypad. If the UbiquiSTAT is configured as conventional, it may be used as an additional heating or cooling stage.

`'10`   `'40`   `'50`

3.6 ANALOG OUTPUTS (AO)

There are up to two analog outputs (depending on model), AO1 and AO2. Both may be configured in programing as 0-20mA or 4-20mA and direct or reverse acting. These settings are available via the touchscreen under Settings>Advanced>Analog Outputs.

Direct Acting: The analog output increases as the input increases.

Reverse Acting: The analog output decreases as the input increases.

Output Range: Selectable as 0-20mA or 4-20mA.

☞ The output can be converted to 0-10V or 2-10V by connecting the included 500 Ohm resistor between AO and Ground terminal.

The factory defaults are direct acting and 4-20mA. Analog outputs can be configured for:

Heat: If set for heating, the analog output operates when the room temperature is at or below the heating setpoint, where 4mA is maximum heat (valve open) and 20mA is minimum heat (value is closed), by default.

Cool: If set for cooling, the analog output operates when the room temperature is at or above the cooling setpoint, where 4mA is minimum cooling (valve closed), and 20mA is maximum cooling (value is open), by default.

Economizer: `'40` `'50` The analog output operates when the mixed or discharge temperature is at or above 55F by default, where 4mA is minimum cooling (damper is closed), and 20mA is maximum cooling (damper is open), by default.

By default, the economizer is enabled when the following conditions are met:

- Outdoor air is below 55F (free cooling available).
- Occupancy mode is occupied.
- Call for cooling is needed.

☞ Economizer operation requires an outdoor air and discharge or mixed air input.

The following are additional features that can be programed using the internal BACnet explorer:

- Heat and Cool Aquastat
- Midpoint Control
- Demand Ventilation (CO_2 Control)
- Pre-occupancy Purge

3.7 ON SCREEN QUICK START WIZARD

When first powering on the UbiquiSTAT™ (or after a factory reset) a sequence of configuration screens will appear that must be completed before the thermostat becomes operational. All thermostat control and communication are disabled until the quick start wizard is complete.

Choose your desired settings for the following pages:

- Display Settings
- Date & Time
- Thermostat Type
- System Mode
- Occupied Fan Mode

- **Communication Mode**: TCSbus allows the UbiquiSTAT™ to reside on a network with TCS controllers. TCSbus mode requires a software upgrade of the Ubiquity Site Gateway.
  - **US4100**: TCSbus, BACnet MS/TP, BACnet/IP, None
  - **US4000**: TCSbus, BACnet MS/TP, None
- **Network Address**: This must be unique for each controller on the RS-485 network (* Not shown if BACnet/IP was selected). The valid address range is from 1-127. If an address of value 0 is desired this can be entered after the initial setup.
- **Baud Rate**: This defaults to 9,600 bps for TCSbus, and 38,400bps for BACnet MS/TP. All controllers on the network must use the same baud rate (* Not shown if BACnet/IP was selected).

- **Device Instance**: This number must be unique across the entire BACnet network. The initial value shown is a combination of the TCS BACnet vendor ID (496) and the previously entered network address. This is done in an attempt to create a unique value. However, users are encouraged to create their own numbering system for all controllers on the BACnet network (* If BACnet/IP was selected, no initial value is populated in this field).
- **WiFi Scan Screen**: If BACnet/IP was selected, this screen will show all WiFi networks in range. Click Connect on the network you wish to use.

4   User Interface

4.1   HOME SCREEN

The home screen provides at-a-glance system information and basic user controls. The navigation automatically returns to the home screen and the display dims after 10 minutes of inactivity (no touches detected). The basic components of the home screen are shown below in figure 4.

Figure 4
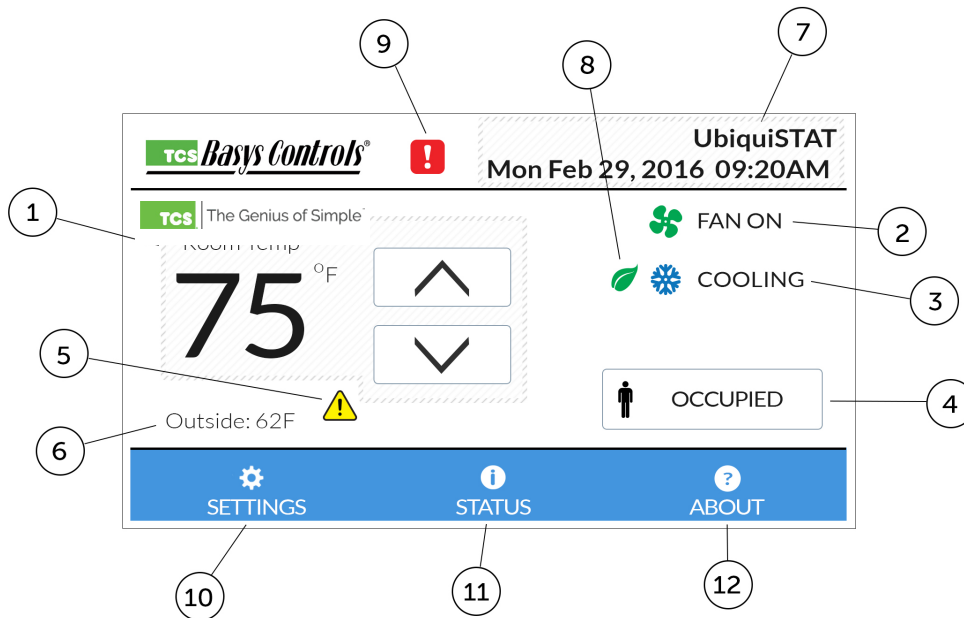
1. Room Temp and Setpoints: The room temperature is rounded to the nearest whole number. The currently active heat and cool setpoints are temporarily shown in place of the room temperature when using the up/down arrows or when the temperature value is touched. The up/down arrow raise and lower the heat and cool setpoints (User Setpoint Adjust) together to maintain the deadband. The up/down arrows change color (blue for cooler, orange for warmer) when a user setpoint adjustment is active.

2. Fan Status ❈ : This symbol is animated when the system calls for fan. Touching this symbol displays additional information including the fan mode.

3. System State: This indicates the present operation of the controller. Touching this symbol displays additional information including the Active System Mode (MSV-1005) and whether it is currently overriden by the network. The system states that may be displayed on the home screen include:

    a. Flame 🔥 : Heating is active.

    b. Snowflake ❄ : Cooling is active.

    c. Idle ⊖ : Neither heating nor cooling is active.

    d. Warning ⚠ : Heating or cooling lockout in effect. See section 5 for more information on this feature.

    e. Disabled ⊗ : The control is currently disabled and not heating or cooling. This is typically shown on startup during the power on delay, or when fan proving has failed.

4. Occupancy State: This button indicates the current occupancy state as being occupied 🚶 or unoccupied 🚷 . Touching this button overrides the occupancy state (switches between occupied/unoccupied) for three hours, or until a schedule change. The time when the override will expire is shown on the button. Touching and holding the

occupancy state button until the border changes (about 5 seconds), causes the override to hold until the next change in schedule. Whenever the occupancy state is overridden, touching the Occupancy State button again cancels the override.

The following BACnet objects configure the use of this button:

- Occupancy Override Mode: MSV-701
- Occupancy State Override Time: PIV-703

5. **DI Setpoint Setback Active Indicator** ⚠ : This symbol is visible when DI Setpoint Setback is active. Touching this symbol displays a brief explanation of the feature. See section 5 for an explanation of this feature.

6. **Info Text**: This two line text field may be written from the network, and can be useful for showing additional information such as the current weather. If not being written from the network, the outdoor air temperature is visible whenever a sensor is physically connected, or when the thermostat is receiving a valid outdoor temperature reading. Info text can be customized via CSV-506.

7. **Display Banner**: The display banner contains the current date and time, and may contain the device name. The device name is typically used describe what area or unit the thermostat is controlling. The device name can only be changed using Ubiquity Cloud or an external BACnet configuration tool . The time can be set to display in a 12 hour or 24 hour format using the Date/Time screen in the Advanced Settings menu. The contents of the banner can be customized using MSV-505.

8. **Economizer** 🍃 : ['40] ['50] This symbol is visible when the Economizer is active. Touching this symbol provides a brief explanation of this feature. See section 5 for an explanation of this feature.

9. **Service Status Indicator** 🔲! : This symbol is visible only when one or more service status is active. Touching this symbol navigates to the service status screen where any active service status is viewable. When there are more than one service status active, a plus sign next to the [!+] symbol. See section 4.3 for more information on service status.

10. **Settings**: Touching this button navigates to the Settings menu. If an access code has been set, the user will be prompted to enter the code before they are permitted to proceed to the Settings screens. See section 4.5 for more information on Setting screens. All programming is done on these screens.

11. **Status**: Touching this button navigates to the Status screens. See section 4.2 for more information on the Status screens.

   ☞ Touching and holding the Status button for 5 seconds brings up a dialog asking the user if they would like to force a device restart. If confirmed, the UbiquiSTAT™ immediately restarts.

12. **About**: Touching this button navigates to the About screen. This screen shows product information, such as versioning and serial number. See section 4.4 for more information about the About screen.

4.2 STATUS SCREENS

Touching the Status button on the home screen will bring up the Status screens. These screens display real time information about the state of the control as well as inputs and outputs. This information is grouped into three sub screens: system, advanced, and network.

4.2.1 System Status

Figure 5

SYSTEM STATUS   03:31:45PM

State: Cooling	Cool Setpoint: 75.0F
Schedule: Occupied A	Heat Setpoint: 70.0F
Next Schedule: Unocc @ 05:00PM	Service Status: [1!]

Inputs

Room:	75.4F
Outside:	74.8F
Discharge:	50.3F
Mixed:	--
Humidity:	0.5%
CO2:	8.7ppm

Relay Outputs

- ● Rev. Valve: ON (Cooling)
- ● Compressor 1: ON
- ○ Compressor 2: OFF
- ○ Aux Heat 1: OFF
- ○ Aux Heat 2: OFF
- ● Fan: ON

[SYSTEM] [ADVANCED] [NETWORK] [🏠 HOME]

☞ System Status screen details vary pending on model specific features.

Information on the system status screen is broken into three groups:

- **System** (top)
  - State: The current system state. This is the same as the system state shown on the home screen.
  - Schedule: The currently active setpoint pair.
  - Next Schedule: The next change in schedule as well as the time that it will occur. Only schedule changes less than 24 hours away are shown.
  - Cool and Heat Setpoints: The setpoints currently in use by the thermostat.
  - Service Status: This button displays the number of currently active Service Statuses. If there are no active Service Statuses, the button reads "Ok" and is disabled. Touching this button navigates to the Services Status screen, (same as touching service symbol on home screen) where any active Service Statuses are viewable.

- **Inputs**: These are the primary control points, shown with the same precision used by the controller. This is useful when the rounding shown on the home screen is insufficient to explain the control behavior. When an input value is not available (not configured or no sensor connected), dashes are displayed. The following inputs are shown:

  - Room Temperature: The temperature of the space (zone) being controlled.

  - Outside Temperature: The temperature of the outside air sensor.

  - Discharge Temperature: The temperature of the discharge air sensor.

  - Mixed Temperature: `'40` `'50` The temperature of the mixed air sensor.

  - Humidity: `'50` The percent relative humidity (% RH) of the space.

  - CO_2: `'40` `'50` The carbon dioxide content (parts per million) of the space.

- **Relay Outputs**: The contents depend on the programed thermostat type.
  - Conventional: Each available heat and cool stage is shown. Additional stages (use of TC and B/O relays for 3rd and 4th stages) become visible when configured as available stages. The status of the fan is included. The status of each output is shown with an indicator light and state text. The table below shows the meaning of the symbols.
  - Heat Pump: The reversing valve relay (B/O) has an indicator light next to it that is always lit: red when heating, and blue when cooling, this is also shown in the text. Two compressor stages and two auxiliary heat stages are displayed along with the fan status. The status of each output is shown with an indicator light and state text. The table below shows the meaning of the state text.

Figure 6

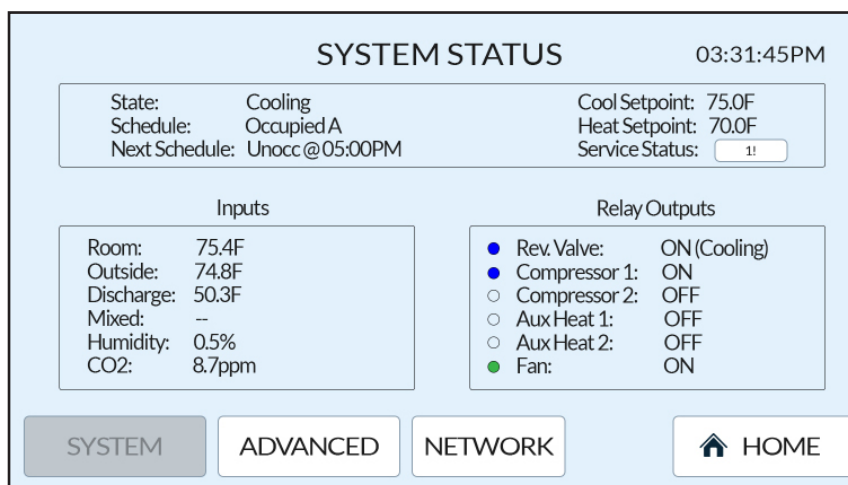| Relay State	On	Off	Disabled	Low Limit Changeover (Heat Pump Compressors)	Network Override
Indicator Light	Lit	Not Lit	Hidden	Not Lit	Same as On/Off
Text	"ON"	"OFF"	"--"	(Protect)	"(ON!)" / "(OFF!)"

4.2.2 Advanced Status

Figure 7

☞ Advanced Status screen details vary pending on model specific features.

Information on the advanced status screen is broken into four groups:

- **Operating Modes**:
  - **Type:** The programmed thermostat type (conventional or heat pump).
  - **System:** Active System Mode (MSV-1005). If this value is being overriden from the network, an exclamation point (!) is visible after the mode text (i.e. - System: Auto!)
  - **Fan:** The active fan mode.

- **Digital Inputs**: The status of each Digital Input is shown with both an indicator light and text. Additionally, the programmed mode of the Digital Input is shown next to the status text.

- **Economizer**: `'40` `'50`
  - **Enabled:** Indicates whether the economizer is currently allowed to modulate open. This depends on the occupancy state, whether free cooling is available, and if cooling is needed.
  - **Free Cooling:** Indicates when the economizer feature determines that free cooling is available. This depends on the programed economizer mode. For example, in dry bulb setpoint mode, free cooling is indicated as available when the outside air temperature is below the economizer drybulb setpoint.
  - **Freeze Protect:** Indicates that the outside air damper is being modulated closed in order to protect equipment from freezing.

- **Analog Inputs & Outputs**: (model specific)
  - **Analog Inputs:** Two values are shown for each of the analog inputs. The value on the left shows the reading in milliamps, while the value on the right shows the input scaled to engineering units.
  - **Analog Outputs:** Two values are shown for each of the analog outputs. The value on the left shows the output in milliamps, while the value on the right shows the output as a percent of full range. Additionally, the mode of the analog output is shown next to the percentage.

4.2.3 Network Status
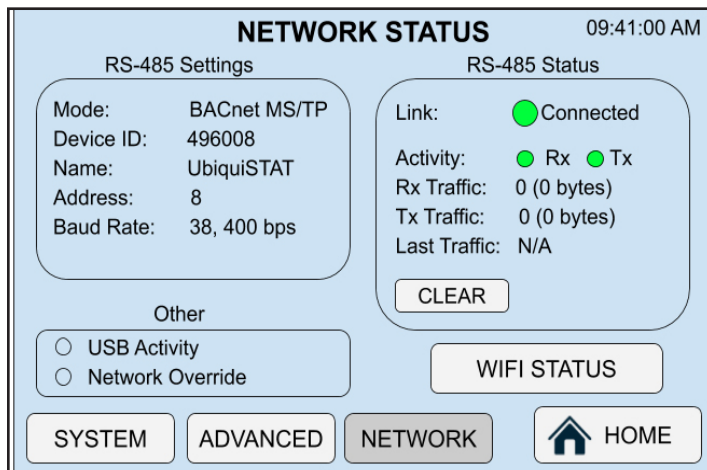
Figure 8a - RS-485   *Figure 8b - WiFi*
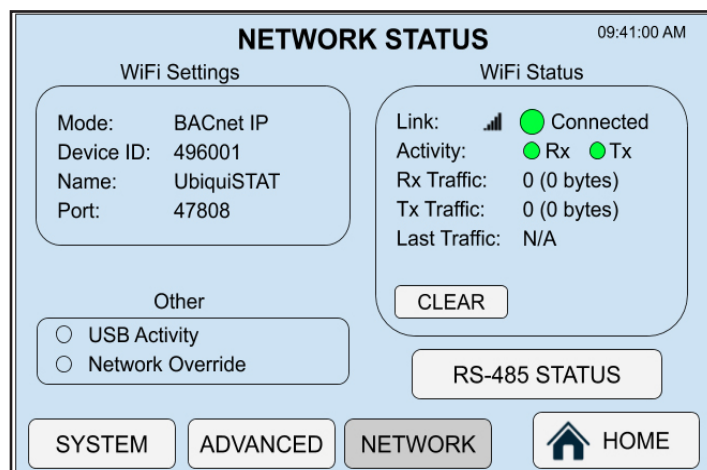
Information on the advanced status screen is broken into four groups:

- **RS-485 Settings**:
  - **Mode:** This indicates the programmed network mode (TCSbus or BACnet MS/TP).
  - **Device ID:** The programmed device instance number. Device instance numbers are specific to BACnet MS/TP and are not used in the TCSbus protocol.
  - **Name:** The programed device name.
  - **Address:** The programmed device address.
  - **Baud Rate:** The programmed device baud rate.

- **WiFi Settings:**
  - **Mode:** Always BACnet IP
  - **Device ID:** The programmed device instance number for BACnet network.

- **Name:** The programed device name.
- **Port:** UDP used for BACnet communication.

• **RS-485 or WiFi Status**:
  - Link: Indicates the overall status of the network connection. This consists of both an indicator light and associated text. Touching the text brings up a dialog box with additional status information. The following states may be shown:
    □ Connected (Green): The UbiquiSTAT™ has detected a valid network connection. For BACnet MS/TP, this means that the device has successfully joined the token ring. For TCSbus, this means the device has received a valid message from the network.
    □ Troubleshoot (Yellow): The UbiquiSTAT™ is able to communicate, but is detecting problems with the network that may cause the communication to be unreliable. Check the RS-485 wiring and network configuration on other devices.
    □ Disconnected (Red): The UbiquiSTAT™ has not detected a valid network connection. For BACnet MS/TP this means the device has not joined the token ring. For TCSbus this means the device has not received a valid message from the network.

  - **Activity:** There are two indicator lights; one for data received (Rx), and one for data transmitted (Tx). These lights blink whenever data is received or transmitted to or from the device respectively. They are useful as a basic diagnostic in determining whether data is flowing across the network.
  - **Rx Traffic:** This is a statistic that indicates how much network traffic has been received by the UbiquiSTAT™. Shown are both the number of messages and the total number of bytes. This number should be increase whenever the thermostat is monitored or programed via the network (Gateway and/or Ubiquity Cloud).
  - **Tx Traffic:** This is a statistic that indicates how much network traffic has been transmitted by the UbiquiSTAT™. Shown are both the number of messages and the total number of bytes. This number should be increase whenever the thermostat is monitored or programed via the network (Gateway and/or Ubiquity Cloud).
  - **Last Traffic:** This shows the time stamp of the last time network traffic was received by the UbiquiSTAT™.
  - **Clear:** This button clears the network traffic statistics. This includes: Rx Traffic, Tx Traffic, and Last Traffic.

• **Other**:
  - **USB Activity:** This indicator light is lit whenever there is traffic detected on the USB port.
  - **Network Override:** This indicator light is lit whenever any of the BACnet objects are being commanded remotely from the network. This occurs, for example, whenever a sub system is implemented for the network through Ubiquity Cloud. The internal BACnet explorer screen can be used to determine precisely which BACnet object(s) is/are being externally commanded (see section 4.5.2.6).

4.3 SERVICE STATUS

Service Status is defined as a state of the controller or HVAC equipment that requires action by the end user to resolve. When a service status is active, a red badge is visible on the top of the home screen to the right of the TCS logo. Touching this badge presents the service status viewer, which shows all active service statuses and when they were detected. The UbiquiSTAT™ may be configured to report the following service conditions:

Fan Proving Failure: When a DI is configured for Fan Proving, the system will shut down if the fan is not detected as operational after a call from the controller. More information on this feature can be found in section 5. The fan proving status can be reset from the service status screen, thereby re-enabling system control.

Check Filter: When a DI is configured for Check Filter, service status will indicate the need to replace the air filter. The Check Filter status is present whenever the DI is active, and is absent when the DI is inactive. This status is automatically cleared when the filter is changed and the status becomes inactive.

Discharge High: When the discharge temperature exceeds the high limit value, the heat control is shut down until the condition no longer exists.

Discharge Low: When the discharge temperature drops below the low limit value, the cool control is shut down until the condition no longer exists.

DI1 - DI3: When a DI is configured for reporting service status, it indicates when the DI is active. A text message can be customized for each DI.

4.4 ABOUT SCREEN

This screen shows basic information about the UbiquiSTAT™ including:

- Model
- Device Name
- Device ID
- Serial Number
- Firmware Version
- Hardware Version

4.5 SETTINGS

4.5.1 Basic Settings

4.5.1.1 Fan mode

The fan mode may be set differently for occupied vs. unoccupied occupancy modes. There are four fan modes that may be selected:

- **On**: The fan runs continuously.
- **Auto**: The fan runs only when there is a call for heat or cool.
- **Cool**: The fan runs only when there is a call for cool (available only when thermostat type is conventional).
- **Auto + Recirc**: The same as auto but with additional run time if necessary to satisfy minimum air circulation requirements (see section 5 for more information).

4.5.1.2 Setpoints

There are four occupied heating and cooling setpoint pairs and one unoccupied setpoint pair. The pair is in effect when the corresponding schedule is active. A minimum dead band of one degree between heat and cool setpoints is enforced, however, a deadband of at least two degrees is recommended.

4.5.1.3 Date and Time

Set the date and time to ensure correct scheduling.

4.5.1.4 System Mode

There are six system modes:

- **Off**: All relays and analog outputs are set to their inactive state; no control is performed.
- **Auto**: Controls both heating and cooling.
- **Heat**: Controls only heating.
- **Cool**: Controls only cooling.
- **Off+Recirc**: Same as off but with fan recirc enabled.
- **Emergency Heat**: Controls only auxiliary heating (heat pump only)

- The system mode setting screen edits the BACnet object System Mode (MSV-1000). This value is automatically reflected by the control in the BACnet object Active System Mode (MSV-1005) at priority 16. If the Active System Mode is currently commanded from the network (at a priority higher than 16), a warning is shown when entering the screen and any changes made will cancel the network override.

4.5.1.5 Schedule

There are four occupied weekly setpoint pairs (A,B,C,D), one unoccupied setpoint pair, and holidays that may be scheduled. Weekly schedules are created using setpoint pairs and start times. Each setpoint pair can be used multiple times to create up to eight schedule changes per day. At midnight each day the system automatically transitions to unoccupied, which uses the unoccupied heating and cooling setpoints. If no schedule changes are set for a particular day, the UbiquiSTAT™ will be unoccupied for that entire day. If a schedule requires an occupied setpoint at midnight a schedule change must be created for midnight (12:00 AM) in order to defeat the default behavior. Holiday schedules are available with thirty (30) entries. Select new and choose month, day and year for a single occurance where the system will revet to the unoccuppied mode.

☞ *Different from SZ Series Thermostats*: Schedules no longer start and stop as they did on TCS SZ thermostats. Schedules now only transition from schedule to schedule.

☞ The examples below assume the following setpoints:

- **Occupied A**: heat=70, cool=75 (best suited for customer comfort in a store)
- **Occupied B**: heat=65, cool=80 (best suited for after-hours employee work in store)
- **Unoccupied**: heat=60, cool=80 (most economical when building is unoccupied)

Normal Schedule Example: This schedule represents a business that opens at 8:00AM and closes at 5:00 PM weekdays. By default each day begins as Unoccupied at 12:00 AM.

Figure 9

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Occupied A @ 8:00 AM	Occupied A @ 8:00 AM	Occupied A @ 8:00 AM	Occupied A @ 8:00 AM	Occupied A @ 8:00 AM		
Unoccupied @ 5:00 PM	Unoccupied @ 5:00 PM	Unoccupied @ 5:00 PM	Unoccupied @ 5:00 PM	Unoccupied @ 5:00 PM		

12:00 AM Monday (midnight): The automatic transition to Unoccupied has no effect because the system was already Unoccupied.

8:00 AM Monday: System changes to Occupied A schedule, which uses the A heating and cooling setpoints.

5:00 PM Monday: System changes to Unoccupied schedule which uses the Unoccupied heating and cooling setpoints.

Saturday and Sunday: The Unoccupied setpoints are in effect for the entire day.

Setpoint Change Example: This schedule represents a business that opens at 10:00 AM and closes at 9:00 PM weekdays, and closes at 8:00 PM on weekends. On weekdays this business has a cleaning crew that comes in for two hours after close. This business has set a different schedule (group of setpoints) for the cleaning crew compared to their daytime employees.

Figure 10

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Occupied A @ 10:00 AM	Occupied A @ 10:00 AM	Occupied A @ 10:00 AM	Occupied A @ 10:00 AM	Occupied A @ 10:00 AM	Occupied A @ 10:00 AM	Occupied A @ 10:00 AM
Occupied B @ 9:00 PM	Occupied B @ 9:00 PM	Occupied B @ 9:00 PM	Occupied B @ 9:00 PM	Occupied B @ 9:00 PM	Unoccupied @ 8:00 PM	Unoccupied @ 8:00 PM
Unoccupied @ 11:00 PM	Unoccupied @ 11:00 PM	Unoccupied @ 11:00 PM	Unoccupied @ 11:00 PM	Unoccupied @ 11:00 PM		

12:00 AM Monday (midnight): The automatic transition to Unoccupied has no effect, because the system was already Unoccupied.

10:00 AM Monday: Store opens and schedule changes to Occupied A schedule, which uses the A heating and cooling setpoints.

9:00 PM Monday: Store closes and cleaning crew arrives. System changes to Occupied B schedule, which uses the B heating and cooling setpoints.

11:00 PM Monday: Cleaning crew leaves. System changes to Unoccupied schedule which uses the Unoccupied heating and cooling setpoints.

Bar/Restaurant Schedule Example: This schedule represents a bar or restaurant that opens at 10:00 AM, and closes at 2:00 AM the next day, and is closed on Sunday. To stay Occupied after midnight, an entry is created to override the automatic change to Unoccupied.

Figure 11

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Occupied A @ 10:00 AM	Occupied A @ 12:00 AM	Occupied A @ 12:00 AM	Occupied A @ 12:00 AM	Occupied A @ 12:00 AM	Occupied A @ 12:00 AM	Occupied A @ 12:00 AM
	Unoccupied @ 2:00 AM	Unoccupied @ 2:00 AM	Unoccupied @ 2:00 AM	Unoccupied @ 2:00 AM	Unoccupied @ 2:00 AM	Unoccupied @ 2:00 AM
	Occupied A @ 10:00 AM	Occupied A @ 10:00 AM	Occupied A @ 10:00 AM	Occupied A @ 10:00 AM	Occupied A @ 10:00 AM	

10:00 AM Monday: Bar/Restaurant opens and system transitions to Occupied A schedule, which uses the A heating and cooling setpoints.

12:00 AM Tuesday - Saturday: This entry causes Occupied A schedule to remain in effect, overriding the automatic transition to Unoccupied.

2:00 AM Tuesday - Saturday: Bar/Restaurant closes and system changes to Unoccupied schedule, which uses the Unoccupied heating and cooling setpoints.

10:00 AM Tuesday - Saturday: Bar/Restaurant opens and system transitions to Occupied A schedule, which uses the A heating and cooling setpoints.

12:00 AM Sunday: This entry causes Occupied A schedule to remain in effect, overriding the automatic transition to Unoccupied.

2:00 AM Sunday: Bar/Restaurant closes and system changes to Unoccupied schedule, which uses the Unoccupied heating and cooling setpoints.

4.5.2 Advanced Settings

4.5.2.1 Analog Output

For more information on analog outputs, see section 3.6 above. The first screen provides a summary of the current configuration for each of the two analog outputs and an entry point to the programming screens. On the programming screen, text on the right side describes how the current configuration behaves at either end of the output range.

The programming screen offers limited programing options in order to allow for quick and simple initial setup. Use the internal BACnet explorer to perform full configuration.

Mode:

Off: No control is performed. Analog output is fixed at 0%. The actual output in milliamps depends on action and range settings below.

Heat: `'10` `'50` The analog output operates at or below the heating setpoint to modulate heating equipment.

Cool: `'10` `'50` The analog output operates at or above the cooling setpoint to modulate cooling equipment.

Economizer: `'40` `'50` The analog output operates at or above the economizer setpoint to modulate an outdoor air damper. The economizer is enabled using the dry bulb setpoint mode.

Action:

Direct Acting: The analog output increases as the input increases.

Reverse Acting: The analog output decreases as the input increases.

Range: Selectable as 0-20mA or 4-20mA.

4.5.2.2 Temperature Calibration

The UbiquiSTAT™ has four temperature inputs: three RTD inputs (T1, T2, T3), and an internal digital temperature sensor. These inputs are factory calibrated. However, an installation may have inherent measurement inaccuracies from sources such as sensor lead resistance and sensor placement. Therefore, a field calibration may be required. Factory calibration is permanently stored in the thermostat and is not affected by field calibration. The calibration is a simple offset applied to the raw temperature reading.

When preforming this calibration, use the up and down arrows to match the temperature reading on the screen to the reference temperature (Settings > Advanced > Temp Calibration). The calibrated reading, as well as the original reading, and calibration offset, are displayed on the screen and are adjusted by increments of 0.1 degree Fahrenheit or Celsius.

4.5.2.3 Room Temp Source

Room temperature is used for all of the UbiquiSTAT™ temperature control logic. Select the temperature source: internal, remote, or average of internal and remote. The temperature source buttons each display a live reading corresponding to their source. When the averaging method is chosen, the averaging controls become visible. Use the up and down arrows to set the averaging ratio as desired. Each touch of the up and down arrows changes the value by 5%. See section 3.1 for more information.

4.5.2.4 Network Settings

RS-485

> **Baud Rate**: All controllers on the network must use the same baud rate.
>
> **Mode**: All controllers on the network must use the same protocol. Mixing BACnet, ModBus, or other protocols on the same network is not allowed. TCSbus must be used when the UbiquiSTAT™ is used on an existing TCS network.
>
> **Address**: All controllers on the network must have a unique address.
>
> **Device Instance Number (BACnet MS/TP Only)**: This number must be unique across the entire BACnet network. The default value is a combination of the TCS BACnet vendor Id (496) and the previously entered network address. This is done in an attempt to create a unique value. However, users are encouraged to create their own numbering system for all controllers on the BACnet network.

BACnet WiFi

> **Enable/Disable:** Turn on and off WiFi communication and related BACnet/IP features.
>
> **Scan Wifi Networks:** Starts a scan for available networks. Enter password.
>
> **Port:** Select the IP port to use for BACnet traffic.
>
> **Device Instance:** This number must be unique across the entire BACnet network. Users are encouraged to create their own numbering system for all controllers on the BACnet network.

4.5.2.5 Thermostat Type

Choose heat pump thermostat or conventional thermostat based on the equipment being controlled. Select heat pump thermostat when direct control of the reversing value is required. When the heat pump thermostat type is selected the B/O relay is used to control the direction of a reversing valve. By default the relay is energized (closed) when controlling for cooling.

4.5.2.6 Internal BACnet Explorer

This advanced configuration tool allows browsing and editing of most of the available settings in the UbiquiSTAT™, many of which are not available through the other user interface screens. Each explorer screen shows a single property of a BACnet object. These same object properties can also be viewed over the network with BACnet network tools.

Figure 12
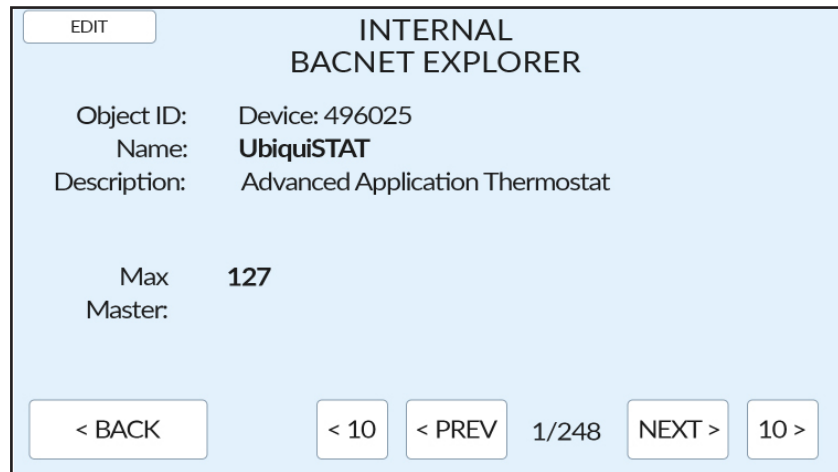
Objects that can be changed have an Edit button in the top left corner of the screen that brings up an edit screen appropriate for the property data type. The edit screen contains a Load Default button, that when touched, loads the default value into the editor (but does not save the value). If the BACnet object is commandable and its present value is currently being commanded from the network, then the value field will include the text, "Network Override".

The following navigation tools allow efficient browsing:

Screen Index: This displays the current object's position relative to the total number of objects.

BACnet Object ID: This is shown at the top of the screen. This is used to locate the object when accessing it via the network.

Next/Prev: Advances forward/backward one object at a time. Navigation wraps in both directions.

<10/10>: Advances forward/backward 10 objects at a time. Navigation wraps in both directions.

The internal BACnet Explorer has the following limitations:

• Only the present value property of objects are shown (or editable), with the exception of the device object, which presents the Max Master MS/TP communication property. Therefore, properties such as the relay minimum on/off times and polarity are not accessible.

• Only properties that are part of the controller programming (stored in non-volatile memory) are editable. This excludes any objects that are commandable (or may overridden) via the network.

• Text strings are not editable, therefore character string value (CSV) objects may not be changed.

See Appendix A for a list of all BACnet objects.

☞ While the object list in each model may vary due to feature being added or removed, the order of objects as shown by the index number in the explorer is maintained and follows the order of the objects as listed in appendix A. Appendix A is a complete object list covering all models.

4.5.2.7 Factory Defaults

Selecting this menu item will cause the UbiquiSTAT™ to change all settings to their factory default values. The UbiquiSTAT™ will then restart and display the quick start wizard. For example, this feature may be used when re-purposing a thermostat.

⚠ All previous programing will be lost!

4.5.2.8 System Event Log

The system event log contains entries for the last 100 events. An event can be one of three classes: info, action, and fault. Events contain a timestamp, description, and possibly an internal programming code (meaningful only to TCS tech support). Additional information is displayed for certain events as available.

Info: Describes events in the system for informational purposes only. An example is service status history which records any service status activity including duration.

Action: Describe changes made to the device from a local user or an outside programming source (i.e. Ubiquity Cloud).

Fault: These are only reported by the firmware when an unexpected behavior is detected in the code. Please report any faults to TCS tech support.

4.5.2.9 Display

The display setting screen consist of:

Temperature Units: Fahrenheit / Celsius.

☞ This setting only effects how temperature values are displayed on the screen. This does not affect the values visible through RS-485 communication. All values on the RS-485 port are in units of Fahrenheit.

Time Format: 24 hour / 12 hour.

Backlight Brightness: Low / Medium / High.

When using the "Low" setting for the "Display Brightness", the display will go completely dark after 10 minutes of inactivity. *Note: Prior to UbiquiSTAT version 1.01.1, the Low setting will dim the display, but it will not go completely dark.*

4.5.2.10 System Test Mode

When installing or servicing a controller or HVAC system, it is often necessary to test out the connections and basic setup. This requires forcing the controller to activate its various outputs to prove that the system has been installed correctly. The system test mode facilitates this by providing a simple test interface.

When entering the system test mode, all internal control logic is disabled and the outputs are all set to their inactive (relays) or 0% (analog outputs) state. Control is resumed when the system test mode is exited, or after 10 minutes of inactivity.

WARNING: There is no equipment protection in this mode. Damage may happen if proper and safe sequencing is not followed.

Figure 13
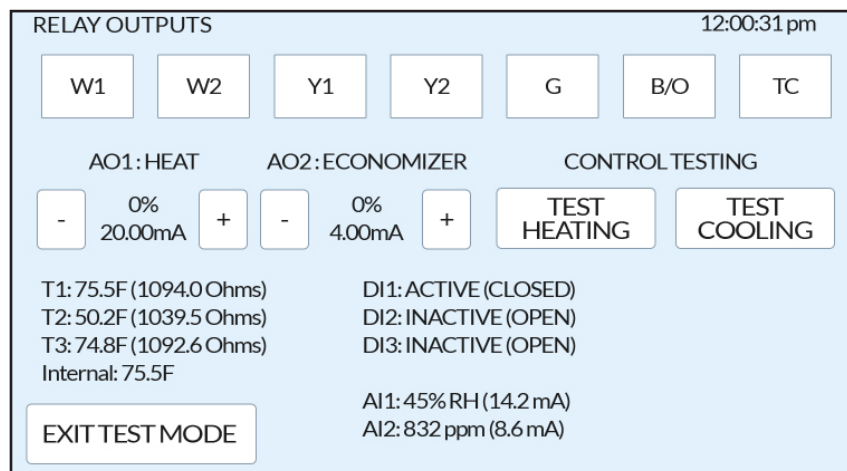
☞ System Test screen details vary pending on model specific features.

Relay Outputs: The square toggle buttons at the top of the screen allow direct manipulation of the relays. When the button is highlighted, the relay is active, and the connected equipment should turn on. After a relay button is touched, there is a 3 second delay before the changes apply. Turning on a heating or cooling relay also turns on the fan relay [G] as equipment safety precaution. The fan relay can be turned off subsequently. If toggled off within the three second delay the fan will not turn on.

Analog Outputs: The configuration of each analog output is identified on the screen. Each analog output can be adjusted up or down in 10% increments. The percentage output corresponds to the amount of heating or cooling desired. The mA output shows the actual signal being sent, taking into account reverse/direct action and 0/4-20mA range.

Control Testing: The Control Testing buttons simulate a large need for heating or cooling, and allows the controller to manipulate the respective outputs. During this process, all programed sequencing and delays are in effect. The heat/cool lockout logic is disabled during this testing in order to allow the heating and cooling to be tested in any season, however, the discharge air limits are allowed to operate as this is part of the testing. A heating or cooling test runs for ten minutes (unless canceled), with a countdown timer shown. Also, the affected analog outputs are driven immediately to the appropriate Max/Min levels. When a test is active the manual control of relays and analog outputs is disabled. However, the state of each relay is still reflected by its button's toggle (highlighted) state.

While control testing is in progress, the inputs can be monitored to verify correct equipment operation.

Controller Inputs: Located on the bottom half of the screen, the inputs are updated once a second. They are useful for monitoring the test in progress, and are broken into three groups:

- **Temperature Sensors**: Temperature readings as well as Ohms for T1, T2, T3, and the internal sensor are shown. For troubleshooting purposes the RTD inputs report both open circuit and shorted circuit conditions. An open circuit means there is likely either no sensor connected, a broken wire, or the sensor is reporting a value above the range of the input. A short circuit means wires are shorted together, or the sensor is reporting a value below the input range.
- **Digital Inputs (DI)**: Shown is whether the DI is sensing open or closed contacts as well as how the state is interpreted internally (active or inactive). Typically, active refers to a closed contact and inactive refer to open contact (when polarity is normal).
- **Analog Inputs (AI)**: The value is shown as being scaled to engineering units as well as the raw milliamperage.

4.5.2.11 Access Code

This access code, if enabled, prevents unauthorized access to all setting screens. By default, the access code is disabled. The access code consists of four digits; the access code "0000" disables the access code feature. If you have lost or forgotten your code please call TCS Tech Support.

4.5.3 Expert Settings

By default, the UbiquiSTAT™ ships with two stages of heat and two stages of cool enabled (based on model feature availability). Each stage may be independently disabled in order to prevent it from being considered by the control logic. This can be useful if, for example, the connected equipment does not support the stages, or to correct for a wiring error.

Stages can be enabled and disabled using the internal BACnet explorer screen. Each stage has an object that can be configured to enable or disable the given stage. See the object list in Appendix A.

4.5.3.2 Configuring Additional Stages `'20` `'40` `'50`

When configured as a conventional thermostat type, the B/O and TC relays may be used as third and/or fourth stages of heating and/or cooling (based on model feature availability). In order to make these relays available as additional stages, the corresponding relay mode object must be configured appropriately. For example, to configure the B/O relay as a third stage of heat, configure the "B/O Mode" (MSV-316) to the value "Heat Stage 3".

4.5.3.3 Configuring Analog Input Scaling `'40` `'50`

The analog inputs (AI1 and AI2) always measure a signal in milliamps. The raw milliamp reading can be scaled into any units desired in order to properly reflect the sensor measurement (engineering units). The scaling is configured independently for each analog input using the following BACnet objects (AIx represents AI1 or AI2):

- AIx Input Range (MSV-170 and AV-171): This sets the expected input range (sensor output) as either 0-20mA or 4-20mA.

- AIx Scaled Min (AV-161 and AV-163): This defines the sensor value when the output is at the minimum of the range (0 or 4 mA).

- AIx Scaled Max (AV-162 and AV-164): This defines the sensor value when the output is at the maximum of the range (20 mA).

There are two other objects associated with the analog inputs:

- AIx (AV-151 and AV-152): This is the raw input reading in milliamps.

- AIx Scaled (AV-181 and AV-182): This is the scaled representation in engineering units. The units property of this object is writable and can be written with the correct units for a more correct display on the status screens. This is currently only editable via Ubiquity Cloud or a third party BACnet configuration tool.

5   Advanced Feature Summary

The following is a list of advanced features with a description for each:

- **Setpoint Setback**: The DI Setpoint Setback feature allows the user to setback the effective heat and cool setpoint values based on the state of a DI. This causes the controller to increase the cool setpoint and decrease the heat setpoint by a predetermined amount and effectively create a setback response to an energy demand.

- **Economizer**: `'40`   `'50`   The Economizer makes use of outdoor air to assist in cooling the space and therefore reduces the need for mechanical cooling. This is also referred to as "free" cooling.

- **Service Status**: Service Status is defined as a state of the controller that requires action by the end user to resolve. The possible status conditions consist of the following:

    a. Discharge Limit Low: The Discharge Air Limit feature is enabled and the discharge air is below the low setpoint. Cooling is disabled until discharge air exceeds the low limit setpoint.

    b. Discharge Limit High: The Discharge Air Limit feature is enabled and the discharge air is above the high set point. Heating is disabled until discharge air falls below the high limit setpoint.

    c. Fan Proving Failure: The Fan Proving feature has detected a failure of the fan.

    d. DI Service: The state of a Digital Input is monitored, and when the DI becomes active, the service alert is also considered active. The message associated with this service is customizable by the user. If the controller has more than one DI, each DI may be independently configured as DI Service with a unique message.

    e. Check Filter: This is based on the state of a DI. It is a identical in function to the DI Service Status, but uses a predetermined message rather than the customizable message.

- **Fan Proving:** The Fan Proving feature allows the controller to safely shut down the system in the case where the fan fails to operate correctly, avoiding damage to the heating or cooling units. The input to this feature is an external sensor that is connected to a Digital Input (DI) indicating that the fan is operating (closed) or not (open).

- **External Time Clock**: The user has the option of configuring the TC relay output as an external time clock. In this mode, the relay is configured as being active when the unit is occupied and inactive when the unit is unoccupied.

- **Auto+Recirc**: This fan mode allows the user to satisfy building air recirculation requirements without running the fan continuously, therefore saving energy. The feature guarantees that the fan runs a certain percentage of time over a given period (both programmable), even if the fan operation due to the normal calls for heat and cool is insufficient.

- **Heating And Cooling Lockout**: The Outdoor Air Lockout feature provides the ability to prevent (lockout) activation of any heat stages or cool stages based on the current outdoor air temperature reading. This is useful when implement-

ing an energy savings policy or simply preventing a furnace from running in the summer, or a cooling compressor running in the winter.

- **Discharge Air Limits**: The Discharge Air Limit feature provides the ability to force a shutdown to prevent the heat or cool stages from operating based on the current discharge air temperature reading. This is useful for protecting equipment from damage to out of normal (or runaway) operation, while still allowing for an attempt to condition the space. When discharge air high or low limit is in effect, heating or cooling is disabled.

- **Offsets and Differentials**: Heating turns on when the space temperature falls below the heating setpoint minus the heating offset minus the heating differential. Heating turns off when the space temperature rises to the heating set-point minus the heating offset. Cooling turns on when the space temperature rises above the cooling setpoint plus the cooling offset plus the cooling differential. Cooling turns off when the space temperature falls to the cooling setpoint plus the cooling offset. Offsets effectively create new heating and cooling setpoints. The differential determines the temperature difference between the stage On point and the stage Off point, creating a hysteresis in the control output and preventing rapid cycling of equipment.

- **Equipment Protection Delays**: Each relay output (DO) has minimum on/off times to protect connected HVAC equip-ment from short cycling. These delays may be configured via the Minimum-On-Time and Minimum-Off-Time proper-ties of the binary output objects corresponding to each of the relays. By default minimum on & off times are two (2) minutes for all relays except for TC,B/O, and G, which are 30 seconds.

6   Checkout and Troubleshooting

6.1   CHECKOUT

1. Verify wiring. Wiring should be secure with no loose strands, and screws are tightened.

2. Install the cover on the UbiquiSTAT™. Make sure the cover is lined up properly and gently press the cover until it snaps into place. Make sure that the tether does not get pinched in the case.

3. Power up the UbiquiSTAT™. Ensure the stat powers up and screen lights up.

4. Ensure all programming has been completed correctly. See section 3 for initial setup instructions.

5. Navigate to the system test mode screen (Settings>Advanced>System Test Mode).

6. Turn on and off all outputs to check for proper operation.

7. Verify and test modulating outputs by incrementing and decrementing the milliamp output.

8. Run the heating test and watch the inputs for proper operation.

9. Run the cooling test and watch the inputs for proper operation.

If this unit is to be networked:

10. Verify the UbiquiSTAT™ has the proper network address, baud rate, mode, and device ID.

If the network is active, verify communication by confirming that the RS-485 link status is "Connected" on the network status screen (Status>Network Screen).

6.2   TROUBLESHOOTING

6.2.1 No Display

Remove cover and check for 24 VAC (22.8 to 27.6 VAC) on terminals labeled "+/- 24V". Replace the cover and check for proper fit. Ensure the two internal board connectors snap in place. For more information on removing the cover, see section 1.

6.2.2 Fan Does Not Come On

The fan is on whenever the fan symbol on the home screen is animated. If the fan should be on, but the symbol is not animated, check the fan and system modes. If the fan is off but the fan symbol is animated, check wiring. Connect a jumper between the "R" and "G" terminals to see if the fan comes on. If the fan comes on, the relay in the thermostat may

be faulty, or programming is incorrect. If the fan does not come on, check unit wiring to thermostat.

6.2.3 Heating or Cooling Does Not Come On

When the heating symbol is shown, at least one stage of heating is on, or an analog output is modulating for heat. When the cooling symbol is shown, at least one stage of cooling is on, or an analog output is modulating for cool.

If the heating or cooling is not coming on, but the thermostat is calling for heat or cool respectively, this is most likely a wiring issue. Check equipment wiring. Place a jumper across terminals "R" to "W1" and see if the heating comes on. Place a jumper across terminals "R" to "Y1" and see if the cooling comes on. This is to check for a mechanical relay failure.

If you feel that the heating or cooling should be on, but the corresponding symbol is not visible, check the following:

• System Mode

• Heating and Cooling Setpoints

• Offsets and Differentials

• Room Temperature is above the Cooling Setpoint or below Heating Setpoint.

• Outdoor Air Lockout Status

• Discharge Air Limit Status

6.2.4 Wrong Temperature Display

The temperature displayed on the screen is the temperature that is used to control heating and cooling. If this temperature reading is incorrect, the thermostat will not control properly.

If using the internal temperature sensor, check the calibration (see section 4.5.2.2).

If using a remote temperature sensor on the T1 terminals, check the room temperature source screen in the advanced settings to verify programming (see section 4.5.2.3) If the temperature reading is only slightly off, check calibration (see section 4.5.2.2). Otherwise, use the system test mode screen to verify ohm readings of the temperature sensor (see section 4.5.2.10).

6.2.5   Thermostat is Overcooling or Underheating

Overcooling or underheating can occur if the thermostat top is placed to close to an air vent, where air is allowed to enter the thermostat and cause erroneous temperature readings. To fix this problem the air stream from the vent will need to be redirected, or the thermostat will need to be relocated, or a remote sensor could be used.

Overcooling can also happen if the thermostat is mounted in direct sunlight. In this case, the thermostat will need to be relocated, or a remote sensor will need to be installed.

Overheating or undercooling can occur when air is allowed to flow into the thermostat from within the wall. If this occurs, seal the wall where the wires enter the thermostat.

6.2.6   Service Status Symbol is Visible

This indicates the HVAC Equipment requires service. See section 4.3 for more information on Service Status.

6.2.7   Outputs Will Not Shut Off

First check the room temperature and the setpoints and determine whether the output should be on. There are delays and minimum on and off times for the fan and heating and cooling stages. Also, check the status screen to verify that the outputs are on. If the heating or cooling outputs are shown to be on, programming will need to be verified. If the heating or cooling is shown to be off, the relays will need to be verified for proper operation or wiring will need to be checked. Turning the system mode to "Off" (Settings>System Mode) or resetting the thermostat will instantly turn all outputs off. The thermostat can be reset by touching and holding the status button for five seconds. Note that polarity of the relay outputs can be reversed such that the relays are Normally Closed. This causes the state of the relay to be closed (energized) when the status is "Off" and open (de-energized) when the status is "On". The polarity can be changed

using Ubiquity Cloud, TCS Insight or a third party BACnet configuration tool.

6.2.8   Analog Output Not Working Properly

Check wiring. A separate transformer should be used for the actuators and motors, and a separate transformer should be used for the thermostat. Check to make sure that the analog output is programmed correctly.

The Advanced Status Screen will show what the thermostat is trying to output. Compare this with the actual position on the heating or cooling device. The system test mode can be used to vary the analog outputs to test for proper operation of actuators (see section 4.5.2.10).

Two conditions must be met before the economizer analog output is allowed to modulate. First, there must be a call for cooling. Second, the outdoor air temperature must be less than its programmed setting. Once these two conditions are met the analog output will modulate according to its programming.

6.2.9   Both Heating and Cooling Are On

If this occurs, it could be that the thermostat is programmed for heat pump operation on a conventional system. If this is not the case, wiring must be checked. The thermostat is not designed to provide heating and cooling at the same time.

6.2.10   WiFi Connection

If communications are not indicated on the status display, verify the appropriate network is selected, and the password is correct. Check with the IT administrator to verify.

If network is not listed, investigate the WiFi network to verify the network strength and visibility. Local IT network administrator would provide the troubleshooting and correction.

7   Using TCS Insight with the UbiquiSTAT

7.1   INSTALL THE INSIGHT SOFTWARE

Download and install the latest version of Insight from www.tcsbasys.com in order to be compatible with the UbiquiSTAT.

7.2   CONNECT TO THE UBIQUISTAT

There are two methods to connect to the UbiquiSTAT outlined below:

7.2.1   Direct via USB

Connect Windows PC/laptop directly to the USB port that is accessible via the access window on the bottom of the UbiquiSTAT case with a "mini B" USB cable. The USB port is recessed within the window, so take care to properly align the cable when connecting.

Set the baud rate to the "UbiquiSTAT USB" option.

The UbiquiSTAT will appear as a COM port in the list (the same as when using a QD1010).

Note: There is no need to disconnect the RS-485 network or the TCS gateway (QD2040) when using the built-in USB port.

7.2.2   USB to RS-485 serial converter to RS-485 network

Caution: Disconnect any QD2040 on the RS-485 network if using this Insight configuration.

Note: This method maybe used to program all thermostats on a single network simultaneously.

First, connect PC/laptop to the USB-to-RS-485 serial converter (TCS QD1010), then wire the RS-485 network on the serial converter to the network on the UbiquiSTAT. The Communication Mode must be set to "TCSbus" on the UbiquiSTAT. The chosen baud rate in Insight must match the RS-485 network settings on the UbiquiSTAT.

A Windows driver may need to be installed for the PC/laptop to recognize and use the QD1010 or UbiquiSTAT USB. This driver is found and installed automatically by Windows Update when connected to the Internet.

7.3   SCHEDULES AND HOLIDAYS (AND BACNET)

The schedule editor tab in Insight edits a TCSbus representation of the schedule that is identical to that presented in the TCS SZ Series controllers, using start/stop times for each of the schedules A, B, C, D.

The BACnet representation of the schedule (BACnet object SCHED-800) is what is actually in effect and used by the controller. The two representations of the schedule are kept in sync as follows:

- When either representation of the schedule is written, a synchronization is schedule to occur approximately 10 seconds after the last write is received.

- If the TCSbus schedule was written, then this schedule is sync'd to BACnet.

- If the BACnet schedule is written, then it is sync'd to TCSbus.

- This is effectively: "Last schedule written wins."

Note that the schedule editor on the touchscreen edits the BACnet schedule and therefore saving this schedule will cause a sync to TCSbus.

The TCSbus weekly schedule is sync'd to the BACnet Weekly_Schedule property and the TCSbus Holiday Schedule is sync'd to the BACnet Exception_Schedule property of the schedule object.

Due to the limitations of the TCSbus holiday schedule, writes to the BACnet Exception_Schedule (via a third-party BACnet tool) are not sync'd to the TCSbus holiday schedule. Instead, when this happens, the TCSbus holiday schedule is cleared and the #Days field for the first range of Holiday 1 is set to equal the length of the Exception_Schedule array in order to provide some indication that there are holidays programmed in the device.

7.4   FIRMWARE UPGRADE

The UbiquiSTAT firmware may be upgraded using Insight.

To access the firmware upgrade feature, click the "Modules" menu item, then select "Advanced" and click the "Firmware Upgrade" option. This will cause the Firmware Upgrader tab to be displayed.

1. After discovering and selecting the UbiquiSTAT that is to be upgraded via the Network tab, click "Refresh" on the Firmware Upgrader tab to get the controller details.

2. Click "Browse" to locate the firmware image file that is to be upgraded

3. If everything checks out, then the "Start" button should be enabled. Click this button to start the upgrade. The upgrade may be canceled at any time by clicking the Cancel button

    Cancelling or otherwise interrupting the upgrade process will not cause any damage to the controller. The firmware image is buffered internally before the upgrade is performed, and the UbiquiSTAT will continue to operate normally during the process, except at the end during the re-start.

    During the upgrade process, the UbiquiSTAT should indicate that the firmware is being upgraded by a message on the home screen

4. The UbiquiSTAT display will go dark for up to 10 seconds at the end of the upgrade as it re-boots and loads the new firmware for the first time.

- The firmware files can be found at www.tcsbasys.com under the UbiquiSTAT product page

- Firmware upgrade via Insight is available for UbiquiSTATs that are already running firmware v1.01.0 and later. UbiquiSTATs with earlier firmware may also be upgraded, but must be done so using third party BACnet tools.

Please call TCS tech support for more information.

- Firmware may be "downgraded" by choosing an earlier firmware version, but there is a risk of losing all programming, depending on the compatibility of the two versions.

- This tool can only be used to upgrade firmware on the UbquiSTAT product family. The "Bootloader" feature can be used to upgrade firmware on the SZ series of TCS controllers.

- The firmware image must match the model of UbiquiSTAT. For example, it is not possible to upgrade a US4040 to a US4050.

7.5 BACKUP/RESTORE

- The Backup/Restore feature of Insight can backup and restore all of the user settings on the thermostat.

- This can be useful for preserving settings in case of accidental programming changes, stat replacement, or for quickly duplicating shared programming across many UbiquiSTATs

- Backup files cannot be ported across UbiquiSTAT models

- Backup files are not guaranteed to be compatible with firmware revision other than what was in the UbiquiSTAT at the time of the backup.

- This tool can only be used to upgrade firmware on the UbquiSTAT product family.

- Backup/restore via Insight is available for UbiquiSTATs that are already running firmware v1.01.0 and later. UbiquiSTATs with earlier firmware support this functionality, but must be done so using third party BACnet tools that support DM-BR-A.

8 Regulatory Information

FCC Compliance Statement (Part 15.19)

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.

FCC Interference Statement (Part 15.105 (b))

This equipment has been tested and found to comply with the limits for a 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, uses and can radiate radio frequency energy and, if not installed and used in ac-cordance 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.

BACnet Object List

The BACnet Object List provides a brief summary of each of the BACnet objects present in the UbiquiSTAT™. The table below defines each of the columns in the list.

Index	This number represents the order the object appears in the device object list and the internal BACnet explorer screen. It can be used for quick navigation on that screen.
Name	The name of the object (Name object property).
Description	The description of the object (Description object property).
Default Value	For objects that represent device programming and are stored persistently, the default value is the value assigned to the Present Value property when shipped from the factory or when factory defaults are loaded.
Object ID	The BACnet Object Identifier of the object. This consists of both the object type and object instance number. The object type is abbreviated as follows: - AI: Analog Input - AO: Analog Output - AV: Analog Value - BI: Binary Input - BO: Binary Output - BV: Binary Value - CAL: Calendar - CSV: Character String Value - FILE: File - MSV: Multi-State Value - PIV: Positive Integer Value - SCHED: Schedule
PV Access	Describes the read/write access permissions and physical storage location of the object's Present Value property, if applicable. - R/W: The Present Value property is readable and writable . - R: The Present Value property is read only. - RAM: The Present Value property is stored in RAM, and does not persist across a reset or loss of power. - NVM: The Present Value property is stored in Non-Volatile Memory (flash) and is retained across a reset or loss of power.
Object Profile	The object profile to which this object conforms. The profile determines which optional properties and behaviors are implemented in the object. Objects with the same profile can be expected to have the same optional properties and behaviors. The three numbers in parenthesis represent the value of the Object Profile property. Please see the UbiquiSTAT™ PICS document for a complete description of the various object profiles.
Additional Info	Lists any restrictions or possible state values that may be assigned to the Present Value property of the object.

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Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
	UbiquiSTAT	Advanced Application Thermostat			Device - Basic (496-8-1)		✓	✓	✓	✓
BV-803	External Time Clock	Indicates occupancy mode as determined by some external device		R/W (RAM)	Commandable (496-5-2)	States: (1) Occupied, (0) Unoccupied	✓	✓	✓	✓
SCH-800	Occupancy Schedule	Schedule determining setpoints in active use			Basic (496-17-1)		✓	✓	✓	✓
CAL-801	Schedule Calendar	Calendar for use by the occupancy schedule			Basic (496-6-1)		✓	✓	✓	✓
MSV-40	Default Setpoint Pair	Setpoint pair used by occupied override and other features	(2) Occ A	R/W (NVM)	Basic (496-19-1)	States: (1) Unocc, (2) Occ A, (3) Occ B, (4) Occ C, (5) Occ D	✓	✓	✓	✓
MSV-41	Active Setpoint Pair	Active Setpoint Pair		R (RAM)	Basic (496-19-1)	States: (1) Unoccupied, (2) Occupied A, (3) Occupied B, (4) Occupied C, (5) Occupied D	✓	✓	✓	✓
AV-71	Active Cool Setpoint	Currently active cool setpoint		R/W (RAM)	Commandable (496-2-2)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-70	Active Heat Setpoint	Currently active heat setpoint		R/W (RAM)	Commandable (496-2-2)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-53	A Cool Setpoint	A Cool Setpoint	75 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-52	A Heat Setpoint	A Heat Setpoint	70 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-55	B Cool Setpoint	B Cool Setpoint	75 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
AV-54	B Heat Setpoint	B Heat Setpoint	70 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-57	C Cool Setpoint	C Cool Setpoint	75 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-56	C Heat Setpoint	C Heat Setpoint	70 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-59	D Cool Setpoint	D Cool Setpoint	75 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-58	D Heat Setpoint	D Heat Setpoint	70 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-51	Unoccupied Cool Setpoint	Unoccupied Cool Setpoint	80 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-50	Unoccupied Heat Setpoint	Unoccupied Heat Setpoint	60 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-91	User Setpoint Adjust Limit	User Setpoint Adjust Limit	5 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 20 Deg F	✓	✓	✓	✓
MSV-94	User Setpoint Adjust Mode	User Setpoint Adjust Mode	(1) Hold	R/W (NVM)	Basic (496-19-1)	States: (1) Hold, (2) Timer	✓	✓	✓	✓
PIV-92	User Setpoint Adjust Timeout	User Setpoint Adjust Timeout	60 min	R/W (NVM)	Basic (496-48-1)	Range: 1 to 120 min	✓	✓	✓	✓
AV-90	User Setpoint Adjust	User Setpoint Adjust		R/W (RAM)	Basic (496-2-1)	Range: -20 to 20 Deg F	✓	✓	✓	✓
PIV-93	User Setpoint Adjust Timer	User Setpoint Adjust Timer		R (RAM)	Basic (496-48-1)	Range: 0 to 7200 sec	✓	✓	✓	✓
BV-950	Cool Stage 1 Enable	Cool Stage 1 Enable	(1) Enabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✓	✓	✓	✓
AV-951	Cool Stage 1 Offset	Cool Stage 1 Offset	0 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F	✓	✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
AV-952	Cool Stage 1 Differential	Cool Stage 1 Differential	1 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F	✓	✓	✓	✓
PIV-953	Cool Stage 1 Next Stage Enable Delay	Delay before next stage is allowed to become active	120 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 3600 sec	✓	✓	✓	✓
BV-960	Cool Stage 2 Enable	Cool Stage 2 Enable	(1) Enabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled		✓	✓	✓
AV-961	Cool Stage 2 Offset	Cool Stage 2 Offset	1 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F		✓	✓	✓
AV-962	Cool Stage 2 Differential	Cool Stage 2 Differential	1 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F		✓	✓	✓
PIV-963	Cool Stage 2 Next Stage Enable Delay	Delay before next stage is allowed to become active	120 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 3600 sec		✓	✓	✓
BV-970	Cool Stage 3 Enable	Cool Stage 3 Enable	(1) Enabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled		✓	✓	✓
AV-971	Cool Stage 3 Offset	Cool Stage 3 Offset	2 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F		✓	✓	✓
AV-972	Cool Stage 3 Differential	Cool Stage 3 Differential	1 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F		✓	✓	✓
PIV-973	Cool Stage 3 Next Stage Enable Delay	Delay before next stage is allowed to become active	120 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 3600 sec		✓	✓	✓
BV-980	Cool Stage 4 Enable	Cool Stage 4 Enable	(1) Enabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled		✓	✓	✓
AV-981	Cool Stage 4 Offset	Cool Stage 4 Offset	3 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F		✓	✓	✓
AV-982	Cool Stage 4 Differential	Cool Stage 4 Differential	1 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F		✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
PIV-983	Cool Stage 4 Next Stage Enable Delay	Delay before next stage is allowed to become active	120 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 3600 sec		✓	✓	✓
BV-900	Heat Stage 1 Enable	Heat Stage 1 Enable	(1) Enabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✓	✓	✓	✓
AV-901	Heat Stage 1 Offset	Heat Stage 1 Offset	0 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F	✓	✓	✓	✓
AV-902	Heat Stage 1 Differential	Heat Stage 1 Differential	1 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F	✓	✓	✓	✓
PIV-903	Heat Stage 1 Next Stage Enable Delay	Delay before next stage is allowed to become active	120 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 3600 sec	✓	✓	✓	✓
BV-910	Heat Stage 2 Enable	Heat Stage 2 Enable	(1) Enabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✓	✓	✓	✓
AV-911	Heat Stage 2 Offset	Heat Stage 2 Offset	1 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F	✓	✓	✓	✓
AV-912	Heat Stage 2 Differential	Heat Stage 2 Differential	1 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F	✓	✓	✓	✓
PIV-913	Heat Stage 2 Next Stage Enable Delay	Delay before next stage is allowed to become active	120 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 3600 sec	✓	✓	✓	✓
BV-920	Heat Stage 3 Enable	Heat Stage 3 Enable	(1) Enabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled		✓	✓	✓
AV-921	Heat Stage 3 Offset	Heat Stage 3 Offset	2 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F		✓	✓	✓
AV-922	Heat Stage 3 Differential	Heat Stage 3 Differential	1 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F		✓	✓	✓
PIV-923	Heat Stage 3 Next Stage Enable Delay	Delay before next stage is allowed to become active	120 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 3600 sec		✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
BV-930	Heat Stage 4 Enable	Heat Stage 4 Enable	(1) Enabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled		✔	✔	✔
AV-931	Heat Stage 4 Offset	Heat Stage 4 Offset	3 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F		✔	✔	✔
AV-932	Heat Stage 4 Differential	Heat Stage 4 Differential	1 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F		✔	✔	✔
PIV-933	Heat Stage 4 Next Stage Enable Delay	Delay before next stage is allowed to become active	120 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 3600 sec		✔	✔	✔
AV-1003	Cool Error	Amount of cooling needed. A value of 0 indicates cooling satisfied		R (RAM)	Control Error (496-2-4)	Range: 0 to 400 Deg F	✔	✔	✔	✔
AV-1002	Heat Error	Amount of heating needed. A value of 0 indicates heating satisfied		R (RAM)	Control Error (496-2-4)	Range: 0 to 400 Deg F	✔	✔	✔	✔
BV-850	P+I Enable	Enables P+I feature on relay stage control	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✔	✔	✔	✔
PIV-851	P+I Rate	Rate of the I component in Seconds/Degree, decrease for faster response	300 sec	R/W (NVM)	Basic (496-48-1)	Range: 1 to 3600 sec	✔	✔	✔	✔
AV-820	Smart Recovery Cool Rate	Rate at which the Smart Recovery adjusts the cooling setpoint in Degrees/Hour, prior to occupied	4 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 20 Deg F	✔	✔	✔	✔

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
AV-821	Smart Recovery Heat Rate	Rate at which the Smart Recovery adjusts the heating setpoint in Degrees/Hour, prior to occupied	4 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 20 Deg F	✓	✓	✓	✓
AV-822	Smart Recovery Cool Delta	Current adjustment applied to cooling by Smart Recovery		R (RAM)	Basic (496-2-1)	Range: 0 to 200 Deg F	✓	✓	✓	✓
AV-823	Smart Recovery Heat Delta	Current adjustment applied to heating by Smart Recovery		R (RAM)	Basic (496-2-1)	Range: 0 to 200 Deg F	✓	✓	✓	✓
BV-824	Smart Recovery A Enable	Smart Recovery A Enable	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✓	✓	✓	✓
BV-825	Smart Recovery B Enable	Smart Recovery B Enable	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✓	✓	✓	✓
BV-826	Smart Recovery C Enable	Smart Recovery C Enable	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✓	✓	✓	✓
BV-827	Smart Recovery D Enable	Smart Recovery D Enable	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✓	✓	✓	✓
MSV-1100	Active Fan Mode	Active Fan Mode		R (RAM)	Basic (496-19-1)	States: (1) Auto, (2) On, (3) Cool, (4) Auto + Re-circ	✓	✓	✓	✓
MSV-1101	Occupied Fan Mode	Occupied Fan Mode	(1) Auto	R/W (NVM)	Basic (496-19-1)	States: (1) Auto, (2) On, (3) Cool, (4) Auto + Re-circ	✓	✓	✓	✓
MSV-1102	Unoccupied Fan Mode	Unoccupied Fan Mode	(1) Auto	R/W (NVM)	Basic (496-19-1)	States: (1) Auto, (2) On, (3) Cool, (4) Auto + Re-circ	✓	✓	✓	✓
PIV-1105	Fan Post-Conditioning Runtime for Heat	How long the fan runs after all heat stages become inactive	60 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 3600 sec	✓	✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
PIV-1106	Fan Post-Conditioning Runtime for Cool	How long the fan runs after all cool stages become inactive	60 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 3600 sec	✓	✓	✓	✓
BV-1110	Fan Proving Input Status	Fan Proving Input Status		R/W (RAM)	Commandable (496-5-2)	States: (1) Active, (0) Inactive	✓	✓	✓	✓
BV-1111	Fan Proving Failure Status	Indicates whether the fan has failed proving. Write to inactive to reset fan proving		R/W (RAM)	Basic (496-5-1)	States: (1) Failed, (0) Ok	✓	✓	✓	✓
PIV-1112	Fan Proving Delay	Delay after fan is activated before proving is performed	30 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 600 sec	✓	✓	✓	✓
PIV-1113	Fan Proving Recovery Attempts	Fan Proving Recovery Attempts		R/W (NVM)	Basic (496-48-1)	Range: 0 to 10	✓	✓	✓	✓
PIV-1114	Fan Proving Recovery Delay	Delay between each recovery attempt after a proving failure	600 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 43200 sec	✓	✓	✓	✓
PIV-1115	Fan Recirc Period	Period over which the recirculation is calculated	20 min	R/W (NVM)	Basic (496-48-1)	Range: 10 to 60 min	✓	✓	✓	✓
PIV-1116	Fan Recirc Occupied Percentage	Minimum duty cycle for fan recirculation when occupied	5.00%	R/W (NVM)	Basic (496-48-1)	Range: 0 to 100 %	✓	✓	✓	✓
PIV-1117	Fan Recirc Unoccupied Percentage	Minimum duty cycle for fan recirculation when unoccupied	0.00%	R/W (NVM)	Basic (496-48-1)	Range: 0 to 100 %	✓	✓	✓	✓
MSV-1001	Thermostat Type	Thermostat Type	(1) Conventional	R/W (NVM)	Basic (496-19-1)	States: (1) Conventional, (2) Heat Pump	✓	✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
MSV-1000	System Mode	System Mode	(2) Auto	R/W (NVM)	Basic (496-19-1)	States: (1) Off, (2) Auto, (3) Heat, (4) Cool, (5) Emergency Heat, (6) Off + Fan Recirc	✔	✔	✔	✔
MSV-1005	Active System Mode	System mode used by control, network commandable. Program using MSV-1000		R/W (RAM)	Commandable (496-19-2)	States: (1) Off, (2) Auto, (3) Heat, (4) Cool, (5) Emergency Heat, (6) Off + Fan Recirc	✔	✔	✔	✔
PIV-1010	Power-Up Delay	Delay after power-up before any control is performed	10 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 3600 sec	✔	✔	✔	✔
PIV-1011	Reversing Valve Delay	Delay between reversing valve changing state and compressor running	30 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 120 sec	✔	✔	✔	✔
MSV-1004	System State	System State		R (RAM)	Basic (496-19-1)	States: (1) System Off, (2) Disabled, (3) Idle, (4) Heating, (5) Cooling, (6) Heating Lockout, (7) Cooling Lockout	✔	✔	✔	✔
MSV-700	Occupancy State	Occupancy State		R/W (RAM)	Commandable (496-19-2)	States: (1) Unoccupied, (2) Occupied	✔	✔	✔	✔
MSV-701	Occupancy Override Mode	Allows user to override occupancy state	(3) Unoccupied Only	R/W (NVM)	Basic (496-19-1)	States: (1) Disabled, (2) Enabled, (3) Unoccupied Only	✔	✔	✔	✔
PIV-703	Occupancy State Override Time	Duration of timed occupancy state override	180 min	R/W (NVM)	Basic (496-48-1)	Range: 0 to 10080 min	✔	✔	✔	✔

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
PIV-704	Occupied Transition Delay	Delay before scheduled transition to occupied occupancy state	0 sec	R/W (NVM)	Basic (496-48-1)	Range: 0 to 3600 sec	✓	✓	✓	✓
MSV-705	Occupancy Override State	Occupancy Override State		R (RAM)	Basic (496-19-1)	States: (1) OFF, (2) ON (Timed), (3) ON (Hold)	✓	✓	✓	✓
PIV-706	Occupancy Override Timer	Time remaining when override timer is active		R (RAM)	Basic (496-48-1)	Range: 0 to 604800 sec	✓	✓	✓	✓
BV-707	Momentary Occupancy Override	Momentary Occupancy Override		R/W (RAM)	Commandable (496-5-2)	States: (1) Active, (0) Inactive	✓	✓	✓	✓
BV-708	External Occupancy Override	Continuous override to occupied occupancy state		R/W (RAM)	Commandable (496-5-2)	States: (1) Active, (0) Inactive	✓	✓	✓	✓
AI-100	Internal Sensor Input	Built-in temperature input, includes user calibration		R (RAM)	Digital Temp Input (496-0-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-110	Internal Sensor User Calibration	Built-in temperature user calibration	0 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -20 to 20 Deg F	✓	✓	✓	✓
AI-101	T1 RTD Input	T1 terminal RTD temperature input, includes user calibration		R (RAM)	RTD Input (496-0-2)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-111	T1 RTD User Calibration	T1 RTD User Calibration	0 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -20 to 20 Deg F	✓	✓	✓	✓
AI-102	T2 RTD Input	T2 terminal RTD temperature input, includes user calibration		R (RAM)	RTD Input (496-0-2)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-112	T2 RTD User Calibration	T2 RTD User Calibration	0 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -20 to 20 Deg F	✓	✓	✓	✓
AI-103	T3 RTD Input	T3 terminal RTD temperature input, includes user calibration		R (RAM)	RTD Input (496-0-2)	Range: -40 to 160 Deg F	✓	✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
AV-113	T3 RTD User Calibration	T3 RTD User Calibration	0 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -20 to 20 Deg F	✓	✓	✓	✓
AI-151	AI1	Analog Input 1		R (RAM)	Ammeter Input (496-0-3)	Range: 0 to 20 mA			✓	✓
MSV-170	AI1 Input Range	AI1 Input Range	(1) 4 - 20 mA	R/W (NVM)	Basic (496-19-1)	States: (1) 4 - 20 mA, (2) 0 - 20 mA			✓	✓
AV-161	AI1 Scaled Min	AI1 Scaled Min		R/W (NVM)	Basic (496-2-1)	Range: -1e+06 to 1e+06			✓	✓
AV-162	AI1 Scaled Max	AI1 Scaled Max		R/W (NVM)	Basic (496-2-1)	Range: -1e+06 to 1e+06			✓	✓
AV-181	AI1 Scaled	Analog Input 1 in engineering units		R (RAM)	Ammeter Scaled (496-2-3)	Range: 0 to 100 %			✓	✓
AI-152	AI2	Analog Input 2		R (RAM)	Ammeter Input (496-0-3)	Range: 0 to 20 mA				✓
MSV-171	AI2 Input Range	AI2 Input Range	(1) 4 - 20 mA	R/W (NVM)	Basic (496-19-1)	States: (1) 4 - 20 mA, (2) 0 - 20 mA				✓
AV-163	AI2 Scaled Min	AI2 Scaled Min		R/W (NVM)	Basic (496-2-1)	Range: -1e+06 to 1e+06				✓
AV-164	AI2 Scaled Max	AI2 Scaled Max		R/W (NVM)	Basic (496-2-1)	Range: -1e+06 to 1e+06				✓
AV-182	AI2 Scaled	Analog Input 2 in engineering units		R (RAM)	Ammeter Scaled (496-2-3)	Range: 0 to 100 %				✓
MSV-120	Space Temperature Source	Space Temperature Source	(1) Internal Temperature	R/W (NVM)	Basic (496-19-1)	States: (1) Internal Temperature, (2) T1, (3) T1 & Internal Temp. Averaging	✓	✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
AV-129	Space Temperature Averaging Weight	Weight given to the Internal Temperature when averaging	50.00%	R/W (NVM)	Basic (496-2-1)	Range: 0 to 100 %	✓	✓	✓	✓
MSV-121	Mixed Air Temperature Source	Mixed Air Temperature Source	(1) None	R/W (NVM)	Basic (496-19-1)	States: (1) None, (2) T1			✓	✓
MSV-122	Space Carbon Dioxide Source	Space Carbon Dioxide Source	(1) None	R/W (NVM)	Basic (496-19-1)	States: (1) None, (2) AI1, (3) AI2			✓	✓
MSV-123	Space Relative Humidity Source	Space Relative Humidity Source	(1) None	R/W (NVM)	Basic (496-19-1)	States: (1) None, (2) AI1, (3) AI2				✓
AV-130	Space Temperature	Space Temperature		R/W (RAM)	Commandable (496-2-2)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-131	Discharge Air Temperature	Discharge Air Temperature		R/W (RAM)	Commandable (496-2-2)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-132	Outdoor Air Temperature	Outdoor Air Temperature		R/W (RAM)	Commandable (496-2-2)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-133	Mixed Air Temperature	Mixed Air Temperature		R/W (RAM)	Commandable (496-2-2)	Range: -40 to 160 Deg F			✓	✓
AV-134	Space Carbon Dioxide	Space Carbon Dioxide		R/W (RAM)	Commandable (496-2-2)	Range: 0 to 10000 ppm			✓	✓
AV-135	Space Relative Humidity	Space Relative Humidity		R/W (RAM)	Commandable (496-2-2)	Range: 0 to 100 % RH				✓
BI-251	DI1	Digital Input 1		R (RAM)	Digital Input (496-3-1)	States: (1) On, (0) Off	✓	✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
MSV-261	DI1 Mode	Digital Input 1 Mode	(1) Monitor	R/W (NVM)	Basic (496-19-1)	States: (1) Monitor, (2) Filter Service, (3) Service, (4) Fan Proving, (5) Economizer Enable, (6) AquaStat, (7) Momentary Occupancy Override, (8) External Occupancy Override, (9) External Time Clock, (10) Setpoint Setback	✓	✓	✓	✓
BI-252	DI2	Digital Input 2		R (RAM)	Digital Input (496-3-1)	States: (1) On, (0) Off	✓	✓	✓	✓
MSV-262	DI2 Mode	Digital Input 2 Mode	(1) Monitor	R/W (NVM)	Basic (496-19-1)	States: (1) Monitor, (2) Filter Service, (3) Service, (4) Fan Proving, (5) Economizer Enable, (6) AquaStat, (7) Momentary Occupancy Override, (8) External Occupancy Override, (9) External Time Clock, (10) Setpoint Setback	✓	✓	✓	✓
BI-253	DI3	Digital Input 3		R (RAM)	Digital Input (496-3-1)	States: (1) On, (0) Off	✓	✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
MSV-263	DI3 Mode	Digital Input 3 Mode	(1) Monitor	R/W (NVM)	Basic (496-19-1)	States: (1) Monitor, (2) Filter Service, (3) Service, (4) Fan Proving, (5) Economizer Enable, (6) AquaStat, (7) Momentary Occupancy Override, (8) External Occupancy Override, (9) External Time Clock, (10) Setpoint Setback	✓	✓	✓	✓
BO-301	W1	Heat 1 / Auxiliary Heat 1 relay		R/W (RAM)	Relay (496-4-1)	States: (1) On, (0) Off	✓	✓	✓	✓
BO-302	W2	Heat 2 / Auxiliary Heat 2 relay		R/W (RAM)	Relay (496-4-1)	States: (1) On, (0) Off		✓	✓	✓
BO-303	Y1	Cool 1 / Compressor 1 relay		R/W (RAM)	Relay (496-4-1)	States: (1) On, (0) Off	✓	✓	✓	✓
BO-304	Y2	Cool 2 / Compressor 2 relay		R/W (RAM)	Relay (496-4-1)	States: (1) On, (0) Off		✓	✓	✓
BO-305	G	Fan relay		R/W (RAM)	Relay (496-4-1)	States: (1) On, (0) Off	✓	✓	✓	✓
BO-306	B/O	Heat pump reversing valve relay, additional stages		R/W (RAM)	Relay (496-4-1)	States: (1) On, (0) Off	✓	✓	✓	✓
MSV-316	B/O Mode	B/O relay mode	(1) Off	R/W (NVM)	Basic (496-19-1)	States: (1) Off, (2) Reversing Valve, (3) Heat Stage 3, (4) Cool Stage 3, (5) Heat Stage 4, (6) Cool Stage 4	✓	✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
BO-307	TC	Time clock output relay, additional stages		R/W (RAM)	Relay (496-4-1)	States: (1) On, (0) Off	✔	✔	✔	✔
MSV-317	TC Mode	TC relay mode	(1) Off	R/W (NVM)	Basic (496-19-1)	States: (1) Off, (2) Time Clock, (3) Heat Stage 3, (4) Cool Stage 3, (5) Heat Stage 4, (6) Cool Stage 4	✔	✔	✔	✔
AO-200	AO1	Analog Output 1		R/W (RAM)	Current Generator (496-1-1)	Range: 0 to 20 mA	✔		✔	✔
AV-240	AO1 Percentage	Analog Output 1 percentage		R/W (RAM)	Commandable (496-2-2)	Range: 0 to 100 %	✔		✔	✔
MSV-210	AO1 Mode	Analog Output 1 mode	(1) Off	R/W (NVM)	Basic (496-19-1)	States: (1) Off, (2) Heat/Cool/Aquastat, (3) OA Damper, (4) Midpoint	✔		✔	✔
MSV-220	AO1 Action	Analog Output 1 action	(1) Direct	R/W (NVM)	Basic (496-19-1)	States: (1) Direct, (2) Reverse	✔		✔	✔
MSV-230	AO1 Range	Analog Output 1 range	(1) 4 - 20 mA	R/W (NVM)	Basic (496-19-1)	States: (1) 4 - 20 mA, (2) 0 - 20 mA	✔		✔	✔
AO-201	AO2	Analog Output 2		R/W (RAM)	Current Generator (496-1-1)	Range: 0 to 20 mA	✔			✔
AV-241	AO2 Percentage	Analog Output 2 percentage		R/W (RAM)	Commandable (496-2-2)	Range: 0 to 100 %	✔			✔
MSV-211	AO2 Mode	Analog Output 2 mode	(1) Off	R/W (NVM)	Basic (496-19-1)	States: (1) Off, (2) Heat/Cool/Aquastat, (3) OA Damper, (4) Midpoint	✔			✔
MSV-221	AO2 Action	Analog Output 2 action	(1) Direct	R/W (NVM)	Basic (496-19-1)	States: (1) Direct, (2) Reverse	✔			✔

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
MSV-231	AO2 Range	Analog Output 2 range	(1) 4 - 20 mA	R/W (NVM)	Basic (496-19-1)	States: (1) 4 - 20 mA, (2) 0 - 20 mA	✔			✔
MSV-1400	AO1 H/C/A Mode	Analog Output 1 Heat/Cool/Aquastat Mode	(1) Heat	R/W (NVM)	Basic (496-19-1)	States: (1) Heat, (2) Cool, (3) Aquastat	✔			✔
AV-1410	AO1 H/C/A Min Position	Analog Output 1 Heat/Cool/Aquastat minimum position	0.00%	R/W (NVM)	Basic (496-2-1)	Range: 0 to 100 %	✔			✔
AV-1420	AO1 H/C/A Max Position	Analog Output 1 Heat/Cool/Aquastat maximum position	100.00%	R/W (NVM)	Basic (496-2-1)	Range: 0 to 100 %	✔			✔
MSV-1430	AO1 H/C/A Unoccupied Mode	Analog Output 1 Heat/Cool/Aquastat unoccupied mode	(1) Modulate	R/W (NVM)	Basic (496-19-1)	States: (1) Modulate, (2) Fixed	✔		✔	✔
AV-1440	AO1 H/C/A Unoccupied Fixed Output	Analog Output 1 Heat/Cool/Aquastat unoccupied fixed output	100.00%	R/W (NVM)	Basic (496-2-1)	Range: 0 to 100 %	✔		✔	✔
MSV-1401	AO2 H/C/A Mode	Analog Output 2 Heat/Cool/Aquastat Mode	(1) Heat	R/W (NVM)	Basic (496-19-1)	States: (1) Heat, (2) Cool, (3) Aquastat	✔			✔
AV-1411	AO2 H/C/A Min Position	Analog Output 2 Heat/Cool/Aquastat minimum position	0.00%	R/W (NVM)	Basic (496-2-1)	Range: 0 to 100 %	✔			✔
AV-1421	AO2 H/C/A Max Position	Analog Output 2 Heat/Cool/Aquastat maximum position	100.00%	R/W (NVM)	Basic (496-2-1)	Range: 0 to 100 %	✔			✔
MSV-1431	AO2 H/C/A Unoccupied Mode	Analog Output 2 Heat/Cool/Aquastat unoccupied mode	(1) Modulate	R/W (NVM)	Basic (496-19-1)	States: (1) Modulate, (2) Fixed	✔			✔
AV-1441	AO2 H/C/A Unoccupied Fixed Output	Analog Output 2 Heat/Cool/Aquastat unoccupied fixed output	100.00%	R/W (NVM)	Basic (496-2-1)	Range: 0 to 100 %	✔			✔

APPENDIX A

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
MSV-1450	Aquastat Mode	Aquastat method for determining whether to heat or cool	(1) Analog	R/W (NVM)	Basic (496-19-1)	States: (1) Analog, (2) Digital	✓			✓
AV-1451	Aquastat Analog Setpoint	Setpoint used by analog aquastat mode	75 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓			✓
BV-1452	Aquastat Digital Control	Aquastat Digital Control		R/W (RAM)	Commandable (496-5-2)	States: (1) Heat, (0) Cool	✓			✓
AV-1600	Heat Analog Output	Heat Analog Output		R (RAM)	Basic (496-2-1)	Range: 0 to 100 %	✓			✓
AV-1601	Cool Analog Output	Cool Analog Output		R (RAM)	Basic (496-2-1)	Range: 0 to 100 %	✓			✓
AV-1610	Heat Prop Band	Proportional band for modulating heat	5 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F	✓			✓
AV-1611	Cool Prop Band	Proportional band for modulating cool	5 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F	✓			✓
AV-1602	AO Heat Setpoint Offset	Offset subtracted from the heat setpoint for modulating control	0 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 25 Deg F	✓			✓
AV-1603	AO Cool Setpoint Offset	Offset added to the cool setpoint for modulating control	0 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 25 Deg F	✓			✓
BV-1604	Heat Discharge Reset Enable	Heat Discharge Reset Enable	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✓			✓
AV-1606	Heat Discharge Reset Ratio	Heat Discharge Reset Ratio		R/W (NVM)	Basic (496-2-1)	Range: 0 to 10	✓			✓
AV-1608	Heat Discharge Reset Base Setpoint	Heat Discharge Reset Base Setpoint	75 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓			✓
AV-1612	Heat Discharge Reset Active Setpoint	Heat Discharge Reset Active Setpoint		R (RAM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓			✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
BV-1605	Cool Discharge Reset Enable	Cool Discharge Reset Enable	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✓			✓
AV-1607	Cool Discharge Reset Ratio	Cool Discharge Reset Ratio		R/W (NVM)	Basic (496-2-1)	Range: 0 to 10	✓			✓
AV-1609	Cool Discharge Reset Base Setpoint	Cool Discharge Reset Base Setpoint	60 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓			✓
AV-1613	Cool Discharge Reset Active Setpoint	Cool Discharge Reset Active Setpoint		R (RAM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓			✓
MSV-1622	Heat Discharge Tempering Mode	Heat Discharge Tempering Mode	(1) Off	R/W (NVM)	Basic (496-19-1)	States: (1) Off, (2) On, (3) Occupied Only	✓			✓
AV-1620	Heat Discharge Tempering Setpoint	Heat Discharge Tempering Setpoint	60 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓			✓
AV-1624	Heat Discharge Tempering Prop Band	Proportional band for heat discharge tempering	10 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F	✓			✓
AV-1626	Heat Discharge Tempering Output	Heat Discharge Tempering Output		R (RAM)	Basic (496-2-1)	Range: 0 to 100 %	✓			✓
MSV-1623	Cool Discharge Tempering Mode	Cool Discharge Tempering Mode	(1) Off	R/W (NVM)	Basic (496-19-1)	States: (1) Off, (2) On, (3) Occupied Only	✓			✓
AV-1621	Cool Discharge Tempering Setpoint	Cool Discharge Tempering Setpoint	80 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓			✓
AV-1625	Cool Discharge Tempering Prop Band	Proportional band used by cool discharge tempering	10 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F	✓			✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
AV-1627	Cool Discharge Tempering Output	Cool Discharge Tempering Output		R (RAM)	Basic (496-2-1)	Range: 0 to 100 %	✔			✔
AV-1500	Outdoor Damper Min Position	Outdoor Damper Min Position	0.00%	R/W (NVM)	Basic (496-2-1)	Range: 0 to 100 %			✔	✔
MSV-1501	Outdoor Damper Control Source	Outdoor Damper Control Source	(1) Discharge Air	R/W (NVM)	Basic (496-19-1)	States: (1) Discharge Air, (2) Mixed Air			✔	✔
AV-1510	Economizer Output	Economizer Output		R (RAM)	Basic (496-2-1)	Range: 0 to 100 %			✔	✔
MSV-1511	Economizer Mode	Determines when economizer is activated	(3) Drybulb Setpoint	R/W (NVM)	Basic (496-19-1)	States: (1) Off, (2) Digital Input, (3) Drybulb Setpoint, (4) Drybulb Compare			✔	✔
AV-1512	Economizer Setpoint	Economizer Setpoint	55 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F			✔	✔
AV-1513	Economizer Prop Band	Proportional band for economizer	10 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F			✔	✔
AV-1514	Economizer OA Drybulb Setpoint	Economizer Outdoor Drybulb Setpoint	60 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F			✔	✔
AV-1515	Economizer OA Drybulb Compare Delta	Difference between outdoor and space temperature before economizer is activated	10 Deg F	R/W (NVM)	Basic (496-2-1)	Range: 0 to 50 Deg F			✔	✔
BV-1516	Economizer Unoccupied Enable	Economizer Unoccupied Enable	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled			✔	✔
BV-1517	Economizer DI Enable	Economizer enable for Digital Input economizer mode		R/W (RAM)	Commandable (496-5-2)	States: (1) Enabled, (0) Disabled			✔	✔
BV-1518	Economizer Free Cooling Available	Indicates economizer can provide cooling		R (RAM)	Basic (496-5-1)	States: (1) True, (0) False			✔	✔

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
BV-1519	Economizer Enabled	Indicates economizer is currently providing cooling		R (RAM)	Basic (496-5-1)	States: (1) True, (0) False			✔	✔
AV-1530	Demand Ventilation Output	Demand Ventilation Output		R (RAM)	Basic (496-2-1)	Range: 0 to 100 %			✔	✔
BV-1531	Demand Ventilation Enable	Demand Ventilation Enable	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled			✔	✔
AV-1532	Demand Ventilation Setpoint	Demand ventilation CO2 setpoint	900 ppm	R/W (NVM)	Basic (496-2-1)	Range: 0 to 1000 ppm			✔	✔
AV-1533	Demand Ventilation Prop Band	Demand ventilation CO2 proportional band	200 ppm	R/W (NVM)	Basic (496-2-1)	Range: 0 to 1000 ppm			✔	✔
BV-1534	Demand Ventilation LL Override Enable	Allows demand ventilation to override discharge air low limit	(1) Enabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled			✔	✔
AV-1540	OA Damper Discharge Air LL Output	OA Damper Discharge Air Low Limit Output		R (RAM)	Basic (496-2-1)	Range: 0 to 100 %			✔	✔
BV-1541	OA Damper Discharge Air LL Enable	OA Damper Discharge Air Low Limit Enable	(1) Enabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled			✔	✔
AV-1542	OA Damper Discharge Air LL Setpoint	Setpoint at which the OA damper is fully closed	40 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F			✔	✔
AV-1550	Pre-occ Purge Output	Pre-occupancy Purge Output		R (RAM)	Basic (496-2-1)	Range: 0 to 100 %			✔	✔
BV-1551	Pre-occ Purge Enable	Pre-occupancy Purge Enable	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled			✔	✔

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
AV-1552	Pre-occ Purge OA Damper Position	Pre-occupancy Purge OA Damper Position	25.00%	R/W (NVM)	Basic (496-2-1)	Range: 0 to 100 %			✓	✓
PIV-1553	Pre-occ Purge Duration	Duration prior to occupied occupancy state when feature is active	60 min	R/W (NVM)	Basic (496-48-1)	Range: 0 to 240 min			✓	✓
AV-1700	Midpoint Bias	Percent of output allocated to heating for midpoint control.	50.00%	R/W (NVM)	Basic (496-2-1)	Range: 0 to 100 %	✓			✓
BSV-1120	Limit and Lockout Status	Limit and Lockout Status		R (RAM)	Basic (496-39-1)	Bits: (1) OA Lockout Heat, (2) OA Lockout Cool, (3) DA Limit Heat, (4) DA Limit Cool, (5) LL Changeover	✓	✓	✓	✓
BV-1130	Outdoor Air Lockout Enable	Outdoor Air Lockout Enable	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✓	✓	✓	✓
AV-1132	Outdoor Air Lockout Cool Setpoint	Mechanical cooling is not allowed when outdoor air is below this value	55 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-1131	Outdoor Air Lockout Heat Setpoint	Heating is not allowed when outdoor air is above this value	70 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
BV-1140	Discharge Air Limit Enable	Discharge Air Limit Enable	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✓	✓	✓	✓
AV-1142	Discharge Air Limit Cool Setpoint	Cooling is not allowed when discharge air is below this value	40 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-1141	Discharge Air Limit Heat Setpoint	Heating is not allowed when discharge air is above this value	140 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
BV-1150	Low Limit Changeover Enable	Outdoor air low limit changeover enable (heat pump only)	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✓	✓	✓	✓
AV-1151	Low Limit Changeover Setpoint	Compressors are disabled below this outdoor air setpoint (heat pump only)	20 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
BV-1250	DI Setpoint Setback State	DI Setpoint Setback State		R/W (RAM)	Commandable (496-5-2)	States: (1) Active, (0) Inactive	✓	✓	✓	✓
BV-1251	DI Setpoint Setback Input	DI Setpoint Setback Input		R (RAM)	Commandable (496-48-1)	States: (1) Active, (0) Inactive	✓	✓	✓	✓
PIV-603	RS-485 Address	RS-485 Address	0	R/W (NVM)	Basic (496-48-1)	Range: 0 to 127	✓	✓	✓	✓
MSV-601	RS-485 Baud Rate3	RS-485 Baud Rate3	(3) 38,400	R/W (NVM)	Basic (496-19-1)	States: (1) 9,600, (2) 19,200, (3) 38,400, (4) 57,600, (5) 76,800, (6) 115,200	✓	✓	✓	✓
MSV-602	RS-485 Mode	Communication Protocol used on the RS-485 bus	(2) BACnet MS/TP	R/W (NVM)	Basic (496-19-1)	States: (1) TCSbus, (2) BACnet MS/TP	✓	✓	✓	✓
BV-1800	Residential Mode Enable	Residential Mode Enable	(0) Disabled	R/W (NVM)	Basic (496-5-1)	States: (1) Enabled, (0) Disabled	✓	✓	✓	✓
MSV-1801	Residential Mode Setpoint Source	Residential Mode Setpoint Source	(1) Schedule	R/W (NVM)	Basic (496-19-1)	States: (1) Schedule, (2) Hold	✓	✓	✓	✓
AV-1802	Residential Mode Heat Setpoint	Residential Mode Heat Setpoint	70 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
AV-1803	Residential Mode Cool Setpoint	Residential Mode Cool Setpoint	75 Deg F	R/W (NVM)	Basic (496-2-1)	Range: -40 to 160 Deg F	✓	✓	✓	✓
PIV-501	User Access Code	Access code required to change settings at thermostat. Set 0 to disable		R/W (NVM)	Basic (496-48-1)	Range: 0 to 9999	✓	✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
MSV-502	Display Clock Format (12/24 hour)	Time format shown on local display	(1) 12 Hour	R/W (NVM)	Basic (496-19-1)	States: (1) 12 Hour, (2) 24 Hour	✓	✓	✓	✓
MSV-503	Display Units (F/C)	Temperature units on local display	(1) Fahrenheit	R/W (NVM)	Basic (496-19-1)	States: (1) Fahrenheit, (2) Celsius	✓	✓	✓	✓
MSV-504	Display Brightness	Backlight brightness on local display	(3) High	R/W (NVM)	Basic (496-19-1)	States: (1) Low, (2) Medium, (3) High	✓	✓	✓	✓
MSV-505	Display Banner Mode	Information shown in top-right corner of local display	(1) Date & Time and Name	R/W (NVM)	Basic (496-19-1)	State: (1) Date & Time and Name, (2) Date & Time Only	✓	✓	✓	✓
MSV-507	Display Branding Mode	Controls brand information on display	(2) TCS	R/W (NVM)	Basic (496-19-1)	State: (1) None, (2) TCS, (3) Custom	✓	✓	✓	✓
CSV-506	Display Info Text	Optional text shown on local display. Automatically cleared after Command Override Timeout		R/W (NVM)	Basic (496-40-1)		✓	✓	✓	✓
CSV-508	Display About Text	Text shown on About screen when in Custom Branding mode		R/W (NVM)	Basic (496-40-1)		✓	✓	✓	✓
BV-2012	WiFi Enable	Allows the WiFi feature to be disabled if not in use		R/W (NVM)	Basic (496-40-1)	States: (1) Enabled, (0) Disabled	✓	✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
MSV-2010	WiFi Status	Current status of the WiFi connection	(13) Disabled	R, NVM	Basic (496-19-1)	(1) Unknown, (2) Connected, (3) Initializing, (4) Initialized, (5) Disconnecting, (6) Not Configured, (7) Key Invalid, (8) Join Failed, (9) Authenticating, (10) Optaining DHCP, (11) Configuring Sockets, (12) Scanning for SSID, (13) Disabled	✓	✓	✓	✓
PIV-2011	Signal Strength	Signal strength as measured by the radio		R, NVM	Basic (496-19-1)	**Larger numbers are better**	✓	✓	✓	✓
CSV-2000	IP Address	Current or last known IPv4 address in dotted notation	0.0.0.0	R/W, NVM	Basic (496-40-1)	Write only if Static Addressing	✓	✓	✓	✓
CSV-2001	IP Subnet Mask	Current or last known IPv4 subnet mask address in dotted notation	0.0.0.0	R/W, NVM	Basic (496-40-1)	Write only if Static Addressing	✓	✓	✓	✓
CSV-2002	IP Gateway Address	Current or last known IPv4 gateway address in dotted notation	0.0.0.0	R/W, NVM	Basic (496-40-1)	Write only if Static Addressing	✓	✓	✓	✓
CSV-2009	IP DNS Address	Current or last known IPv4 DNS address in dotted notation	0.0.0.0	R/W, NVM	Basic (496-40-1)	Write only if Static Addressing	✓	✓	✓	✓
PIV-2003	IP BACnet Port	Current port used for BACnet/IP traffic	47808	R/W, NVM	Basic (496-48-1)	Range: 47808 - 47823	✓	✓	✓	✓
CSV-2004	IP Name	Name presented by device on network		R/W, NVM	Basic (496-40-1)		✓	✓	✓	✓

Object ID	Name	Description	Default Value	PV Access	Object Profile	Additional Info	4010 4110	4020 4120	4040 4140	4050 4150
MSV-2005	IP Address Mode	IP Address Mode	DHCP (1)	R/W, NVM	Basic (496-19-1)	States: (1_ DHCP, (2) Static	✓	✓	✓	✓
CSV-2006	WiFi SSID	WiFi Netowrk SSID		R/W, NVM	Basic (496-40-1)		✓	✓	✓	✓
CSV-2007	WiFi Passphrase	WiFi Network Passphrase		W, NVM	Basic (496-40-1)		✓	✓	✓	✓
MSV-2008	WiFI Security Mode	WiFi Security Mode	(1) None	R/W, NVM	Basic (496-19-1)	State: (1) None, (2) WPA, (3) WPA2, (4) WEP	✓	✓	✓	✓
CVS-2013	MAC Address	MAC Address in hyphen notation		R/W, NVM	Basic (496-40-1)		✓	✓	✓	✓
PIV-2014	WiFi Reset Interval	Interval in Hours to wait between reseeting the WiFI interface.	12	R/W, NVM	Basic (496-48-1)	Range 0 to 48 Hours	✓	✓	✓	✓
BV-2017	Foreign Device Registration Enable	Turn on foreign device registration functionality	(0) Disabled	R/W, NVM	Basic (496-5-1)	State: (1) Enabled, (0) Disabled	✓	✓	✓	✓
CSV-2015	IP Address of BBMD	IPv4 address of BBMD, in dotted notation		R/W, NVM	Basic (496-40-1)		✓	✓	✓	✓
PIV-2016	Foreign Device Registration TTL	Interval in seconds that will be requested as TTL with BBMD	1800 sec	R/W, NVM	Basic (496-48-1)	Range: 30 to 65534 Seconds	✓	✓	✓	✓
FILE-1300	Firmware Upgrade File	Firmware Upgrade File		R/W, NVM	Dataflash (496-10-1)		✓	✓	✓	✓
FILE-1301	Factory Settings File	Factory Settings File		R/W, NVM	Dataflash (496-10-2)		✓	✓	✓	✓
FILE-1302	User Settings File	User settings for backup and restore		R/W, NVM	Dataflash (496-10-2)		✓	✓	✓	✓

FILE-1303	Operation Statistics File	Operation Statistics File		R/W, NVM	Dataflash (496-10-2)		✓	✓	✓	✓
FILE-1304	User Image File	User Image File		R/W, NVM	Dataflash (496-10-1)		✓	✓	✓	✓
FILE-1320	Diagnostic Log File	Diagnostic Log File		R/W, NVM	Basic (496-10-3)		✓	✓	✓	✓
IV-3000	IV Example Object	IV Example Object	0	R/W, NVM	Basic (496-45-2)	Range: -100 to 100	✓	✓	✓	✓
PIV-3001	PIV Object Example	PIV Object Example	0	R/W, NVM	Basic (496-45-2)		✓	✓	✓	✓
MSV-318	Y1 Mode	Heat Stage 2 in Conventional Mode	(1) Cool Stage 1	R/W. NVM	State: (1) Cool Stage 1, (2) Heat Stage 2		✓			

UbiquiSTAT™ Wall Mount Template

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View from front with top cover removed