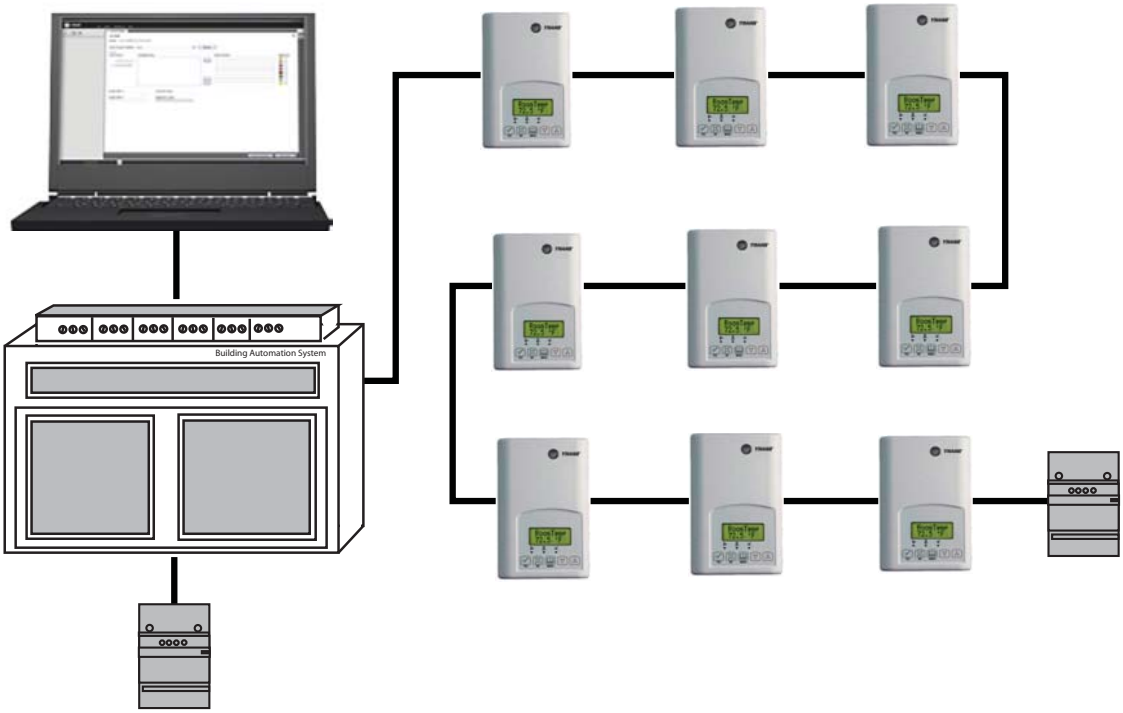
Integration Manual

Trane Communicating Thermostats (BACnet)



⚠SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

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NOTICE:	Indicates a situation that could result in equipment or property-damage only accidents.

Table of Contents

Overview 5
- Product Description 5
- Related Documents 6
- Planning Your Integration 6
- “How To” Information 6

Summary of BACnet Objects 7
- Supported BACnet Services 7
- Default Device Name and Default Device ID 7
- Fan Coil Objects 8
- Rooftop and Heat Pump Objects 10
- Standard Object Types Supported 12
- List of Proprietary Properties 13
- Configuration Objects for Fan Coils 13
- Configuration Objects for Rooftop and Heat Pump Units 13

BACnet Object Properties 14
- Fan Coil Object Properties 14
- Rooftop and Heat Pump Object Properties 19

Objects You Can Use in Site Graphics 23
- Fan Coils 23
- Rooftop and Heat Pump Units 24

Wiring Requirements for Communicating Thermostats 25
- BACnet MS/TP Link Wiring 25
  - BACnet Configuration Requirements 25
  - BACnet Wiring Best Practices 25
  - BACnet Wiring Procedure 26
  - Trane BACnet Termination for BACnet Links 26
- Product Specifications 27
- Network Adapter 27
- Communicating Thermostat Status LEDs 28
- Troubleshooting 28

Additional Information and Considerations 29
- MS/TP Network Integration 29
  - Site Graphics 29
  - Free Programmed Objects or Loops (Supervisory Controllers Other Than Tracer SC) 29
  - Retries and Timeouts (Supervisory Controllers Other Than Tracer SC) . 30

Objects and Parameters 30
Tracer SC Network Configuration 32
Data Normalization 36
Example: Occupancy Request 36
Template: TStat_FanCoil_Trane 36
Template: TStat_HeatPump_Trane 39
Template: TStat_RTU_Trane 40
Trane Communicating Thermostat Points List 42
TStat_Fan_Coil_Trane 42
TStat_HeatPump_Trane Template 43
TStat_RTU_Trane Template 44

Overview

This document is written to guide you through integration of the Trane Communicating Thermostats into an MS/TP network using the BACnet protocol and managed by a Tracer SC.

Product Description

The Trane Communicating Thermostats are available for heat pump, rooftop, and fan coil applications.

- X13511541010 and -2010 (Heat Pump and Rooftop)
  These Trane Communicating Thermostats are BACnet MS/TP devices specifically designed for single stage and multi-stage control of heating/cooling equipment such as rooftop and self-contained units. The products feature an intuitive, menu-driven, back-lit LCD display, which walks users through the programming steps, making the process extremely simple.
- X13511543010 (Fan Coil)
  This Trane Communicating thermostat is specifically designed for fan coil control. The product features a backlit LCD display with dedicated function menu buttons for simple operation. Three additional inputs are also provided for monitoring and / or various advanced functions. All models feature configurable System and Fan button functions to meet a variety of applications.

Accurate temperature control is achieved due to the product's PI proportional control algorithm, which virtually eliminates temperature offset associated with traditional, differential-based thermostats.

The Communicating Thermostats contain an SPST auxiliary switch that can be used to control lighting or auxiliary reheat. Three additional inputs are also provided for monitoring and / or various advanced functions.

The thermostats are also compatible with the occupancy sensor cover accessories. Thermostats equipped with an occupancy sensor cover provide advanced active occupancy logic, which will automatically switch occupancy levels from Occupied to Unoccupied as required by local activity being present or not. This advanced occupancy functionality provides advantageous energy savings during occupied hours without sacrificing occupant comfort.

Related Documents

See the following documents for Communicating Thermostat installation and configuration information.

- *Trane Communicating Thermostats for Heat Pump Control User Guide* (BAS-SVU10x-EN)
- *Trane Communicating Thermostats for Rooftop Control User Guide* (BAS-SVU11x-EN)
- *Trane Communicating Thermostats for Fan Coil Control User Guide* (BAS-SVU12x-EN)

See the following documents for Tracer SC network integration information.

- *Tracer™ SC System Controller Installation and Setup* (BAS-SVX31*x*-EN)
- *Tracer™ BACnet™ Terminator Installation* (X39641151-01*x*)
- *Unit Controller Wiring Guide For the Tracer SC™ System Controller* (BAS-SVN03*x*-EN

Finally, see the following documents for information about equipment including fan coils, rooftop units, and heat pumps.

- *Communicating Thermostats for Rooftop and Heat Pump Control Product Data Sheet (BAS-PRC064-EN)*
- *Communicating Thermostats for Fan Coil Control Product Data Sheet (BAS-PRC065-EN)*

All these documents are available from your Trane distributor.

Planning Your Integration

Study the following information presented in the chapters of this guide as you plan the work:

- Communicating Thermostat BACnet objects (points) and their properties (ranges, values, and enumeration sets for points). (See "Summary of BACnet Objects," p. 7. and "BACnet Object Properties," p. 14.)
- Tips and considerations presented in "Additional Information and Considerations," p. 29. If your network is managed by a Tracer SC, pay special attention to "Tracer SC Network Configuration," p. 32.
- Wiring instructions in "Wiring Requirements for Communicating Thermostats," p. 25.
- Available Graphical User Interface (GUI) objects that you can use in graphics presented in "Objects You Can Use in Site Graphics," p. 23.

"How To" Information

The following "how to" questions are described or clarified either in this manual or in other documents cited in this table.

Question	Information Location or Answer
How do I set up alarming in Tracer SC?	See the *Tracer™ SC System Controller Installation and Setup Manual* (BAS-SVX31*x*-EN)
How do I set the MAC address of the Trane Communicating Thermostat?	See "Default Device Name and Default Device ID," p. 7. Also, see the appropriate User Guide listed in "Related Documents" on this page.
How do I install a Trane Communicating Thermostat on the Tracer SC link?	See "No automatic installation," p. 32.

Summary of BACnet Objects

The Building Automation and Control Network (BACnet and ANSI/ASHRAE Standard 135-2004) protocol is a standard that allows building automation systems or components from different manufacturers to share information and control functions. BACnet provides building owners the capability to connect various types of building control systems or subsystems together for many uses. In addition, multiple vendors can use this protocol to share information for monitoring and supervisory control between systems and devices in a multi-vendor interconnected system.

The BACnet protocol identifies standard objects (data points) called BACnet objects. Each object has a defined list of properties that provide information about that object. BACnet also defines a number of standard application services that are used to access data and manipulate these objects and provides a client/server communication between devices.

Supported BACnet Services

The BACnet communicating thermostat meets all requirements for designation as an Application Specific Controller (B-ASC). The BACnet thermostat series supports the following BACnet Interoperability Building Blocks (BIBBs).

Table 1. BACnet Interoperability Building Blocks

Application Service	Designation
Data Sharing – Read Property - B	DS-RP-B
Data Sharing – Read Property Multiple - B	DS-RPM-B
Data Sharing – Write Property - B	DS-WP-B
Device Management - Device Communication Control - B	DM-DCC-B
Device Management – Dynamic Device Binding - B	DM-DDB-B
Device Management – Dynamic Object Binding - B	DM-DOB-B

Notes:

- *The thermostat does not support seqmented requests or responses.*
- Models X13511541010 and -2010—*Time synchronization can be made through a network even if the thermostat does not support the full date. Therefore, the device cannot claim conformance to the DeviceManagement – TimeSynchronization - B (DM-TS-B) service. The device object does not have the Local_Time or Local_Date properties.*

Default Device Name and Default Device ID

The Default Device Name is set to: TStat_*EquipType*_Trane_*MAC* where: *EquipType* is FanCoil, RTU, or HeatPump and *MAC* is the current MAC address of the device.

- The Device Name is changed if you change the device MAC address.
- The Device Name and Device ID properties are writable in the Device object. Both properties can be changed from any BACnet network management tool as long as the tool itself can write to these properties.

(X13511543010) Fan Coil Models

- Default Device ID is set to: 7300*MAC* where *MAC* is the current MAC address of the device that you set from the Installer Configuration Parameter menu on the Trane Communicating Thermostat.
- The Device ID changes if the device's MAC address is changed. For example, when a fan coil communicating thermostat with a MAC address of 41 is connected to a network, its default Device Name will be TStat_FanCoil_Trane_41 and its default Device ID will be 730041.

(X13511541010 and -2010) Rooftop and Heat Pump Models

- Default Device ID is set to: 7600MAC where *MAC* is the current MAC address of the device.
- The device ID and the Device Name change if you change the device's MAC address. For example, when a heat pump communicating thermostat with a MAC address of 63 is connected to a network, its default Device Name will be TStat_HeatPump_Trane_63 and its default Device ID will be 760063.

Fan Coil Objects

Table 2. Objects table for fan coils (X13511543010)

Object Name	Type and Instance	Object Property
Room Temperature	AV 7	Present_Value (R,W)
Room Temp Override	BV 8	Present_Value (R,W)
Outdoor Temperature	AV 9	Present_Value (R,W)
Supply Temperature	AI 12	Present_Value (R)
AUX Command	BV 14	Present_Value (R,W)
Sequence of Operation	MV 15	Present_Value (R,W)
System Mode	MV 16	Present_Value (R,W)
Fan Mode	MV 17	Present_Value (R,W)
Occupancy Command	MV 18	Present_Value (R,W)
Keypad Lockout	MV 19	Present_Value (R,W)
Control Output	**GRP 20**	**Present_Value (R)**
PI Heating Demand	AV 21	Present_Value (R)
PI Cooling Demand	AV 22	Present_Value (R)
Controller Status	**GRP 24**	**Present_Value (R)**
AUX Status	BI 25	Present_Value (R)
Heating Valve Status	MV 26	Present_Value (R)
Cooling Valve Status	MV 27	Present_Value (R)
Fan Status	MV 28	Present_Value (R)
BI 1 Status	BI 29	Present_Value (R)
BI 2 Status	BI 30	Present_Value (R)
UI 3 Status	BI 31	Present_Value (R)
Local Motion	BI 32	Present_Value (R)
Effective Occupancy	MV 33	Present_Value (R)
Controller Alarms	**GRP 34**	**Present_Value (R)**
Window Alarm	BI 35	Present_Value (R)
Filter Alarm	BI 36	Present_Value (R)
Service Alarm	BI 37	Present_Value (R)
Temperature Setpoints	**GRP 38**	**Present_Value (R)**
Occupied Heat Setpoint	AV 39	Present_Value (R,W)
Occupied Cool Setpoint	AV 40	Present_Value (R,W)
Stand-by Heat Setpoint	AV 41	Present_Value (R,W)
Stand-by Cool Setpoint	AV 42	Present_Value (R,W)

Table 2. Objects table for fan coils (X13511543010) (continued)

Object Name	Type and Instance	Object Property
Unoccupied Heat Setpoint	AV 43	Present_Value (R,W)
Unoccupied Cool Setpoint	AV 44	Present_Value (R,W)
General Options 1	**GRP 45**	**Present_Value (R)**
BI 1 Configuration	MV 46	Present_Value (R,W)
BI 2 Configuration	MV 47	Present_Value (R,W)
UI 3 configuration	MV 48	Present_Value (R,W)
Menu Scroll	BV 49	Present_Value (R,W)
Auto Mode Enable	BV 50	Present_Value (R,W)
Temperature Scale	BV 51	Present_Value (R,W)
Pipe Number	MV 52	Present_Value (R,W)
AUX Configuration	MV 54	Present_Value (R,W)
General Options 2	**GRP 55**	**Present_Value (R)**
Password Value	AV 56	Present_Value (R,W)
Fan Mode Sequence	MV 58	Present_Value (R,W)
Heating Setpoint Limit	AV 58	Present_Value (R,W)
Cooling Setpoint Limit	AV 59	Present_Value (R,W)
Setpoint Type	BV 60	Present_Value (R,W)
Setpoint Function	BV 61	Present_Value (R,W)
Temporary Occupancy Time	MV 62	Present_Value (R,W)
Deadband	AV 63	Present_Value (R,W)
Reheat Time Base	BV 64	Present_Value (R,W)
Proportional Band	MV 65	Present_Value (R,W)
Auto Fan	BV 66	Present_Value (R,W)
Stand-by Time	AV 67	Present_Value (R,W)
Unoccupied Time	AV 68	Present_Value (R,W)
Output Configuration Options	**GRP 74**	**Present_Value (R)**
Control Type	BV 75	Present_Value (R,W)
Floating Motor Timing	MV 76	Present_Value (R,W)
On Off Control CPH	MV 77	Present_Value (R,W)

Rooftop and Heat Pump Objects

Table 3. Rooftop and heat pump ungrouped objects

Object Name	Type and Instance	Object Property	Rooftop -1010	Heat Pump -2010	Dehumidification -1050
Room Temperature	AV 7	Present_Value (R,W)	√	√	√
Room Temp Override	BV 8	Present_Value (R,W)	√	√	√
Outdoor Temperature	AV 9	Present_Value (R,W)	√	√	√
Outdoor Temp Override	BV 10	Present_Value (R,W)	√	√	√
Room Humidity	AV 11	Present_Value (R)			√
Occupancy Command	MV 12	Present_Value (R,W)	√	√	√
System Mode HP	MV 13	Present_Value (R,W)		√	
System Mode RTU	MV 14	Present_Value (R,W)	√		√
Fan Mode	MV 15	Present_Value (R,W)	√	√	√
Supply Temp	AI 16	Present_Value (R)	√	√	
Supply RH	AV 17	Present_Value (R)			√
Keypad Lockout	MV 18	Present_Value (R,W)	√	√	√
Control Output	**GR 19**	**Present_Value (R)**	√		√
PI Heating Demand	AV 20	Present_Value (R)	√	√	√
PI Cooling Demand	AV 21	Present_Value (R)	√	√	√
Economizer Output	AV 22	Present_Value (R)	√		
Controller Status	**GRP 23**	**Present_Value (R)**	√		√
AUX	BI 24	Present_Value (R)	√	√	√
G Fan	BI 25	Present_Value (R)	√	√	√
Y1 Cool	BI 26	Present_Value (R)	√	√	√
Y2 Cool	BI 27	Present_Value (R)		√	√
W1 Heat	BI 28	Present_Value (R)	√	√	√
W2 Heat	BI 29	Present_Value (R)	√		√
Reversing Valve	BI 30	Present_Value (R)		√	
DI 1 Status	BI 31	Present_Value (R)	√	√	√
DI 2 Status	BI 32	Present_Value (R)	√	√	
Local Motion	BI 33	Present_Value (R)	√	√	√
Effective Occupancy	MV 34	Present_Value (R)	√	√	√
Controller Alarms	**GRP 35**	**Present_Value (R)**			√
Frost Alarm	BI 36	Present_Value (R)	√	√	√
Filter Alarm	BI 38	Present_Value (R)	√	√	√
Service Alarm	BI 39	Present_Value (R)	√	√	√
Fan Lock Alarm	BI 40	Present_Value (R)	√	√	√
Temperature Setpoints	**GRP 41**	**Present_Value (R)**	√	√	√
Occupied Heat Setpoint	AV 42	Present_Value (R,W)	√	√	√
Occupied Cool Setpoint	AV 43	Present_Value (R,W)	√	√	√
Unoccupied Heat Setpoint	AV 44	Present_Value (R,W)	√	√	√
Unoccupied Cool Setpoint	AV 45	Present_Value (R,W)	√	√	√
General Options 1-	**GRP 46**	**Present_Value (R)**	√	√	√
Temperature Scale	BV 47	Present_Value (R,W)	√	√	√
Heating Setpoint Limit	AV 48	Present_Value (R,W)	√	√	√
Cooling Setpoint Limit	AV 49	Present_Value (R,W)	√	√	√
Heating Lockout Temperature	AV 50	Present_Value (R,W)	√	√	√
Cooling Lockout Temperature	AV 51	Present_Value (R,W)	√	√	√
Deadband	AV 52	Present_Value (R,W)	√	√	√
Heating CPH	MV 53	Present_Value (R,W)	√	√	√

Table 3. Rooftop and heat pump ungrouped objects

Object Name	Type and Instance	Object Property	Rooftop -1010	Heat Pump -2010	Dehumidification -1050
Cooling CPH	MV 54	Present_Value (R,W)	√	√	√
Frost Protection	BV 55	Present_Value (R,W)	√	√	√
Aux Contact	BV 56	Present_Value (R,W)	√	√	√
Menu Scroll	BV 57	Present_Value (R,W)	√	√	√
General Options 2-	**GRP 58**	**Present_Value (R)**	√	√	√
Password Value	AV 59	Present_Value (R,W)	√	√	√
Power-up Delay	AV 60	Present_Value (R,W)	√	√	√
Temporary Occupancy Time	MV 61	Present_Value (R,W)	√	√	√
Fan Control	BV 62	Present_Value (R,W)	√	√	√
Anticycle	MV 63	Present_Value (R,W)	√	√	√
Fan Purge Delay	BV 64	Present_Value (R,W)	√	√	√
DI 1 Configuration	MV 65	Present_Value (R,W)	√	√	√
DI 2 Configuration	MV 66	Present_Value (R,W)	√	√	
Proportional Band	MV 67	Present_Value (R,W)	√	√	√
Unoccupied Time	AV 68	Present_Value (R,W)	√	√	√
Stages Configuration Options	**GRP 72**	**Present_Value (R)**			**√**
Heating Stages	MV 73	Present_Value (R,W)	√		√
Cooling Stages	MV 74	Present_Value (R,W)	√		√
Heatpump Stages	MV 75	Present_Value (R,W)		√	
Economizer Model Configuration Options	**GRP 76**	**Present_Value (R)**	√		
Economizer Changeover Setpoint	AV 77	Present_Value (R,W)	√		
Economizer Minimum Position	AV 78	Present_Value (R,W)	√		
Mechanical Cooling Enabled	BV 79	Present_Value (R,W)	√		
Mixed Air Setpoint	AV 80	Present_Value (R,W)	√		
Heatpump Model Configuration Options	**GRP 81**	**Present_Value (R)**		**√**	√
High Balance Point	AV 82	Present_Value (R,W)		√	√
Low Balance Point	AV 83	Present_Value (R,W)		√	√
Comfort Mode	BV 84	Present_Value (R,W)		√	√
Reversing Valve Configuration	BV 85	Present_Value (R,W)		√	
Compressor Interlock	BV 86	Present_Value (R,W)		√	
Dehumidification Model Configuration Options	**GRP 87**	**Present_Value (R)**			√
RH Display	BV 88	Present_Value (R,W)			√
Dehumidification RH Setpoint	AV 89	Present_Value (R,W)			√
Dehumidification Hysterisys	AV 90	Present_Value (R,W)			√
Dehumidification Low OA Lockout	AV 91	Present_Value (R,W)			√
Dehumidification Lockout Functions	BV 92	Present_Value (R,W)			√
Dehumidification Output Status	BI 93	Present_Value (R)			√
Humidification Model Configuration Options	**GRP 94**	**Present_Value (R)**			√
Humidification RH Setpoint	AV 95	Present_Value (R,W)			√

Table 3. Rooftop and heat pump ungrouped objects

Object Name	Type and Instance	Object Property	Rooftop -1010	Heat Pump -2010	Dehumidification -1050
Eff (Effective) Reset Humidification RH Spt (Setpoint)	AV 96	Present_Value (R)			√
Humidification High Limit Spt (Setpoint)	AV 97	Present_Value (R,W)			√
Low RH Setpoint	AV 98	Present_Value (R,W)			√
Low Temp Reset RH Setpoint	AV 99	Present_Value (R,W)			√
High Temp Reset RH Setpoint	AV 100	Present_Value (R,W)			√
Humidifier Output	AV 101	Present_Value (R)			√

Standard Object Types Supported

Table 4. Standard object types supported

Object Type	Supported Objects	Dynamically Creatable	Dynamically Deletable	Optional Properties Supported	Writable Properties
Analog Input	✓			Reliability	Out_of_Service
Analog Value	✓			Reliability	Present_Value (a,b,e) Out_of_Service (a,e) Object_Name (c ,f)
Binary Input	✓			Reliability Active_Text Inactive_Text	Out_of_Service
Binary Value	✓			Reliability Active_Text Inactive_Text	Present_Value Out_of_Service
Device	✓			Max_Master Max_Info_frames	Object_Identifier Object_name Max_Master
Group	✓			N/A	N/A
Multi-state Value	✓			Reliability States_Text	Present_Value (d) Out_of_Service (d)
Schedule (Rooftop and heat pump only)	✓			Weekly_schedule	Present_Value Weekly_Schedule

Footnotes for fan coils:
a : Present_Value and Out_of_Service properties are writable for every AV objects except PI Heating Demand (AV21) and PI Cooling Demand (AV22).
b : Present_Value property for Room Temperature (AV7) and Room Humidity (AV10) is writable only if Room Temp Override (BV8) is enabled and Room Humidity Override (BV11) is enabled respectively.

c : Object_Name property is writable only for Room Temperature (AV7).
d : Present_Value and Out_of_Service properties are writable for every MV objects except Heating Valve Status (MV26), Cooling Valve Status (MV27), Fan Status (MV28), and Effective Occupancy (MV33)

Footnotes for rooftop units and heat pumps
e: The following AV's are defined as read only. When Out_of_Service properties is set to true, the Present_Value, if written, is not derived to the application level of the thermostat.
- Room Humidity (AV11)
- PI Heating Demand (AV20)
- PI Cooling Demand (AV21)
- Economizer Output (AV22)
- Eff Reset Humidification RH Spt (AV96)
- Humidifier Output (AV101)

f: Object_Name property is writable for 1 object only: Room_Temperature (AV7).

List of Proprietary Properties

Table 5. Proprietary Properties

Property Name	ID	BACnet Data Type	Description
Major_Version	1000	CharacterString	The version number of the BACnet communications module. This the hardware version number
MS/TP_Address	1001	Unsigned	Display the MAC layer address of the module
MS/TP_Baud_Rate	1002	Unsigned	Display the communication baud rate of the module
Sensor_Offset	1005	REAL	Display the temperature or humidity calibration value. The range is –5.0 deg F to 5.0 deg F for a temperature and –15% to 15% for humidity.

Configuration Objects for Fan Coils

The following objects and group objects listed in Table 2, p. 8 should be typically used for configuration purposes:

- General Options 1 Group GRP 45 and its complete list of objects
- General Options 2 Group GRP 55 and its complete list of objects
- Output Configuration Options Group GRP 74 and its complete list of objects

Configuration Objects for Rooftop and Heat Pump Units

The following objects and group objects listed in Table 2, p. 8 should be typically used for configuration purposes:

- General Options 1 Group GRP 46 and its complete list of objects
- General Options 2 Group GRP 58 and its complete list of objects
- Programmable Model Configuration Options Group GRP 69 and its complete list of objects
- Stages Configuration Options Group GRP 72 and its complete list of objects;
- Economizer Model Configuration Option Group GRP 76 and its complete list of objects;
- Heatpump Model Configuration Option Group GRP 81 and its complete list of objects;
- Dehumidification Model Configuration Option Group GRP 87 and its complete list of objects;
- Humidification Model Configuration Option Group GRP 94 and its complete list of objects;

BACnet Object Properties

This section lists ranges, enumerations, and values for the set of Communicating Thermostat objects.

Fan Coil Object Properties

Table 6. List of property value range restrictions

Object Name	Object Type and Instance	Minimum Range Value	Maximum Range Value	Default Value
Room Temperature	AV 7	-39.9°F (-40°C)	121.9°F (50°C)	N/A
Outdoor Temperature	AV 9	-39°F (-40°C)	121.9°F (50°C)	N/A
Room Humidity	AV 10	5%	90%	N/A
Supply Temperature	AI 12	-39.9°F (-40°C)	121.9°F (50°C)	N/A
PI Heating demand	AV 21	0%	100%	0%
PI Cooling demand	AV 22	0%	100%	0%
Occupied Heat Setpoint	AV 39	40°F (4.5°C)	90°F (32°C)	72°F (22°C)
Occupied Cool Setpoint	AV 40	54°F (12°C)	100°F (37.5°C)	74°F (24°C)
Stand-by Heat Setpoint	AV 41	40°F (4.5°C)	90°F (32°C)	72°F (22°C)
Stand-by Cool Setpoint	AV 42	54°F (12°C)	100°F (37.5°C)	74°F (24°C)
Unoccupied Heat Setpoint	AV 43	40°F (4.5°C)	90°F (32°C)	62°F (16.5°C)
Unoccupied Cool Setpoint	AV 44	54°F (12°C)	100°F (37.5°C)	80°F (26.5°C)
Password Value	AV 56	0	1000	0
Heating Setpoint Limit	AV 58	40°F (4.5°C)	90°F (32°C)	90°F (32°C)
Cooling Setpoint Limit	AV 59	54°F (12°C)	100°F (37.5°C)	54°F (12°C)
Deadband	AV 63	2°F (1°C)	5°F (2.5°C)	2°F (1°C)
Stand-by Time	AV 67	0.5 Hours	24.0 Hours	0.5 Hours
Unoccupied Time	AV 68	0.0 Hours	24.0 Hours	0.0 Hours
RH Setpoint	AV 45	30%	100%	50%
Dehumidification Hysterisys	AV 46	2%	20%	5%
Dehumidification MAX cooling	AV 47	20%	100%	100%

Table 7. List of property enumeration sets for BV objects and BI objects

Object Name	Object Type and instance	Inactive_Text	Active_Text	Default value
Room Temp Override	BV 8	Normal	Override	Normal
Room Humidity Override	BV 11	Normal	Override	Normal
Dehumidification Lockout	BV 13	Disabled	Enabled	Enabled
AUX Command	BV 14	Off	On	Off
Dehumidification Status	BI 23	Off	On	Off
Aux Status	BI 25	Off	On	Off
BI 1 Status	BI 29	Deactivated	Activated	Deactivated
BI 2 Status	BI 30	Deactivated	Activated	Deactivated
UI 3 Status(*)	BI 31	Deactivated	Activated	Deactivated
Local Motion	BI 32	No Motion	Motion	No Motion
Window Alarm	BI 35	Off	On	Off

Table 7. List of property enumeration sets for BV objects and BI objects (continued)

Object Name	Object Type and instance	Inactive_Text	Active_Text	Default value
Filter Alarm	BI 36	Off	On	Off
Service Alarm	BI 37	Off	On	Off
Menu Scroll	BV 49	No Scroll	Scroll Active	Scroll Active
Auto Mode Enable	BV 50	Disabled	Enabled	Enabled
Temperature Scale	BV 51	°C	°F	°F
Setpoint Type	BV 60	Permanent	Temporary	Permanent
Setpoint Function	BV 61	Dual Setpoints	Attached Setpoints	Dual Setpoints
Reheat Time Base	BV 64	15 minutes	10 seconds	15 minutes
Auto Fan	BV 66	Auto Speed	Auto Speed / Auto Demand	Auto Speed
RH Display	BV 70	Disabled	Enabled	Disabled
Control Type	BV 75	On/Off	Floating	On/Off
Direct/ Reverse Acting	BV 78	Direct Acting	Reverse Acting	Direst Acting

* This object will be linked to the value of the 'UI 3 Configuration' object. When the 'UI 3 Configuration' object value is 0, 3 or 4, the value will be set to 'Deactivated.'

Table 8. List of property enumeration sets for MV objects

Object Name	Object ID	BACnet Index	Text	Default value
Sequence of Operation		1	Cooling Only	Heating Only
		2	Heating Only	
	MV 15	3	Cooling & Reheat	
		4	Heating & Reheat	
		5	Cool/Heat4P	
		6	Cool/Heat4P&Reht	
System Mode **Table Note 1**		1	Off	**Table Note 2**
	MV 16	2	Auto	
		3	Cool	
		4	Heat	
Fan Mode **Table Note 3**	MV 17	1, 2, 3 or 4	**Table Note 4**	**Table Note 5**
Occupancy Command	MV 18	1	Local Occupancy	Depends on network command
		2	Occupied	
		3	Unoccupied	
Keypad Lockout	MV 19	1	Level 0	Level 0
		2	Level 1	
		3	Level 2	
		4	Level 3	
		5	Level 4	
		6	Level 5	

Table Notes:
1 Enumeration sets for MV16 depends on Sequence of Operation (MV15) value upon device discovery. If required enumeration is not present, set MV15 to desired value and rediscover MV16 object. Available enumeration will now reflect required configuration.
2 Default value of MV16 depends on MV15 value upon device discovery. (See Table 9.)

Table 9. MV15 (Sequence of Operation) values for Note 2

MV15 Index	Function	Default Value is BV50 Enabled	Default Value is BV50 Disabled
1	Cooling Only	Cool	Cool
2	Cooling with Reheat	Auto	Heat
3	Heating Only	Heat	Heat
4	Heating with Reheat	Heat	Heat
5	Cooling/Heating 4 Pipes	Auto	Heat
6	Cooling/Heating 4 Pipes with Reheat	Auto	Heat

Table Notes: (continued)
3 Enumeration sets for MV17 depends on Fan Mode Sequence (MV58) value upon device discovery. If required enumeration is not present, set MV58 to desired value and rediscover MV17 object. Available enumeration will now reflect required configuration.
4, 5 Available state text and default value depends on Fan Mode Sequence (MV58) value upon device discovery.

MV17 Index	Function MV58 State Text Index	Default Value
1	1 Low - 2 Med - 3 High	High
2	1 Low - 2 High	High
3	1 Low - 2 Med - 3 High - 4 Auto	High
4	1 Low - 2 High - 3 Auto	High
5	1 Auto -2 On	Auto

Table 10. Additional MV values

Object Name	Object ID	BACnet Index	Text	Default value
Heating Valve Status **Table Note 6**	MV 26	**Table Note 7**	**Table Note 7**	**Table Note 7**
Cooling Valve Status **Table Note 8**	MV 27	**Table Note 9**	**Table Note 9**	**Table Note 9**
Fan Status	MV 28	1	Off	Off
		2	Low	
		3	Med	
		4	High	
Effective Occupancy	MV 33	1	Occupied	Depends on local occupancy
		2	Unoccupied	
		3	Temporary Occupied	
		4	Stand-by	

Table Notes:
6 Enumeration sets for MV26 depends on Control Type (BV75) value and Pipe Number (MV52) value upon device discovery. If required enumeration is not present, set BV75 and MV52 to desired value and rediscover MV26 object. Available enumeration will now reflect required configuration.
7 Available object name, state text and default value depends on Control Type (BV75) value and Pipe Number (MV52) upon device discovery as shown in Table 11.

Table 11. Various object indexes and values for Note 7

BV75 Value	MV52 Index	MV26 Object Name	Function MV26 State Text Index	Default Value
On/Off	1 (2 pipe)	Unused Output	N/A	N/A
	2 (4 pipe)	Heating Valve Status	1 Closed – 2 Open	Closed
Floating	1 (2 pipe)	Unused Output	N/A	N/A
	2 (4 pipe)	Heating Valve Status	1 Stopped - 2 Opening - 3 Closing	Stopped

8 Enumeration sets for MV27 depends on Control Type (BV75) value and Pipe Number (MV52) value upon device discovery. If required enumeration is not present, set BV75 and MV52 to desired value and rediscover MV27 object. Available enu-

meration will now reflect required configuration.

9 Available object name, state text and default value depends on Control Type (BV75) value and Pipe Number (MV52) upon device discovery. (See Table 12.)

Table 12. Various object indexes and values for Note 9

	MV52 Index	MV27 Object Name	Function MV26 State Text Index	Default Value
On/Off	1 (2 pipe)	Heat/Cool Valve Status	1 Closed – 2 Open	Closed
	2 (4 pipe)	Cooling Valve Status	1 Closed – 2 Open	Closed
Floating	1 (2 pipe)	Heat/Cool Valve Status	1 Stopped - 2 Opening - 3 Closing	Stopped
	2 (4 pipe)	Cooling Valve Status	1 Stopped - 2 Opening - 3 Closing	Stopped

Table 13. Additional MV Values

Object Name	Object ID	BACnet Index	Text	Default Value
BI1 Configuration	MV 46	1	None	None
		2	Rem NSB	
		3	Motion NO	
		4	Motion NC	
		5	Window	
BI2 Configuration	MV 47	1	None	None
		2	Door Dry	
		3	Override	
		4	Filter	
		5	Service	
UI3 Configuration	MV 48	1	None	None
		2	COC/NH	
		3	COC/NC	
		4	COS	
		5	SS	
Pipe Number	MV 52	1	2 Pipe	4 Pipes
		2	4 Pipe	
Out#1 Cfg	MV 53	1	2	4
		2	4	
AUX Configuration	MV 54	1	Not used	Not Used
		2	NO with Occ	
		3	NC with Occ	
		4	NO with Occ & Fan	
		5	NC with Occ & Fan	
		6	Network controlled	
Fan Mode Sequence	MV 58	1	Low-Med-High	On-Auto
		2	Low-High	
		3	Low-Med-High-Auto	
		4	Low-High-Auto	
		5	On-Auto	

Table 13. Additional MV Values (continued)

Object Name	Object ID	BACnet Index	Text	Default Value
Temporary Occupancy Time	MV 62	1	0 hour	2 hours
		2	1 hour	
		3	2 hours	
		4	3 hours	
		5	4 hours	
		6	5 hours	
		7	6 hours	
		8	7 hours	
		9	8 hours	
		10	9 hours	
		11	10 hours	
		12	11 hours	
		13	12 hours	
		14	13 hours	
		15	14 hours	
		16	15 hours	
		17	16 hours	
		18	17 hours	
		19	18 hours	
		20	19 hours	
		21	20 hours	
		22	21 hours	
		23	22 hours	
		24	23 hours	
		25	24 hours	
Proportional Band	MV 65	1	3 3 F 1.2 C	3
		2	4 4 F 1.7 C	
		3	5 5 F 2.2 C	
		4	6 6 F 2.8 C	
		5	7 7 F 3.3 C	
		6	8 8 F 3.9 C	
		7	9 9 F 5.0 C	
		8	10 10 F 5.6 C	
Floating Motor Timing	MV 76	1	0.5 minute	1.5 minutes
		2	1 minute	
		3	1.5 minutes	
		4	2 minutes	
		5	2.5 minutes	
		6	3 minutes	
		7	3.5 minutes	
		8	4 minutes	
		9	4.5 minutes	
		10	5 minutes	
		11	5.5 minutes	
		12	6 minutes	
		13	6.5 minutes	
		14	7 minutes	
		15	7.5 minutes	
		16	8 minutes	
		17	8.5 minutes	
		18	9 minutes	

Table 13. Additional MV Values (continued)

Object Name	Object ID	BACnet Index	Text	Default Value
On-Off Control CPH	MV 77	1	3 CPH	4 CPH
		2	4 CPH	
		3	5 CPH	
		4	6 CPH	
		5	7 CPH	
		6	8 CPH	

Rooftop and Heat Pump Object Properties

Table 14. List of property value range restrictions for AI and AV objects

Object Name	Object Type and Instance	Under Range Value	Over Range Value	Default Value
Room Temperature	AV 7	-40°F (-40°C)	122°F (50°C)	N/A
Outdoor Temperature	AV 9	-40°F (-40°C)	122°F (50°C)	N/A
Room Humidity	AV 11	0%	100%	N/A
Supply Temp	AI 16	-40°F (-40°C)	122°F (50°C)	N/A
Supply RH	AV 17	0%	100%	N/A
PI Heating Demand	AV 20	0%	100%	N/A
PI Cooling Demand	AV 21	0%	100%	N/A
Economizer Output	AV 22	0%	100%	N/A
Occupied Heat Setpoint	AV 42	40°F (4.5°C)	90°F (32°C)	72°F (22°C)
Occupied Cool Setpoint	AV 43	54°F (12°C)	100°F (37.5°C)	75°F (24°C)
Unoccupied Heat Setpoint	AV 44	40°F (4.5°C)	90°F (32°C)	62°F (16.5°C)
Unoccupied Cool Setpoint	AV 45	54°F (12°C)	100°F (37.5)	80°F (26.5°C)
Heating Setpoint Limit	AV 48	40°F (4.5°C)	90°F (32°C)	90°F (32°C)
Cooling Setpoint Limit	AV 49	54°F (12°C)	100°F (37.5)	54°F (12°C)
Heating Lockout Temperature	AV 50	-15°F (-26°C)	120°F (49°C)	120°F (49°C)
Cooling Lockout Temperature	AV 51	-40°F (-40°C)	95°F (35°C)	-40°F (-40°C)
Deadband	AV 52	2°F (1°C)	4°F (2°C)	2°F (1°C)
Password Value	AV 59	0	1000	0
Power-up Delay	AV 60	10 sec	120 sec	10 sec
Unoccupied Time	AV 68	0.5 hrs	24.0. hrs	0.5 hrs
Economizer Changeover Setpoint	AV 77	14°F (-10°C)	70°F (21°C)	55°F (13°C)
Economizer Minimum Position	AV 78	0%	100%	0%
Mixed Air Setpoint	AV 80	50°F (10°C)	90°F (32°C)	55°F (13°C)
High Balance Point	AV 82	34°F (1°C)	90°F (32°C)	90°F (32°C)
Low Balance Point	AV 83	-40°F (-40°C)	30°F (-1°C)	-12°F (-24°C)
Dehumidification RH Setpoint	AV 89	15%	95%	70%
Dehumidification Hysterisys	AV 90	2%	20%	5%
Dehumidification Low OA Lockout	AV 91	-40°F (-40°C)	122°F (50°C)	32°F (0°C)
Humidification RH Setpoint	AV 95	10%	90%	50%
Eff (Effective) Reset Humidification RH Spt (Setpoint)	AV 96	0%	100%	N/A
Humidification High Limit Spt (Setpoint)	AV 97	50%	90%	85%
Low RH Setpoint	AV 98	10%	90%	20%
Low Temp Reset RH Setpoint	AV 99	-40°F (-40°C)	15°F (-9.5°C)	-20°F (-29°C)
High Temp Reset RH Setpoint	AV 100	20°F (-6.5°C)	55°F (13°C)	32°F (0.0°C)

Table 14. List of property value range restrictions for AI and AV objects (continued)

Object Name	Object Type and Instance	Under Range Value	Over Range Value	Default Value
Humidifier Output	AV 101	0%	100%	N/A

Table 15. List of property enumeration sets for BI and BV objects

Object Name	Object Type and Instance	Inactive_Text	Active_Text	Default Value
Room Temp Override	BV 8	Normal	Override	Normal
Outdoor Temp Override	BV 10	Normal	Override	Normal
AUX	BI 24	Off	On	Off
G Fan	BI 25	Off	On	Off
Y1 Cool	BI 26	Off	On	Off
Y2 Cool	BI 27	Off	On	Off
W1 Heat	BI 28	Off	On	Off
W2 Heat	BI 29	Off	On	Off
Reversing Valve	BI 30	Off	On	Off
DI 1 Status	BI 31	Not Activated	Activated	Not Activated
DI 2 Status	BI 32	Not Activated	Activated	Not Activated
Local Motion	BI 33	No Motion	Motion	No Motion
Frost Alarm	BI 36	Off	On	Off
Clock Alarm	BI 37	Off	On	Off
Filter Alarm	BI 38	Off	On	Off
Service Alarm	BI 39	Off	On	Off
Fan Lock Alarm	BI 40	Off	On	Off
Temperature Scale	BV 47	°C	°F	°F
Frost Protection	BV 55	Off	On	Off
Aux Contact	BV 56	N.O.	N.C.	N.O.
Menu Scroll	BV 57	No Scroll	Scroll Active	Scroll Active
Fan Control	BV 62	Off	On	On
Fan Purge Delay	BV 64	Off	On	Off
Progressive Recovery	BV 70	Off	Active	Off
Mechanical Cooling Enabled	BV 79	Off	On	Off
Comfort Mode	BV 84	Comfort	Economy	Comfort
Reversing Valve Configuration	BV 85	Normally Cool Energized in Heating	Normally Heat Energized in Cooling	Normally Heat Energized in Cooling
Compressor Interlock	BV 86	Off	On	Off
RH Display	BV 88	Disabled	Enabled	Disabled
Dehumidification Lockout Functions	BV 92	Disabled	Enabled	Enabled
Dehumidification Output Status	BI 93	Off	On	N/A

Table 16. List of property enumeration sets for MV objects

Object Name	Object Type and instance	BACnet Index	Text	Default Value
Occupancy Command	MV12	1	Local Occupancy	Local Occupancy
		2	Occupied	
		3	Unoccupied	
System Mode HPU	MV13	1	Off	Auto
		2	Auto	
		3	Cool	
		4	Heat	
		5	Emergency	
System Mode RTU	MV14	1	Off	Auto
		2	Auto	
		3	Cool	
		4	Heat	
Fan Mode	MV15	1	On	Smart
		2	Auto	
		3	Smart	
Keypad Lockout	MV18	1	Level 0	Level 0
		2	Level 1	
		3	Level 2	
Effective Occupancy	MV 34	1	Occupied	Depends on local occupancy
		2 3	Unoccupied	
		3	Temporary Occupied	
Heating CPH	MV53	1	3 CPH	4 CPH
		2	4 CPH	
		3	5 CPH	
		4	6 CPH	
		5	7 CPH	
		6	8 CPH	
Cooling CPH	MV54	1	3 CPH	4 CPH
		2	4 CPH	
Temporary Occupancy Time	MV61	1	0 hour	3 hours
		2	1 hour	
		3	2 hours	
		4	3 hours	
		5	4 hours	
		6	5 hours	
		7	6 hours	
		8	7 hours	
		9	8 hours	
		10	9 hours	
		11	10 hours	
		12	11 hours	
		13	12 hours	
Anticycle	MV63	1	0 minute	2 minutes
		2	1 minute	
		3	2 minutes	
		4	3 minutes	
		5	4 minutes	
		6	5 minutes	

Table 16. List of property enumeration sets for MV objects (continued)

Object Name	Object Type and instance	BACnet Index	Text	Default Value
DI1 Configuration	MV65	1	None	None
		2	RemNSB	
		3	RemOVR	
		4	Filter	
		5	Service	
		6	Fan lock	
DI2 Configuration	MV66	1	None	None
		2	RemNSB	
		3	RemOVR	
		4	Filter	
		5	Service	
		6	Fan lock	
Proportional Band	MV 67	1	2 2 F 0.6 C	2
		2	3 3 F 1.2 C	
		3	4 4 F 1.7 C	
		4	5 5 F 2.2 C	
		5	6 6 F 2.8 C	
		6	7 7 F 3.3 C	
		7	8 8 F 3.9 C	
Event Display	MV71	1	2 Events	2 Event
		2	4 Events	
Heating Stages	MV73	1	1 Stage	2 Stages
		2	2 Stages	
Cooling Stages	MV74	1	1 Stage	2 Stages
		2	2 Stages	
Heat Pump Stages	MV75	1	1 Stage	2 Stages
		2	2 Stages	

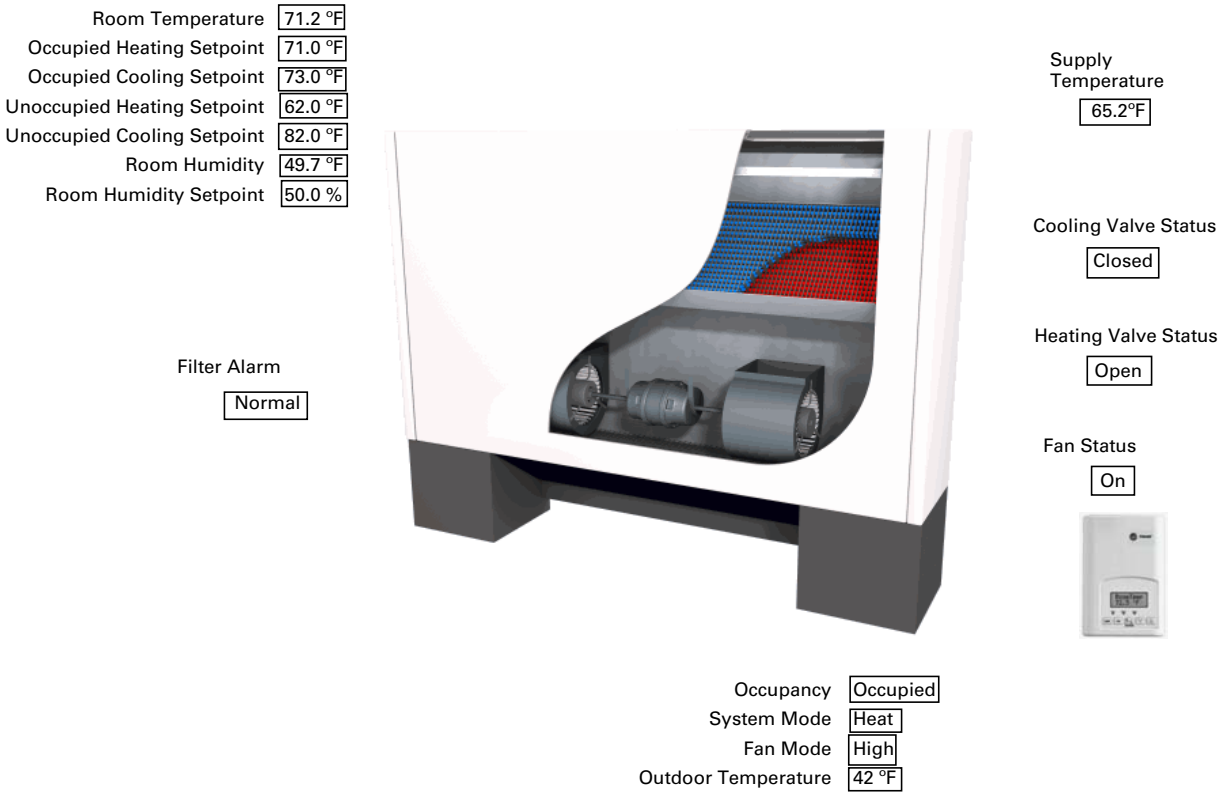
Objects You Can Use in Site Graphics

Fan Coils

You can use the following objects in site graphics:

- Room Temperature (AV7)
- Occupied and Unoccupied Heat Setpoints (AV39 and AV43)
- Occupied and Unoccupied Cool Setpoints (AV40 and AV34)
- Outdoor Temperature (AV9)
- Supply Temperature (AI12) (If available)
- Occupancy Command (MV18)
- System Mode (MV16)
- Room Humidity (AV10) (If available)
- Room Humidity Setpoint (AV71) (If available)
- Heating Valve Status (MV26)
- Cooling Valve Status (MV28)
- PI Heating Demand (AV21)
- PI Cooling Demand (AV22)
- Window Alarm (BI35)
- Filter Alarm (BI36)
- Service Alarm (BI37)
- Fan Mode (MV17)
- Fan Status (MV28)

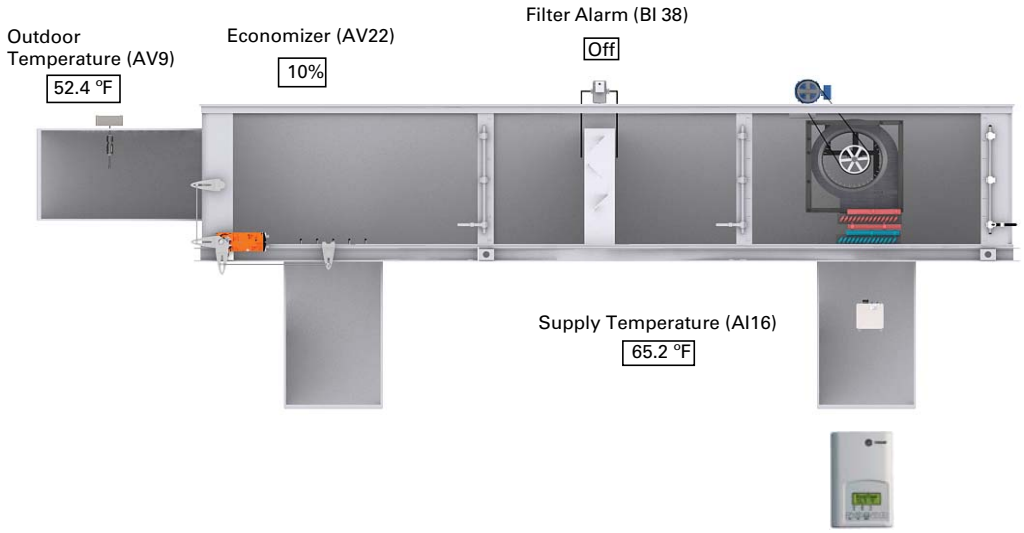
Figure 1. Sample Fan Coil Graphic



Rooftop and Heat Pump Units

You can use the following objects in site graphics:

- Room Temperature (AV7)
- Occupied and Unoccupied Heat Setpoints (AV 42 and AV44)
- Occupied and Unoccupied Cool Setpoints (AV 43 and AV45)
- Outdoor Temperature (AV9)
- Supply Temperature (AI16) (If available)
- Occupancy Command (MV12)
- Effective Occupancy (MV34)
- System Mode RTU (MV14) or System Mode HPU (MV13)
- G Fan (BI25)
- Y1 Cool (BI26)
- Y2 Cool (BI27)
- W1 Heat (BI28)
- W2 Heat (BI29) or Reversing Valve (BI30)
- Economizer Output (AV22) (if available)
- Aux (BI24)
- DI 1 Status (BI31)
- DI 2 Status (BI 32)
- Frost Alarm (BI36) (if available)
- Filter Alarm (BI38) (if available)
- Service Alarm (BI39) (if available)
- Fan Lock Alarm (BI40) (if available)



Room Temperature (AV7)	68.2 °F
Occupied Heat Setpoint (AV 42)	69.0 °F
Occupied Cool Setpoint (AV 43)	72.0 °F
Unoccupied Heat Setpoint (AV 44)	62.0 °F
Unoccupied Cool Setpoint (AV 45)	82.0 °F

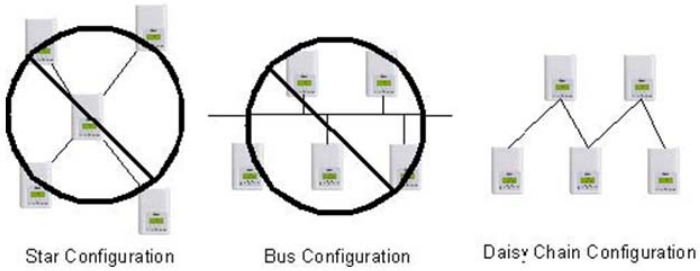
G Fan (BI25)	On
Y1 Cool (BI26)	Off
Y2 Cool (BI27)	Off
W1 Heat (BI28)	On
W2 Heat (BI29)	Off
Occupancy (MV12)	Occupied
System Mode RTU (MV14)	Heat
Aux (BI24)	On
DI 1 Status (BI31)	Off
DI 2 Status (BI 32)	Off
Frost Alarm (BI36)	Off
Service Alarm (BI39)	Off

Wiring Requirements for Communicating Thermostats

BACnet networks use a daisy chain configuration. A daisy chain means that there is only one main cable and every network device is connected directly along its path.

Figure 2 illustrates two improper network configurations and the proper daisy chain configuration.

Figure 2. Incorrect and correct network configurations



BACnet MS/TP Link Wiring

BACnet MS/TP link wiring must be field-supplied and installed in compliance with the National Electric Code (NEC) and local codes.

BACnet Configuration Requirements

- Follow these configuration requirements:
- BACnet wiring must use daisy-chain configuration. Maximum length is 4,000 ft (1219 m).
- BACnet links are polarity sensitive; consistent wiring polarity must be maintained between devices.
- Limit each link to 30 controllers or 60 total controllers per Tracer SC.

BACnet Wiring Best Practices

The following wiring practices are recommended:

- Use 18 AWG, (24 pF/ft. max.), shielded, twisted pair communication wire (Trane purple wire).
- Strip no more than 2 in. (5 cm) of the outer conductor of shielded wire.
- Avoid sharing 24 Vac power between unit controllers.
- Ensure that 24 Vac power supplies are consistently grounded. If grounds are not maintained, intermittent or failed communication could result.
- Connect the shield portion of the communication wire at the first unit controller in the link.
- Use a Tracer BACnet terminator at each end of the link.

For additional best practices, see the *Unit Controller Wiring Guide For the Tracer SC™ System Controller* (BAS-SVN03*x*-EN).

BACnet Wiring Procedure

Follow these steps to connect communication wiring as shown in Figure 3, p. 26.

1. Attach the communication link wiring to the Tracer SC at Link 1 or Link 2.

   Note: *It is not necessary to place the Tracer SC at the end of the of the communication link.*

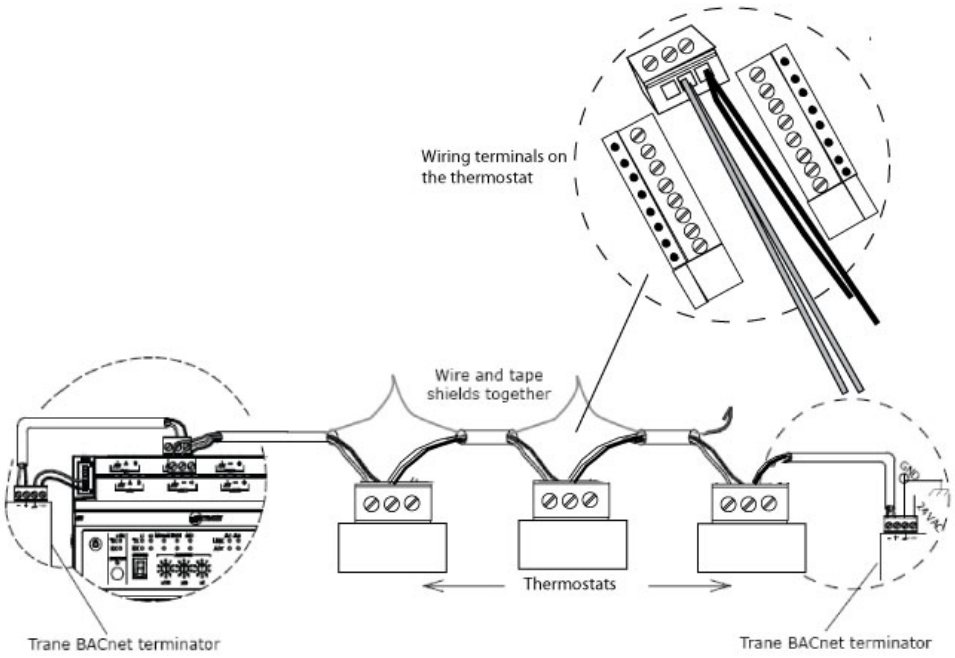
2. Attach the wiring from the first unit controller to the first set of communication terminals on the next unit controller.

   Note: *Some unit controllers have only one set of communication terminals. In that case, attach the wiring to the same set of terminals.*

3. Wire and tape shields together at each unit controller between the Tracer SC and the BACnet terminator.
4. Repeat steps 1 through 3 for each unit controller on the link.

   Note: *For more information about the specific unit controller you are wiring, see the Installation Guide for the specific controller.*

Figure 3. Daisy chain configuration for BACnet wiring

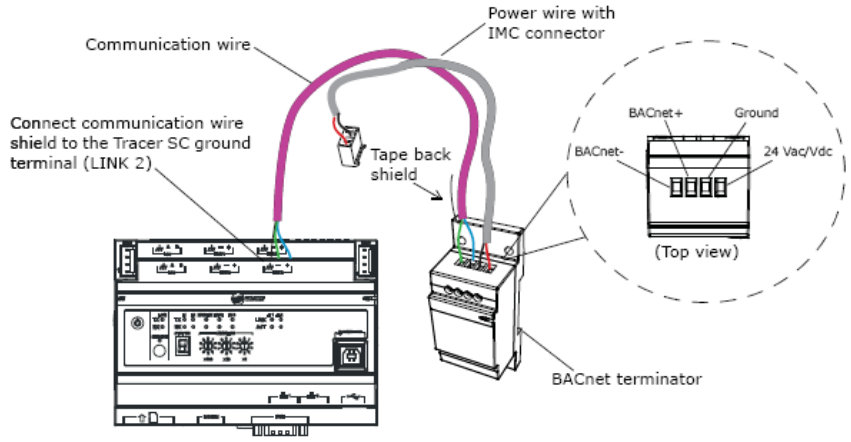


Trane BACnet Termination for BACnet Links

For correct termination placement, follow these guidelines:

- All BACnet links must be properly terminated. Use a Tracer BACnet terminator at each end of the link.
- Connect the communication wire shield to the ground terminal of the link termination block at the Tracer SC as shown in Figure 2. The Tracer SC provides the ground for the BACnet/MSTP link.
- Tape back the shield at each of the BACnet terminators.
- During installation, compile a set of as-built drawings or a map of the communication wire layout. Sketches of the communication layout should feature the BACnet terminators.

Figure 4. Terminating BACnet links using BACnet terminators



Product Specifications

Specifications for Communicating Thermostats are as follows.

Table 17. Communicating Thermostat Specifications

Item	Details
Media	Twisted pair 22AWG-24 AWG, shielded recommended
Characteristic Impedance	100-130 ohms
Distributed capacitance	Less than 100 pF per meter (30 pF per foot)
Maximum length per segment	1200 meters (4000 feet) Note: AWG 18 cable
Polarity	Polarity sensitive
Multi-drop	Daisy-chain (no T connections)
Terminations	Always use Trane BACnet terminators at each end of the link.
Maximum number of nodes per segment	30
Baud rate	9600, 19200, 38400, 76800 (Auto detect)

Network Adapter

The polarity of the connection to the cable is important. From one module to the other it is important that the same colored wire be connected to “plus” or “+” and the other colored wire be connected to the “minus” or ”-“.

Important: *The Ref terminal should NEVER be used to wire shields. The 2 shields from each feed of the network connection to a thermostat should be wired together in the back of the thermostat and properly protected to prevent any accidental connection to the ground.*

The joined shield connection should then be grounded at a SINGLE point on the whole segment. More than one ground connection to a shielded wire may induce ground loop noises and affect communication.

Communicating Thermostat Status LEDs

Table 18 shows the different possibilities with the Status LED behaviour for a BACnet module.

Table 18. Status LED conditions with causes and possible solutions (fan coil)

Condition of the Status LED	Possible Cause	Solution
1 short blink	BACnet communication NOT active at default MAC address = 254	Change MAC address to another value from 0 to 127
2 short blinks (no wires connected to the module)	Normal operation until BACnet link is connected.	N/A
2 short blinks (wires connected to the module)	Thermostat is not at the same baud rate as the network	Power off and on the thermostat
2 short blinks and a longer blink (wires connected to the module)	The thermostat has detected the presence of a network	N/A
Right after power is applied: 2 long blinks and then no blinking	Polarity has been reversed at the thermostat.	Reverse polarity at the thermostat

Troubleshooting

Table 19. Causes and solutions for error condition

Error / Trouble Condition	Possible Cause	Solution
Thermostat does not come online	Two or more controllers have the same MAC address.	Modify each duplicate address to a unique number.
	The MS/TP network has too many devices.	Do not exceed the maximum number of devices and maximum length allowed by the EIA-485 specifications.
	Too many devices were installed without any repeaters.	Repeaters need to be installed as specified in this document.
	The MS/TP cable runs are broken	Locate the break and correct wiring
	MS/TP connections at the module are reversed	Respect polarity of the wires on a MS/TP network.
	The thermostat does not have power	Apply power to the thermostat

Additional Information and Considerations

This chapter explains some special tips and considerations that apply to the Trane Communicating Thermostats. These tips and considerations are grouped in the following categories:

- MS/TP network integration
- Objects and parameters
- Tracer SC network configuration

MS/TP Network Integration

Before doing any BACnet integration, make sure to have Trane PICS (Protocol Implementation Conformance Statement). This PICS document lists all the BACnet Services and Object types supported by a device and can be found on the Trane portal.

The Trane Communicating Thermostats do not support the Change of Value (COV) service. COV reporting allows an object to send out notices when its Present-Value property is incremented by a pre-defined value. Since this is not supported at the thermostat, you should pay special attention to the polling time settings at the Supervisory Controller and Workstation level when using a graphical interface or an application program to read or write to the BACnet objects.

Site Graphics

For example, some site graphics might poll every data item linked to the graphic page on a COV basis. If the third party device does not support COV, the graphic interface then relies on a pre-configured polling interval, which is usually in hundredths of milliseconds. Any device containing a monitored object could be subject to network traffic congestion if such a polling interval is used. Trane strongly recommends a polling interval of 5 seconds or more for any graphic interface. This becomes even more critical in area graphics where a single representation might poll many devices. If proper poll rate is not respected, devices may be reported offline by certain front ends by saturating the traffic handling capacity of BACnet MS/TP without COV subscription.

Free Programmed Objects or Loops (Supervisory Controllers Other Than Tracer SC)

As for the application program, you might want to read and write any MS/TP data on an “If Once” basis or a “Do Every” loop basis instead of reading or writing to a third party device’s object directly in the program. Otherwise, any read or write request will occur at the Supervisory Controller’s program scan rate, which might be in hundredths of milliseconds. This can easily bog down a network as single commands can be sent to all ASC devices down the MS/TP trunks every hundredth of a millisecond.

Fan Coils

Programs writing to the devices should have a structure similar to the following:

```
If Once Schedule = On then
  MV13 = Occupied
End If
If Once Schedule = Off
Then
  MV13 = Unoccupied
End If
```

OR

```
Do Every 5min
 If Schedule = On Then
  MV13= Occupied
Else
  MV13 = Unoccupied
 End If
End Do
```

Rooftop and Heat Pump Units

Programs writing to the devices should have a structure similar to the following:

```
If Once Schedule = On then
  MV11 = Occupied
End If
If Once Schedule = Off
Then
  MV11 = Unoccupied
End If
```

OR

```
Do Every 5min
 If Schedule = On Then
  MV11= Occupied
Else
  MV11 = Unoccupied
 End If
End Do
```

Retries and Timeouts (Supervisory Controllers Other Than Tracer SC)

Another thing to look for in a BACnet integration is the Device object of the Supervisory Controller (and the Operator's Workstation). This object contains the 2 following required properties:

- Retry Timeout
  The Retry Timeout property specifies the time between re-transmissions if the acknowledgement has not been received. When you are experiencing problems with controllers dropping off-line, increasing this value may help.
- Number of APDU Retries;
  The Number of APDU Retries property specifies the number of times unsuccessful transmissions will be repeated. If the receiving controller has not received the transmission successfully after this many attempts, no further attempts will be made.

For example, if one of the thermostats does not reply to a Supervisory Controller (Tracer SC) request, and the Retry Timeout is set to 2000 msec and the Number of APDU Retries is set to 1 (still at the Tracer SC level), then the Tracer SC will send one other request, 2 seconds later. If the MS/TP device does not reply, it will be considered Off-line by the workstation.

So having a Retry Timeout value of 10000 msec and a Number of APDU Retries property set to 3 at the SC level may prevent device from dropping Off-line. These properties should also be changed at the Workstation level since the workstation will likely issue requests to any MS/TP devices when the graphics are used.

Objects and Parameters

The following items apply to all equipment types.

- Each thermostat is delivered from the factory with the default MAC address set at 254. At this value, the BACnet communication is NOT active and the device will not participate in the token pass either. The local LED status (located on the backside of the board) is one short flash only. To enable the BACnet communication, set the local MAC address configuration property of the thermostat to any valid value from 0 to 127 using the Installer Configuration Parameter menuon the Thermostat. (Refer to the *Trane Communicating Thermostats for Heat Pump Control User Guide* (BAS-SVU10A-EN)*, Trane Communicating Thermostats for Rooftop Control User Guide* (BAS-SVU11A-EN), or the *Trane Communicating Thermostats for Fan Coil Control User Guide* (BAS-SVU12A-EN) for details.)
- All configuration objects are available and can be edited locally from the device itself using the local configuration routine. (See the *Communicating Thermostat User Guides* mentioned previously in this section or in "Related Documents," p. 6.)
- In its default mode of operation, the device will automatically match its baud rate to the baud rate of the network. Automatic baud rate detection will occur when the MS/TP communication port is initialized (on power up). If the network speed is changed, the device will keep listening at the previously detected speed for 10 minutes before resuming automatic baud rate detection. Re-powering the devices will force immediate auto-detection.

- If the device should go offline, the communicated value from the front-end Tracer SC will be released:
  - Room Temperature
  - Outdoor Temperature
  - Occupancy
- Device Name and Device ID properties are writable in BACnet device object. Both properties can be renamed from any BACnet network management tool as long as the tool itself give access to write to these properties.
- The BACnet Data Link layer has two key parameters: the device object name and the device object ID. The device object name must be a unique BACnet device object name within the BACnet network (i.e. not just the MS/TP sub-network). The device object ID must also be a unique BACnet device object ID in the entire BACnet network (i.e. not just the MS/TP sub-network).

The following items apply to fan coils only.

- Enumeration sets for System Mode MV16 depends on Sequence of Operation (MV15) value upon device discovery. If required enumerations are not present, set MV15 to desired value and rediscover MV16 object. Available enumeration will now reflect required configuration.
- Enumeration sets for MV16 depends on Fan Mode Sequence (MV58) value upon device discovery. If required enumerations are not present, set MV58 to desired value and rediscover MV16 object. Available enumeration will now reflect required configuration.
- Enumeration sets for MV26 and MV27 depend on Control Type (BV75) value and Pipe Number (MV52) value upon device discovery. If required enumeration is not present, set BV75 and MV52 to desired value and rediscover MV26 and BV27 object. Available enumeration will now reflect required configuration.
- To assign manually a Room Temperature (AV7) value, users must first enable the Override mode in the Room Temp Override (BV8) object.
- To assign manually a Room Humidity (AV10) value, users must first enable the Override mode in the Room Humidity Override (BV11) object.

Tracer SC Network Configuration

You should be aware of these important facts about Communicating Thermostat capabilities in the Tracer SC network.

No automatic installation

The Trane Communicating Thermostats do not automatically install on the Tracer SC. Custom templates are available and you can select one of these templates ("Template: TStat_RTU_Trane," p. 40, "Template: TStat_FanCoil_Trane," p. 36, or "Template: TStat_HeatPump_Trane," p. 39) to get the unit ready to install. Refer to the *Tracer™ SC System Controller Installation and Setup Manual (BAS-SVX31x-EN)* for details about using a template to install a Communicating Thermostat on a BACnet link.

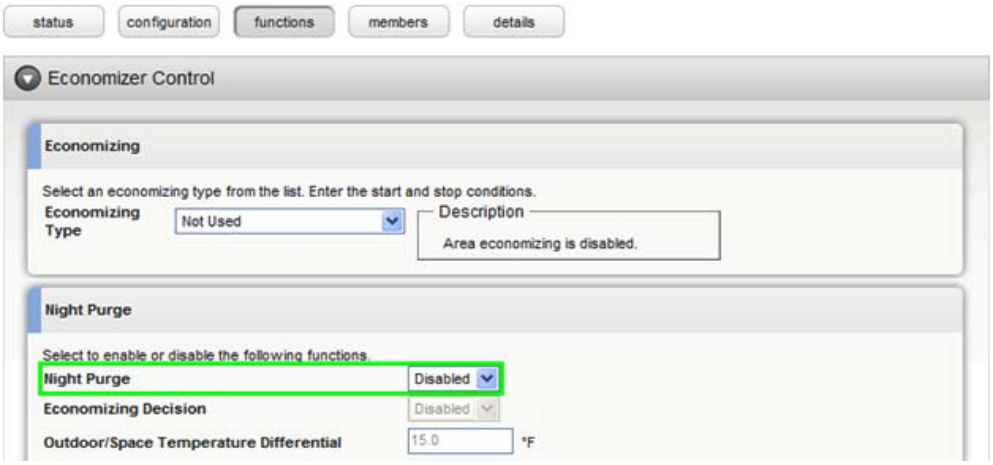
No priority array

Binary, Analog, and Multistate Values do not use a priority array. In order to reliably control these points, they must be controlled by only one source (for example, Area control). If they are being controlled from multiple sources, the most recent source to control the point will be in control.

Night Purge disabled

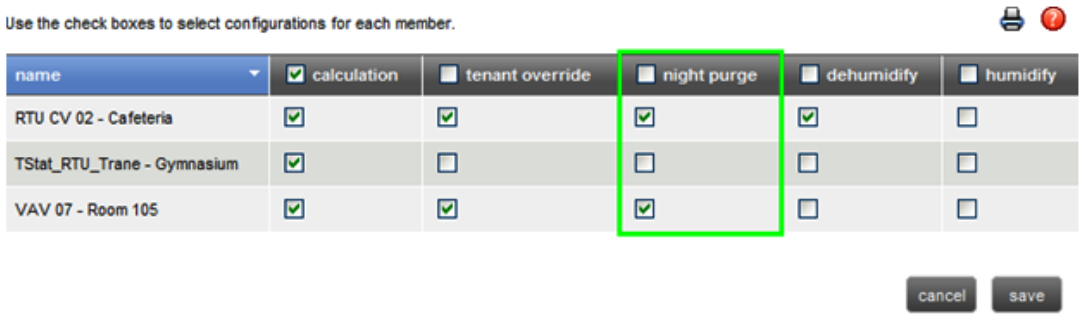
A Trane Communicating Thermostat as a member of Area should have Night Purge disabled. Using Night Purge could result in the Heat Cool Mode Request being controlled incorrectly on a transition from Night Purge to another state. You can disable Night Purge for the entire area on the functions page of Area in the Economizer Control section (Figure 5).

Figure 5. The Economizer Control section of the Area Functions page



Night purge can also be disabled from the members page by checking the box next to certain members and going to **actions > edit configuration** (Figure 6).

Figure 6. Area members page (actions > edit configuration)



Heat only/cool only

If the thermostat is configured as cool only, it will not accept its Heat Cool Mode Request to be controlled to any heating mode. The converse applies if the thermostat is configured for heat only, it will not accept its Heat Cool Mode Request to be controlled to any cooling mode. If the point is controlled to an invalid state, it will quickly revert to the previous state.

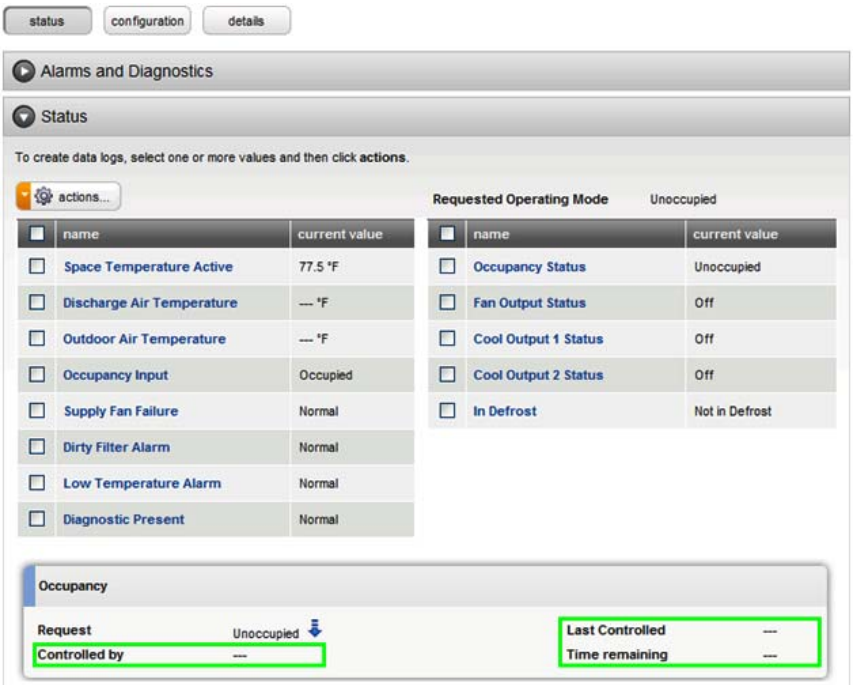
Parameters not supported

In the Occupancy frame of the Equipment/Space status page, the following properties will not be displayed:

- Last Controlled
- Controlled by
- Time Remaining

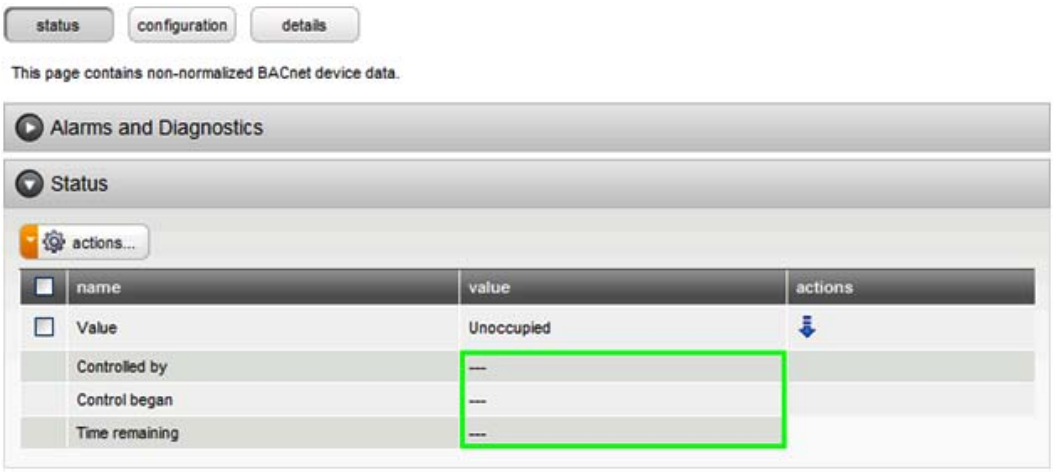
These are parameters that the thermostat points do not support.

Figure 7. Occupancy section of the Equipment/Space status page



These properties are also shown but not populated on point status pages (Figure 8, p. 34).

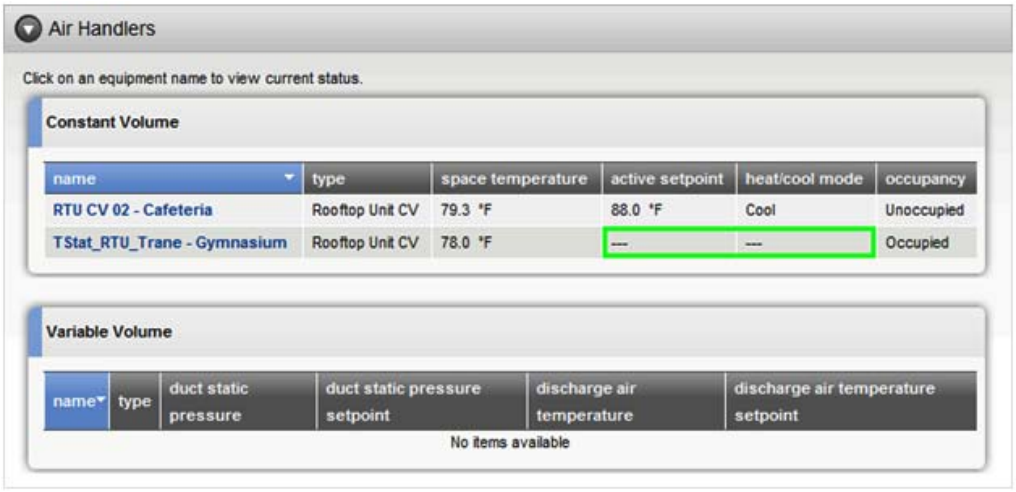
Figure 8. Status section of the Point Status page



No active setpoint or heat/cool mode data

The Spaces Summary and Equipment Summary pages do not show data for active setpoint or heat/cool mode as these devices do not have Space Temperature Setpoint Active and Heat Cool Mode Status points ( ).

Figure 9. Air Handlers section of the Equipment Status page



Discharge air temp requirements

The point Discharge Air Temperature on all of these devices only reports data if the respective input is configured as a discharge air sensor and a valid sensor is connected.

Inappropriate text on graphic displays

In some cases, Binary and Multistate points on a Tracer SC custom graphic display state text that does not match the space or equipment pages.

Outdoor air temperature

On the TStat_FanCoil, the point Outdoor Air Temperature is only controlled from a BAS. It is not used in the control sequence of the device. If this value is to be shown on the LCD display on the thermostat, it's recommended to use global referencing to send the Facility Outdoor Air Temperature to this point.

Data Normalization

Special data normalization has been applied to various points in the factory loaded equipment templates. This data normalization serves to make a consistent interface to equipment across Tracer SC. This chapter lists special data normalizations for each equipment template.

Example: Occupancy Request

The following example of the Occupancy Request point in the TStat_FanCoil_Trane template indicates how to interpret the special data normalization.

- The point name in Tracer SC is **Occupancy Request**.
- The point name in the BACnet device is **Occupancy Command** (Multistate Value instance 18 (MV18)).

Table 20 and Table 21 show the corresponding Tracer SC and fan coil states.

When Tracer SC writes the state in the left hand column to the Occupancy Request point, the BACnet point is controlled to the corresponding state on the right hand column.

Table 20. Tracer SC writing to the fan coil (Occupancy Request)

Tracer SC state and text	Fan coil state and text
1 - Occupied	2 - Occupied
2 - Unoccupied	3 - Unoccupied
3 - Occupied Bypass	2 - Occupied
4 - Occupied Standby	2 - Occupied
5 - Auto	1 - Local Occupancy

When Tracer SC reads the state and text in the left hand column from the BACnet device, it reports the state and text in the right hand column in the Occupancy Request point.

Table 21. Reading from Fan Coil to Tracer SC (Occupancy Request)

Fan Coil state and text	Tracer SC state and text
1 - Local Occupancy	5 - Auto
2 - Occupied	1 - Occupied
3 - Unoccupied	2 - Unoccupied

Template: TStat_FanCoil_Trane

This section lists special data normalizations for points in this template.

The Tracer SC Point name: **Occupancy Status**

The BACnet point name, type, and instance: **Effective Occupancy** (MV 33)

Table 22. Tracer SC writing to the fan coil (Occupancy Status)

Tracer SC state and text	Fan coil state and text
1 - Occupied	1 - Occupied
2 - Unoccupied	2 - Unoccupied
3 - Occupied Bypass	1 - Occupied
4 - Occupied Standby	4 - Stand-by
5 - Auto	1 - Occupied

Table 23. Reading from fan coil to Tracer SC (Occupancy Status)

Fan Coil state and text	Tracer SC state and text
1 - Occupied	1 - Occupied
2 - Unoccupied	2 - Unoccupied
3 - Temporary Occupied	1 - Occupied
4 - Stand-by	4 - Occupied Standby

Tracer SC point name: **Occupancy Request**

BACnet point name, type, and instance: **Occupancy Command** (MV 18)

Table 24. Tracer SC writing to the fan coil (Occupancy Request)

Tracer SC state and text	Fan coil state and text
1 - Occupied	2 - Occupied
2 - Unoccupied	3 - Unoccupied
3 - Occupied Bypass	2 - Occupied
4 - Occupied Standby	2 - Occupied
5 - Auto	1 - Local Occupancy

Table 25. Reading from fan coil to Tracer SC (Occupancy Request)

Fan coil state and text	Tracer SC state and text
1 - Local Occupancy	5 - Auto
2 - Occupied	1 - Occupied
3 - Unoccupied	2 - Unoccupied

Tracer SC Point name: **Heat Cool Mode Request**

BACnet point name, type and instance: **System Mode** (MV 16)

Table 26. Tracer SC writing to the fan coil (Heat Cool Mode Request)

Tracer SC state and text	Fan coil state and text
1 - Auto	2 - Auto
2 - Heat	4 - Heat
3 - Morning Warm-up	4 - Heat
4 - Cool	3 - Cool
5 - Night Purge	3 - Cool
6 - Pre Cool	3 - Cool
7 - Off	1 - Off
8 - Test	2 - Auto
9 - Emergency Heat	4 - Heat
10 - Fan Only	2 - Auto
11 - Free Cool	3 - Cool
12 - Ice-Making	3 - Cool
13 - Max Heat	4 - Heat
14 - Economizer	3 - Cool
15 - Dehumidify	3 - Cool
16 - Calibrate	2 - Auto

Table 27. Reading from fan coil to Tracer SC (Heat Cool Mode Request)

Fan coil state and text	Tracer SC state and text
1 - Off	7 - Off
2 - Auto	1 - Auto
3 - Cool	4 - Cool
4 - Heat	2 - Heat

Tracer SC Point name: **Supply Fan Staged Speed Status**

BACnet point name, type, and instance: **Fan Status** (MV 28)

Table 28. Tracer SC writing to the fan coil (Supply Fan Staged Speed Status)

Tracer SC state and text	Fan coil state and text
1 - Auto	4 - High
2 - Off	1 - Off
3 - Low	2 - Low
4 - Medium	3 - Medium
5 - High	4 - High

Table 29. Reading from fan coil to Tracer SC (Supply Fan Staged Speed Status)

Fan coil state and text	Tracer SC state and text
1 - Off	2 - Off
2 - Low	3 - Low
3 - Medium	4 - Medium
4 - High	5 - High

Tracer SC Point name: **Fan Mode BAS**

BACnet point name, type, and instance: **Fan Mode** (MV 17)

Table 30. Tracer SC writing to the fan coil (Fan Mode BAS)

Tracer SC state and text	Fan coil state and text
1 - On	2 - On
2 - Auto	1 - Auto
3 - Smart	1 - Auto

Table 31. Reading from fan coil to tracer SC (Fan Mode BAS)

Fan Coil state and text	Tracer SC state and text
1 - Auto	2 - Auto
2 - On	1 - On

Template: TStat_HeatPump_Trane

This section lists special data normalizations for points in this template.

- Tracer SC Point name: **Occupancy Status**
- BACnet point name, type, and instance: **Effective Occupancy** (MV 34)

Table 32. Tracer SC writing to the heat pump (Occupancy Status)

	Heat pump state and text
1 - Occupied	1 - Occupied
2 - Unoccupied	2 - Unoccupied
3 - Occupied Bypass	1 - Occupied
4 - Occupied Standby	1 - Occupied
5 - Auto	1 - Occupied

Table 33. Reading from heat pump to Tracer SC (Occupancy Status)

Heat pump state and text	Tracer SC state and text
1 - Occupied	1 - Occupied
2 - Unoccupied	2 - Unoccupied
3 - Temporary Occupied	1 - Occupied

Tracer SC Point name: **Occupancy Request**

BACnet point name, type and instance: **Occupancy Command** (MV 12)

Table 34. Tracer SC writing to the heat pump (Occupancy Request)

Tracer SC state and text	Heat pump state and text
1 - Occupied	2 - Occupied
2 - Unoccupied	3 - Unoccupied
3 - Occupied Bypass	2 - Occupied
4 - Occupied Standby	2 - Occupied
5 - Auto	1 - Local Occupancy

Table 35. Reading from heat pump to Tracer SC (Occupancy Request)

Heat pump state and text	Tracer SC state and text
1 - Local Occupancy	5 - Auto
2 - Occupied	1 - Occupied
3 - Unoccupied	2 - Unoccupied

Tracer SC Point name: **Heat Cool Mode Request**

BACnet point name, type and instance: **System Mode** (MV 13)

Table 36. Tracer SC writing to the heat pump (Heat Cool Mode Request)

Tracer SC state and text	Heat pump state and text
1 - Auto	2 - Auto
2 - Heat	4 - Heat
3 - Morning Warm-up	4 - Heat
4 - Cool	3 - Cool
5 - Night Purge	3 - Cool
6 - Pre Cool	3 - Cool
7 - Off	1 - Off
8 - Test	2 - Auto
9 - Emergency Heat	5 - Emergency
10 - Fan Only	2 - Auto
11 - Free Cool	3 - Cool
12 - Ice-Making	3 - Cool
13 - Max Heat	4 - Heat
14 - Economizer	3 - Cool
15 - Dehumidify	3 - Cool
16 - Calibrate	2 - Auto

Table 37. Reading from Heat Pump to Tracer SC (Heat Cool Mode Request)

Heat pump state and text	Tracer SC state and text
1 - Off	7 - Off
2 - Auto	1 - Auto
3 - Cool	4 - Cool
4 - Heat	2 - Heat
5 - Emergency	9 - Emergency Heat

Template: TStat_RTU_Trane

This section lists special data normalizations for points in this template.

Tracer SC Point name: **Occupancy Status**

BACnet point name, type, and instance: **Effective Occupancy** (MV 34)

Table 38. Tracer SC writing to the rooftop unit (Occupancy Status)

Tracer SC state and text	Rooftop unit state and text
1 - Occupied	1 - Occupied
2 - Unoccupied	2 - Unoccupied
3 - Occupied Bypass	1 - Occupied
4 - Occupied Standby	1 - Occupied
5 - Auto	1 - Occupied

Table 39. Reading from rooftop unit to Tracer SC (Occupancy Status)

Rooftop unit state and text	Tracer SC state and text
1 - Occupied	1 - Occupied
2 - Unoccupied	2 - Unoccupied
3 - Temporary Occupied	1 - Occupied

Tracer SC Point name: **Occupancy Request**

BACnet point name, type, and instance: **Occupancy Command** (MV 12)

Table 40. Tracer SC writing to the rooftop unit (Occupancy Request)

Tracer SC state and text	Rooftop unit state and text
1 - Occupied	2 - Occupied
2 - Unoccupied	3 - Unoccupied
3 - Occupied Bypass	2 - Occupied
4 - Occupied Standby	2 - Occupied
5 - Auto	1 - Local Occupancy

Table 41. Reading from rooftop unit to Tracer SC (Occupancy Request)

Rooftop unit state and text	Tracer SC state and text
1 - Local Occupancy	5 - Auto
2 - Occupied	1 - Occupied
3 - Unoccupied	2 - Unoccupied

Tracer SC Point name: **Heat Cool Mode Request**

BACnet point name, type and instance: **System Mode** (MV 14)

Table 42. Tracer SC writing to the rooftop unit (Heat Cool Mode Request)

Tracer SC state and text	Rooftop unit state and text
1 - Auto	2 - Auto
2 - Heat	4 - Heat
3 - Morning Warm-up	4 - Heat
4 - Cool	3 - Cool
5 - Night Purge	3 - Cool
6 - Pre Cool	3 - Cool
7 - Off	1 - Off
8 - Test	2 - Auto
9 - Emergency Heat	4 - Heat
10 - Fan Only	2 - Auto
11 - Free Cool	3 - Cool
12 - Ice-Making	3 - Cool
13 - Max Heat	4 - Heat
14 - Economizer	3 - Cool
15 - Dehumidify	3 - Cool
16 - Calibrate	2 - Auto

Table 43. Reading from rooftop unit to Tracer SC (Heat Cool Mode Request)

Rooftop unit state and text	Tracer SC state and text
1 - Off	7 - Off
2 - Auto	1 - Auto
3 - Cool	4 - Cool
4 - Heat	2 - Heat

Trane Communicating Thermostat Points List

The following tables provide side by side lists of Tracer SC points and Communicating Thermostat device point names and related information.

TStat_Fan_Coil_Trane

Table 44. Points Available in the TStat_Fan_Coil_Trane Template

Tracer SC Point Name	TStat Device Point Name	Point Type	Point Instance	Data Normalization
Diagnostic Present	Service Alarm	BI	37	
Dirty Filter Alarm	Filter Alarm	BI	36	
Discharge Air Temperature	Supply Temperature	AI	12	
Display Temperature Scale	Temperature Scale	BV	51	
Emergency Heat Status	AUX Status	BI	25	
Fan Mode BAS	Fan Mode	MV	17	Yes
Heat Cool Mode Request	System Mode	MV	16	Yes
Keypad Lockout	Keypad Lockout	MV	19	
Minimum Heating Cooling Setpoint Differential	Deadband	AV	63	
Occupancy Input	Local Motion	BI	32	
Occupancy Request	Occupancy Command	MV	18	Yes
Occupancy Status	Effective Occupancy	MV	33	Yes
Occupied Cooling Setpoint	Occupied Cool Setpoint	AV	40	
Occupied Heating Setpoint	Occupied Heat Setpoint	AV	39	
Occupied Standby Cooling Setpoint	Stand-by Cool Setpoint	AV	42	
Occupied Standby Heating Setpoint	Stand-by Heat Setpoint	AV	41	
Outdoor Air Temperature	Outdoor Temperature	AV	9	
Space Temperature Active	Room Temperature	AV	7	
Supply Fan Staged Speed Status	Fan Status	MV	28	Yes
Timed Override Duration Setpoint	Temporary Occupancy Time	MV	62	
Unoccupied Cooling Setpoint	Unoccupied Heat Setpoint	AV	43	
Unoccupied Cooling Setpoint	Unoccupied Cool Setpoint	AV	44	
	PI Heating Demand	AV	21	
	PI Cooling Demand	AV	22	
	Password Value	AV	56	
	Heating Setpoint Limit	AV	58	
	Cooling Setpoint Limit	AV	59	
	Stand-by Time	AV	67	
	Unoccupied Time	AV	68	
	BI 1 Status	BI	29	
	BI 2 Status	BI	30	
	UI 3 Status	BI	31	
	Window Alarm	BI	35	
	Room Temp Override	BV	8	
	AUX Command	BV	14	
	Menu Scroll	BV	49	
	Auto Mode Enable	BV	50	
	Setpoint Type	BV	60	
	Setpoint Function	BV	61	
	Reheat Time Base	BV	64	
	Auto Fan	BV	66	
	Control Type	BV	75	
	Sequence of Operation	MV	15	
	Heating Valve Status	MV	26	

Table 44. Points Available in the TStat_Fan_Coil_Trane Template (continued)

Tracer SC Point Name	TStat Device Point Name	Point Type	Point Instance	Data Normalization
	Cooling Valve Status	MV	27	
	BI 1 Configuration	MV	46	
	BI 2 Configuration	MV	47	
	UI 3 Configuration	MV	48	
	Pipe Number	MV	52	
	AUX Configuration	MV	54	
	Fan Mode Sequence	MV	57	
	Proportional Band	MV	65	
	Floating Motor Timing	MV	76	
	On Off Control CPH	MV	77	

TStat_HeatPump_Trane Template

Table 45. Points Available in the TStat_HeatPump_Trane Template

Tracer SC Point Name	TStat Device Point Name	Point Type	Point Instance	Data Normalization
Cool Output 1 Status	Y1 Cool	BI	26	
Cool Output 2 Status	Y2 Cool	BI	27	
Diagnostic Present	Service Alarm	BI	39	
Dirty Filter Alarm	Filter Alarm	BI	38	
Discharge Air Temperature	Supply Temperature	AI	16	
Display Temperature Scale	Temperature Scale	BV	47	
Fan Mode BAS	Fan Mode	MV	15	
Fan Output Status	G Fan	BI	25	
Heat Cool Mode Request	System Mode HP	MV	13	Yes
Heat Output 1 Status	W1 Heat	BI	28	
In Defrost	Frost Protection	BV	55	
Keypad Lockout	Keypad Lockout	MV	18	
Low Temperature Alarm	Frost Alarm	BI	36	
Minimum Heating Cooling Setpoint Differential	Deadband	AV	52	
Occupancy Input	Local Motion	BI	33	
Occupancy Request	Occupancy Command	MV	12	Yes
Occupancy Status	Effective Occupancy	MV	34	Yes
Occupied Cooling Setpoint	Occupied Cool Setpoint	AV	43	
Occupied Heating Setpoint	Occupied Heat Setpoint	AV	42	
Outdoor Air Temperature	Outdoor Temperature	AV	9	
Reversing Valve	Reversing Valve	BI	30	
Space Temperature Active	Room Temperature	AV	7	
Supply Fan Configuration Command	Fan Control	BV	62	
Supply Fan Failure	Fan Lockout Alarm	BI	40	
Timed Override Duration Setpoint	Temporary Occupancy Time	MV	61	
Unoccupied Cooling Setpoint	Unoccupied Cool Setpoint	AV	45	
Unoccupied Heating Setpoint	Unoccupied Heat Setpoint	AV	44	
	PI Heating Demand	AV	20	
	PI Cooling Demand	AV	21	
	Heating Setpoint Limit	AV	48	
	Cooling Setpoint Limit	AV	49	

Table 45. Points Available in the TStat_HeatPump_Trane Template (continued)

Tracer SC Point Name	TStat Device Point Name	Point Type	Point Instance	Data Normalization
	Heating Lockout Temperature	AV	50	
	Cooling Lockout Temperature	AV	51	
	Password Value	AV	59	
	Power-up Delay	AV	60	
	Unoccupied Time	AV	68	
	High Balance Point	AV	82	
	Low Balance Point	AV	83	
	AUX	BI	24	
	DI 1 Status	BI	31	
	DI 2 Status	BI	32	
	Room Temp Override	BV	8	
	Outdoor Temp Override	BV	10	
	Aux Contact	BV	56	
	Menu Scroll	BV	57	
	Fan Purge Delay	BV	64	
	Comfort Mode	BV	84	
	Reversing Valve Configuration	BV	85	
	Compressor Interlock	BV	86	
	Heating CPH	MV	53	
	Cooling CPH	MV	54	
	Anticycle	MV	63	
	DI 1 Configuration	MV	65	
	DI 2 Configuration	MV	66	
	Proportional Band	MV	67	
	Heat Pump Stages	MV	75	

TStat_RTU_Trane Template

Table 46. Points Available in the TStat_RTU_Trane Template

Tracer SC Point Name	TStat Device Point Name	Point Type	Point Instance	Data Normalization
Cool Output 1 Status	Y1 Cool	**BI**	**26**	
Cool Output 2 Status	Y2 Cool	**BI**	**27**	
Diagnostic Present	Service Alarm	**BI**	**39**	
Dirty Filter Alarm	Filter Alarm	**BI**	**38**	
Discharge Air Temperature	Supply Temperature	**AI**	**16**	
Display Temperature Scale	Temperature Scale	**BV**	**47**	
Economizer Minimum Position Setpoint BAS	Economizer Minimum Position	**AV**	**78**	
Economizer Mixed Air Enable Setpoint BAS	Mixed Air Setpoint	**AV**	**80**	
Economizer Outdoor Air Enable Setpoint BAS	Economizer Changeover Setpoint	**AV**	**77**	
Fan Mode BAS	Fan Mode	**MV**	**15**	
Fan Output Status	G Fan	**BI**	**25**	
Heat Cool Mode Request	System Mode RTU	**MV**	**14**	**Yes**
Heat Output 1 Status	W1 Heat	**BI**	**28**	

Table 46. Points Available in the TStat_RTU_Trane Template (continued)

Tracer SC Point Name	TStat Device Point Name	Point Type	Point Instance	Data Normalization
Heat Output 2 Status	W2 Heat	**BI**	**29**	
In Defrost	Frost Protection	**BV**	**55**	
Keypad Lockout	Keypad Lockout	**MV**	**18**	
Low Temperature Alarm	Frost Alarm	**BI**	**36**	
Minimum Heating Cooling Setpoint Differential	Deadband	**AV**	**52**	
Occupancy Input	Local Motion	**BI**	**33**	
Occupancy Request	Occupancy Command	**MV**	**12**	**Yes**
Occupancy Status	Effective Occupancy	**MV**	**34**	**Yes**
Occupied Cooling Setpoint	Occupied Cool Setpoint	**AV**	**43**	
Occupied Heating Setpoint	Occupied Heat Setpoint	**AV**	**42**	
Outdoor Air Damper Position	Economizer Output	**AV**	**22**	
Outdoor Air Temperature	Outdoor Temperature	**AV**	**9**	
Space Temperature Active	Room Temperature	**AV**	**7**	
Supply Fan Configuration Command	Fan Control	**BV**	**62**	
Supply Fan Failure	Fan Lockout Alarm	**BI**	**40**	
Timed Override Duration Setpoint	Temporary Occupancy Time	**MV**	**61**	
Unoccupied Cooling Setpoint	Unoccupied Cool Setpoint	**AV**	**45**	
Unoccupied Heating Setpoint	Unoccupied Heat Setpoint	**AV**	**44**	
	PI Heating Demand	**AV**	**20**	
	PI Cooling Demand	**AV**	**21**	
	Heating Setpoint Limit	**AV**	**48**	
	Cooling Setpoint Limit	**AV**	**49**	
	Heating Lockout Temperature	**AV**	**50**	
	Cooling Lockout Temperature	**AV**	**51**	
	Password Value	**AV**	**59**	
	Power-up Delay	**AV**	**60**	
	Unoccupied Time	**AV**	**68**	
	AUX	**BI**	**24**	
	DI 1 Status	**BI**	**31**	
	DI 2 Status	**BI**	**32**	
	Room Temp Override	**BV**	**8**	
	Outdoor Temp Override	**BV**	**10**	
	Aux Contact	**BV**	**56**	
	Menu Scroll	**BV**	**57**	
	Fan Purge Delay	**BV**	**64**	
	Mechanical Cooling Enabled	**BV**	**79**	
	Heating CPH	**MV**	**53**	
	Cooling CPH	**MV**	**54**	
	Anticycle	**MV**	**63**	
	DI 1 Configuration	**MV**	**65**	
	DI 2 Configuration	**MV**	**66**	
	Proportional Band	**MV**	**67**	
	Heating Stages	**MV**	**73**	
	Cooling Stages	**MV**	**74**	

Notes

Notes

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