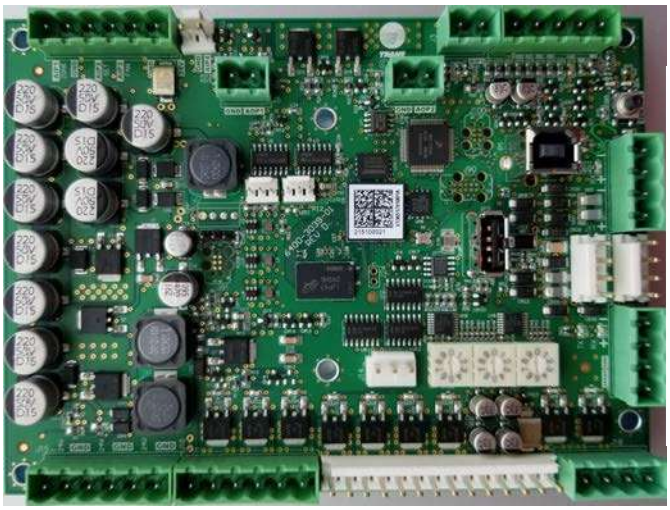
Integration Guide

Symbio™ 400–B/500 Programmable Controller

For Fan Coil, Blower Coil, and Unit Ventilator





⚠ 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.

October 2022

BAS-SVP060A-EN

Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.
NOTICE	Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants-including industry replacements for CFCs and HCFCs such as saturated or unsaturated HFCs and HCFCs.

Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

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⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠ WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- **All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.**
- **Non-Trane personnel should always follow local regulations.**

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BACnet® Protocol

The Building Automation and Control Network (BACnet®) protocol is ANSI/ASHRAE Standard 135. This standard 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. 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 defines standard objects (data points) called BACnet® objects. Each object has a defined list of properties that provide context information about that object. In addition, BACnet® defines a number of application services that are used to interact with objects in a BACnet® device.

BACnet Testing Laboratory (BTL) Certification

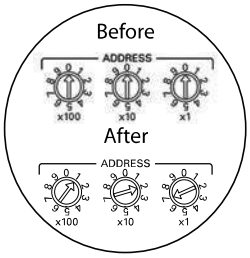
The Symbio 400–B/500 is BTL certified as a B-BC profile device. A complete list of Trane certified devices is available at www.bacnetinternational.org.

Symbio 400-B/500 Rotary Switches

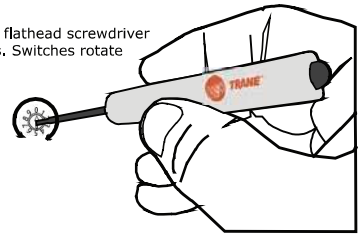
Rotary Switches

There are three (3) rotary switches on the front of the controller. They are used to set the BACnet network address and BACnet Device ID.

Important: *Each controller on the BACnet link must have a unique rotary switch value, otherwise communication problems will occur.*



Use a 1/8 in. (3 mm) flathead screwdriver to set rotary switches. Switches rotate in either direction.



Configuring the Symbio 400-B/500

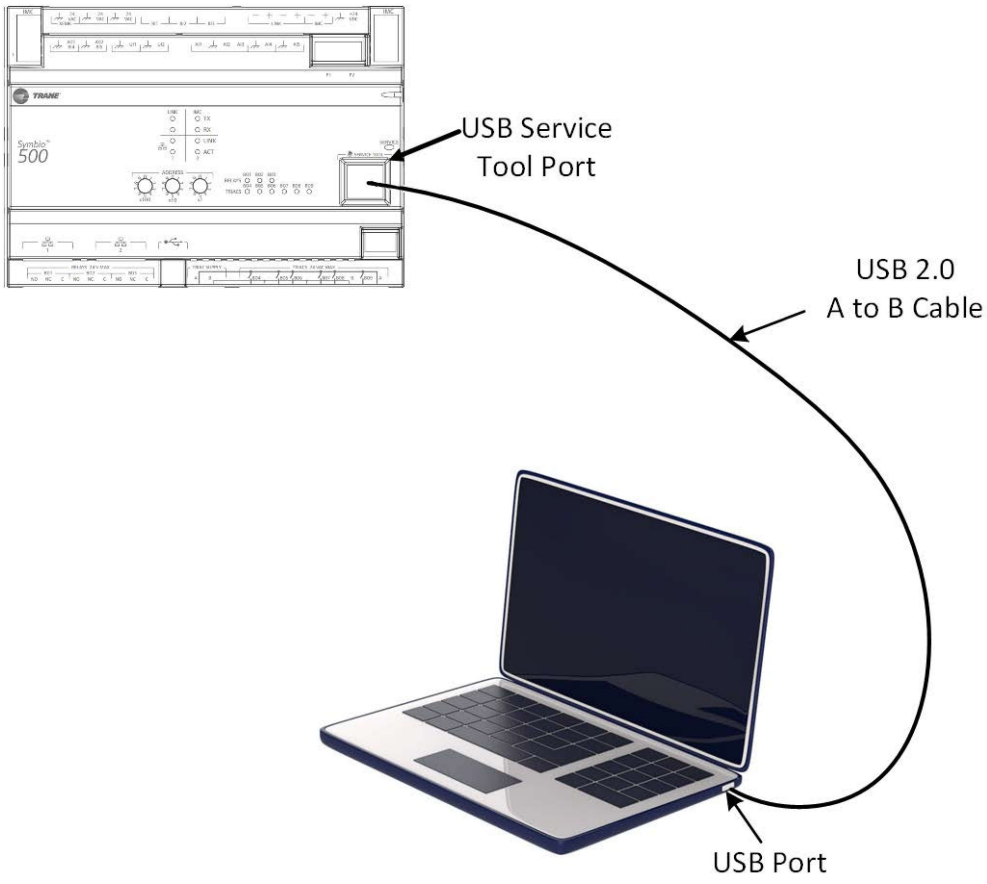
Using Symbio UI to Configure Settings

Symbio UI is a built-in web-based user interface that is used for basic setup and configuration of the Symbio 400–B/500. This interface replaces the need to use the BACnet Setup Tool to configure BACnet protocol settings and allows users to select BAS or local for the source on many sensors and setpoints on the equipment.

Connecting to Symbio UI

1. Connect a laptop to the USB service tool port using a USB 2.0 A to B cable. Symbio UI can only be accessed over USB connection.
2. Open a web browser and connect to http://198.80.18.1 to access Symbio UI.

Figure 1. Connecting to Symbio UI



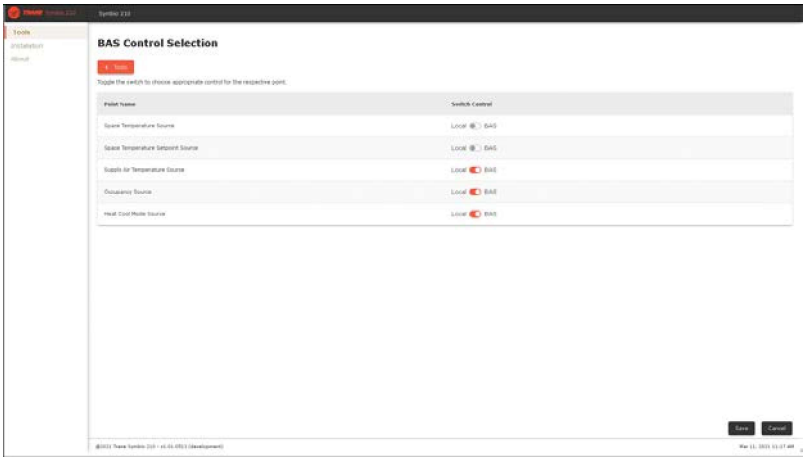
Configuring BAS Control Selection

Symbio UI allows users to select which sensors and setpoints use values communicated over the Building Automation System (BAS) vs using the local sensor. This can be selected for a varying number of sensors and setpoints depending on how the equipment is configured.

1. With Symbio UI open in a web browser navigate to the **Tools** menu on the left-hand navigation.
2. In the **Tools** menu select **BAS Control Selection** to open the selection tool.
3. In the **BAS Control Selection** tool use the toggle to select from BAS or Local as the source of information for the selected sensor or setpoint.

4. Select **Save** button in bottom right to save changes.

Figure 2. BAS Control Selection



Configuring Regional Specifications

Symbio UI allows users to set the date, time and time zone. IP based controllers will also have the ability to configure NTP server for time synchronization.

1. In Symbio UI, navigate to the **Installation** menu on the left-hand navigation.
2. Select **Regional Specifications**.
3. Select **Edit** to change the settings.
4. Fill in the date, time and time zone for the controller.
5. Select **Save** button in bottom right to save changes.

Figure 3. Regional Specifications



Configuring System Units

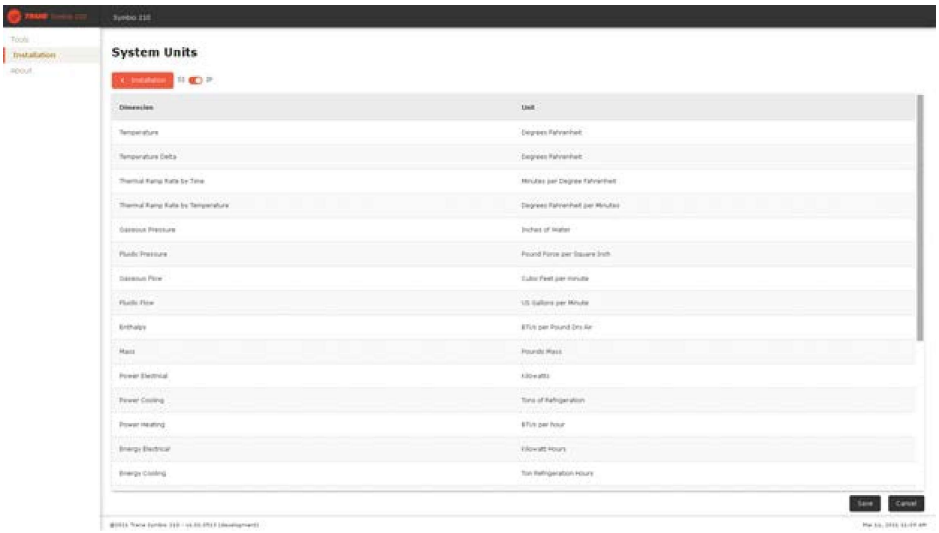
Symbio UI allows users to set the desired System Units of the controller. This will change the unit communicated over BACnet. Making changes to System Units will restart the controller and equipment will be inoperable for a brief period of time.

1. With Symbio UI open in a web browser, navigate to the **Installation** menu on the left-hand navigation.

2. In the **Installation** menu, select **System Units**.
3. In the **System Units** window, use the toggle at the top of the page to switch between Inch-Pound (IP) and System International (SI) units.
4. Select **Save** button in bottom right to save changes. Saving changes will restart the controller and equipment will be inoperable for a brief period of time.

Note: *It may not be possible to change the System Units because TGP2 programs exist that could not be converted. Tracer TU must be used to rectify this issue.*

Figure 4. System Units



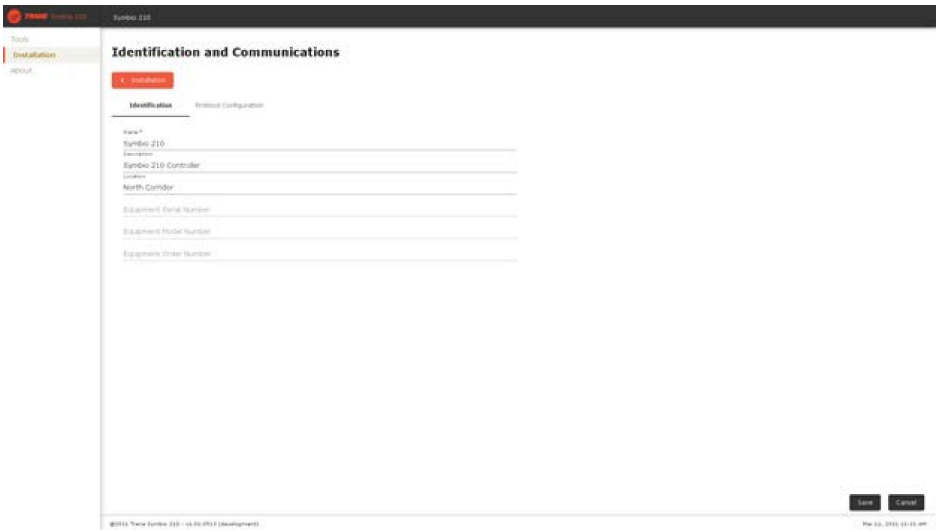
Configuring Identification and Communications

Symbio UI allows users to set the Name, Description, and Location of the controller as well as the communication protocol and associated settings.

Identification Settings:

1. With Symbio UI open in a web browser, navigate to the **Installation** menu on the left-hand navigation.
2. In the **Installation** menu, select **Identification and Communications**.
3. In the **Identification and Communications** window, select the **Identification** tab.
4. Use the **Edit** button at the top of the page to change the Name, Description, and Location fields.
5. Select **Save** button in bottom right to save changes.

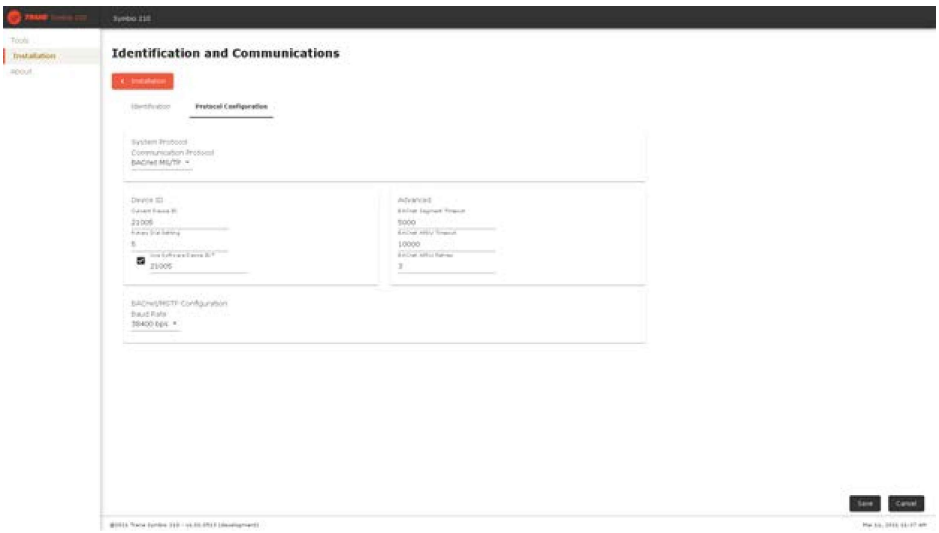
Figure 5. Identification and Communications



Protocol Settings:

1. With Symbio UI open in a web browser, navigate to the **Installation** menu on the left-hand navigation.
2. In the **Installation** menu, select **Identification and Communications**.
3. In the **Identification and Communications** window, select the **Protocol Configuration** tab.
4. Use the **Edit** button at the top of the page to change Protocol Settings.
5. Click **Save** in bottom right to save changes. Saving changes will restart the controller and equipment will be inoperable for a brief period of time.

Figure 6. Identification and Communications

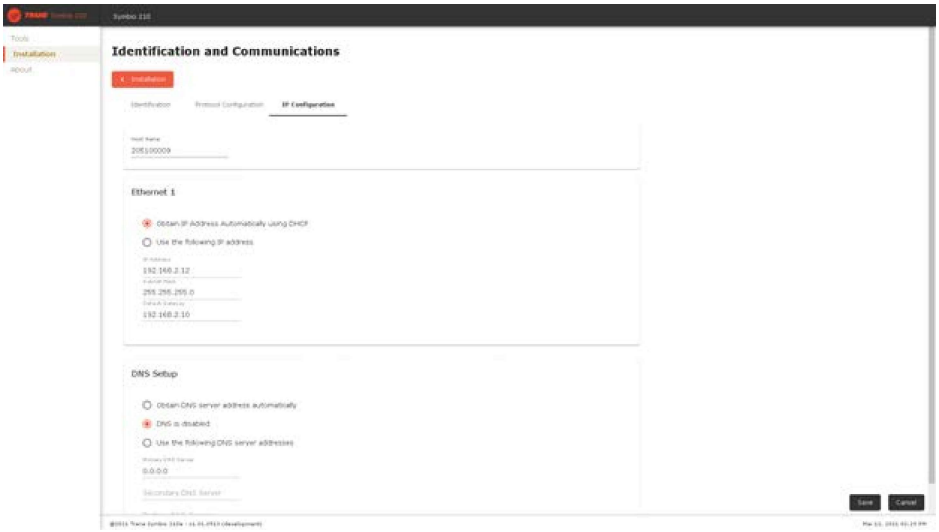


IP Settings:

1. With Symbio UI open in a web browser, navigate to the **Installation** menu on the left-hand navigation.
2. In the **Installation** menu, select **Identification and Communications**.
3. In the **Identification and Communications** window, select the **IP Configuration** tab.
4. Use the **Edit** button at the top of the page to change Protocol Settings.

5. Click **Save** in bottom right to save changes. Saving changes will restart the controller and equipment will be inoperable for a brief period of time.

Figure 7. Identification and Communications



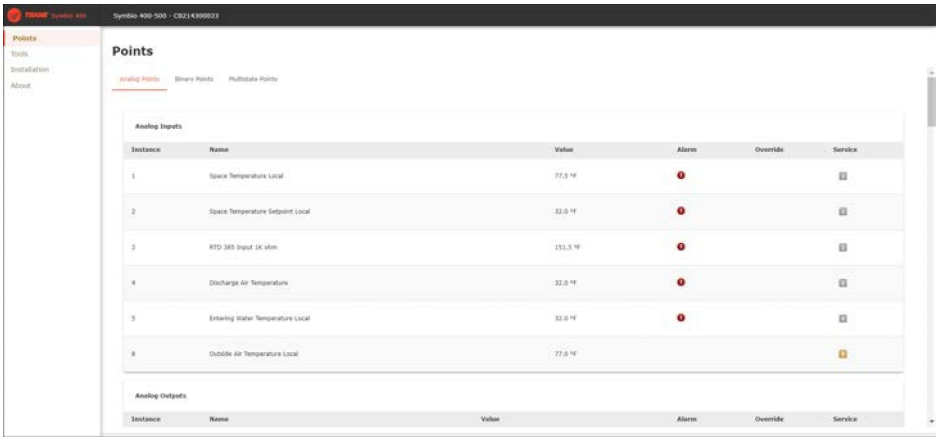
Points

With Symbio UI open in a web browser, navigate to the Points menu on the left-hand navigation.

- The Points menu shows analog, binary, and multistate points that are included in the controller.
- The name, instance number, present value, alarm status, override status and service status of each point is shown.
- Overrides can be initiated or released by clicking on the **Override** icon.
- Points can be put into or taken out of service by clicking on the **Service** icon.

Note: *Points cannot be created or deleted using the Symbio UI tool.*

Figure 8. Symbio points



Tracer SC+ BAS Integration

When Tracer SC+ is the BAS, the integration technician is not required to manually configure the Device ID of the controller. The Tracer SC+ will do this as part of the site discovery and installation process.

Tracer SC+ will perform the following steps:

1. Enable the Use Software Device ID feature.

2. Calculate a unique BACnet Device ID value, based on Tracer SC+ Device ID, MS/TP link number, and MAC address of the unit controller.
3. Send the BACnet Device ID value to the device.

BAS Unit Control

The Symbio 400–B/500 gets controlled by the BAS by changing values of point and placing points in or out of service.

Initiating System Control

By default, the following BACnet points are put out of service and need to be put into service to be used, if required:

- Space Temperature BAS
- Space Humidity BAS
- Outdoor Air Temperature BAS
- Discharge Temperature BAS
- Outside Air Temperature BAS
- Outdoor Air Humidity BAS

Routinely Updating BAS Values

The Symbio 400–B/500 requires the BAS system to provide a routine update to the sensor values. This protects against communication loss between the BAS and the Symbio 400–B/500. By BACnet definition, the present value of the object maintains the last value written to it, regardless of the amount of time that has elapsed since the last write. If communication is lost for several minutes or longer, the present value of BAS-supplied sensor objects may no longer represent the current state of environmental conditions. This may result in decreased occupant comfort and damage to building systems.

BAS Communication Failure

The Symbio 400–B/500 is designed to minimize communication failure mode. It does this by monitoring the length of time that has elapsed since the last *write to the present value* of the sensor object. If the length of time exceeds a predefined limit, the Symbio 400–B/500 will place the object into the fault state and revert to a unit-supplied sensor value for control. At power-up, the sensor objects are set to a fault state and they remain in this state until a *write to the sensor object* is detected. The minimum periodic refresh rate for the objects is 15 minutes. The following list is a set of sensor values that can be supplied by the BAS:

- Space Temperature BAS
- Outdoor Air Temp BAS
- Space Humidity BAS
- Entering Water Temp BAS

Input/Output Commands and Calculations

This section provides the following information about certain inputs and outputs that perform:

- Filter timer reset command
- Diagnostic reset command
- Setpoint calculations

Filter Timer Reset Command

The Symbio 400-B/500 uses the "Filter Runtime Hours" (AV38) to generate a diagnostic ("Diagnostic: Filter Change Required", BV8) when its present value is greater than the "Filter Runtime Hours Setpoint" (AV12) present value. The procedure for resetting the timer is as follows:

Change the state of the "Filter Timer Reset Request" (BV12) to the active state. Upon the change to active state, the Symbio 400-B/500 will set the present value of the "Filter Runtime Hours" (AV38) object to zero and then set the "Filter Timer Reset Request" object back to the inactive state.

Diagnostics Reset Command

The Symbio 400-B/500 control system monitors the operation of the HVAC equipment. If an abnormal condition is detected, an event notification message is sent to the Tracer SC+. The corresponding binary input object will change state from *inactive* to *active* when the diagnostic is detected. The object has been configured to send a BACnet event message to external BACnet devices as defined by the protocol.

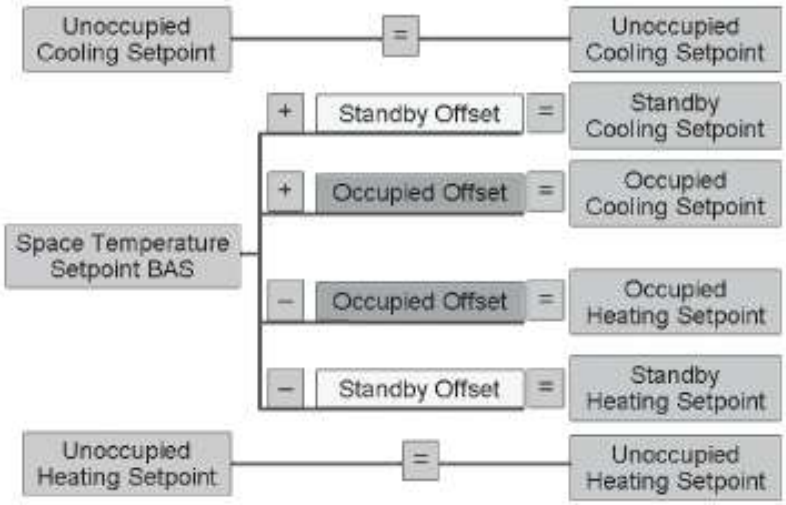
The BAS has the ability to reset internal diagnostics by controlling the state of the *Reset Diagnostic Request* object (BV2) as follows:

- Change the state of the *"Reset Diagnostic Request"* (BV2) to the *active* state.
- •Upon the change to *active* state, the Symbio 400-B/500 control system will reset all internal diagnostics other than BV8 ("Diagnostic: Filter Change Required"), and other than BV8 (*"Diagnostic: Filter Change Required"*) set the state of all the diagnostic objects to *inactive*.
- •Upon completion of this action, the Symbio 400-B/500 will set the present value of the *"Reset Diagnostic Request"* (BV2) object back to the *inactive* state.

Setpoint Calculations

The equipment has the ability to control the air temperature of the space that contains the space air temperature sensor. This value may be provided by wiring the sensor to the unit or by means of a sensor value provided by the BAS.

The illustration below shows how the various temperature setpoints are calculated for space temperature control. When the unit is in an occupied mode the active space temperature setpoint is calculated based on the space temperature setpoint and the two setpoint offset values. In unoccupied mode, the unoccupied heating and cooling setpoints are used as the active setpoint.



Object and Diagnostic Data Points

For quick reference, the following tables are listed and sorted two different ways. Table 1, p. 14 through Table 9, p. 20 are listed by input/output type and sorted by object type. Table 10, p. 21 is sorted by Object Name.

Note: *Not all points are available to the user. The available data points are defined and dependent on the type of equipment and options.*

Table 1. Analog inputs

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AI1	Space Temperature Local	Temperature (°F or °C)	-25°C (-13°F) to 100°C (212°F)	All Units	Local zone temperature or return air temperature.
AI2	Space Temperature Setpoint Local	Temperature (°F or °C)	4.44°C (39.99°F) to 35°C (95°F)	All Units	Local zone sensor setpoint.
AI3	Space Humidity Local	None	0% to 100%	Dehumidification Units	Local relative humidity sensor value.
AI4	Discharge Air Temperature	Temperature (°F or °C)	-50°C (-58°F) to 115°C (239°F)	All Units	Discharge air temperature from equipment.
AI5	Entering Water Temperature Local	Temperature (°F or °C)	-0°C (32°F) to 100°C (212°F)	Auto- changeover Unit	Local sensor entering water temperature.
AI8	Outside Air Temperature Local	Temperature (°F or °C)	-40°C (-40°F) to 70°C (158°F)	All Units	Local outside air temperature sensor.
AI20	Face and Bypass Damper Position Status	None	-1000 to 1000	Face/Bypass Units	Face and bypass damper position in % of stroke time • 0= Full bypass • 100%= Max stroke • Time= Full face
AI21	Space CO^2 Concentration Local	None	0 to 2000	CO_2 Sensing Units	Local carbon dioxide concentration.

Table 2. Analog outputs

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AO1	Outdoor Air Damper Position	None	-1000 to 1000	Modulating Outdoor Air Damper Units (Economizer)	Analog outdoor aire damper output command.
AO2	Chilled Water Valve Command	None	-1000 to 1000	Modulating Cooling (Hydronic) and Changeover Units	Analog chilled water valve command 0% closed.
AO3	Heating Valve Command	None	-1000 to 1000	Modulating Hot Water/Steam Heating Units	Analog heating valve output command 0% closed.
AO4	Electric Heat Command	None	None	Modulating (SCR) Electric Heating Units	Analog electric heat output command.

Table 3. Analog values

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AV1	Outdoor Air Temperature BAS	Temperature (°F or °C)	-15°C (5°F) to 50° C (122°F)	All Units	Communicated outdoor air temperature.
AV2	Space Humidity BAS	None	0% to 100%	Dehumidification Units	Communicated space relative humidity.
AV3	Outdoor Air Temperature Active	Temperature (°F or °C)	-15°C (5°F) to 50° C (122°F)	All Units	Communicated outdoor air temperature.
AV4	Entering Water Temperature BAS	Temperature (°F or °C)	0°C (32°F) to 100°C (212°F)	Changeover Cooling/Heating Units	Communicated entering water temperature.
AV5	Entering Water Temperature Active	Temperature (°F or °C)	0°C 32°F) to 100°C (212°F)	Changeover Cooling/Heating Units	Actively used entering water temperature.
AV6	Space Humidity Active	Percent	0% to 100%	Dehumidification Units	Actively used space relative humidity.

Table 3. Analog values (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AV8	Economizer Minimum Position Setpoint BAS	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Communicated value for minimum economizer position setpoint.
AV9	Fan Off Delay Time	Seconds	0 to 600	All Units	Fan off delay time.
AV10	Compressor Enable BAS	Percent	0% to 100%	DX and Heat Pump Units	Compressor enable limits the compressor capacity for DX cool and heat pump. • 100%; Compressor Enabled. • 1% to 99%; Limits the compressor capacity (for 2 stages of DX: 1% to 50% enables stage 1 and disables stage 2 and 51% to 100% enables both stages). • 0%; Disable Compressor(s).
AV12	Filter Runtime Hours Setpoint	Hours	0 to 10,000	All Units	When the fan runtime exceeds this *Maintenance Request Setpoint Time*, the controller generates a *Maintenance Required* diagnostic (not a specified diagnostic for dirty filter). A value of zero disables this feature and no *Maintenance Required* diagnostic occurs.
AV14	Space Temperature BAS	Temperature (°F or °C)	-15°C (5°F) to 50° C (122°F)	All Units	Communicated space temperature.
AV16	Economizer Request	Percent	0% to 100%	Modulating outdoor air damper units (economizer)	Economizer position request used for manual override control.
AV18	Cool Valve Request	Percent	0% to 100%	Cooling (hydronic) and Changeover Units	Cool valve position request used for manual override control.
AV19	DX Cool Request	Percent	0% to 100%	DX and Heat Pump Units	DX compressor output request used for manual override control.
AV20	Heat Valve Request	Percent	0% to 100%	Hot Water and Steam Heating Units	Heat valve position request used for manual override control.
AV21	Discharge Air Temperature Low Limit Setpoint	Temperature (°F or °C)	-1.1°C (30.02°F) to 10°C (50°F)	All Units	If the discharge air temperature is less than the discharge air low limit for three (3) minutes, the controller trips ON a freeze protection diagnostic. The valves open, the face/bypass damper goes to full face (when applicable), and all other outputs go to the OFF position.
AV22	Electric Heat Request	Percent	0% to 100%	Electric Heating Units	Electric heat request used for manual override control.
AV23	Unoccupied Cooling Setpoint	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.99° F)	All Units	Cooling setpoint used in unoccupied mode.
AV24	Unoccupied Heating Setpoint	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.99° F)	All Units	Heating setpoint used in unoccupied mode.
AV27	Space Temperature Setpoint BAS	Temperature (°F or °C)	-10°C (14°F) to 35°C (95°F)	All Units	Communicate space temperature setpoint.
AV28	Space Temperature Setpoint Active	Temperature (°F or °C)	-10°C (14°F) to 50°C (122°F	All Units	The currently used space temperature setpoint.
AV29	Freeze Avoidance Setpoint	Temperature (°F or °C)	-17.78°C (-0.004° F) to 10°C (50°F)	Hydronic Units	Freeze avoidance setpoint.
AV30	Occupied Offset	Temperature (°F or °C)	0°C (32°F) to 17°C (62.6F)	All Units	The value used to calculate the heating /cooling setpoints in occupied mode and occupied bypass modes. • Active heating setpoint = active setpoint - occupied offset. • Active cooling setpoint = active setpoint + occupied offset.
AV31	Economizer Minimum Position Setpoint Local	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Minimum outside air damper position during occupied mode.

Table 3. Analog values (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AV32	Economizer Enable Minimum Outdoor Air Temperature Setpoint	Temperature (°F or °C)	0.0°C (32°F) to 37.78°C (100.004° F)	Modulating Outdoor Air Damper Units (Economizer)	If the outdoor air temperature is less than the economizing enable point, then economizing is possible. If the outdoor air temperature is great than economizing enable point, plus 5 degrees Fahrenheit, then economizing is not possible. For any other temperature, there is no change in the status of economizing.
AV33	Occupied Bypass Time	Minutes	0 to 240	All Units	Occupied bypass mode time remaining.
AV34	Standby Offset	Temperature (°F or °C)	0°C (32°F) to 17°C (62.6°F)	All Units	The value used to calculate the heating/cooling setpoints in occupied standby mode. • Active heating setpoint = active setpoint - occupied offset. • Active cooling setpoint = active setpoint + occupied offset.
AV35	Exhaust fan Enable Position	Percent	0% to 100%	Exhaust Fan Units	The economizer position at which the exhaust fan turns ON; default is 10%. Internal programming limits this between 0% and 100%. The economizer position must be greater than, or equal to, the *Exhaust Fan Enable Position* in order to turn ON the exhaust fan. The exhaust fan turns OFF 10% below the turn ON point. **Note:** The *Exhaust Fan Enable* must be enabled for this point to have an effect.
AV36	Space Dehumidification Setpoint BAS	Percent	0% to 100%	Dehumidification Units	• Communicated relative humidity (RH) setpoint. • Dehumidification starts when RH greater than RH setpoint. • Dehumidification stops when RH is less than RH setpoint - offset. • To disable dehumidification, override the setpoint to 100%.
AV37	Space Temperature Setpoint Default	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.99° F)	All Units	Default space temperature setpoint when a valid communicated or local space temperature setpoint do not exist.
AV38	Filter Runtime Hours	Hours	0 to 100,000	All Units	Elapsed hours since dirty filter diagnostic (in hours). This value is cleared when *Filter Timer Reset Request* is set to TRUE.
AV58	Standby Minimum Position Setpoint	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Minimum position in occupied standby mode.
AV59	Space Temperature Active	Temperature (°F or °C)	-15°C (5°F) to 50° C (122°F)	All Units	The currently used space temperature.
AV60	Occupied Low Fan Min Position Setpoint	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Minimum position in occupied with low fan speed.
AV63	Supply Fan Speed Request	Percent	0% to 100%	Variable Speed Fan Units (ECM)	• Reported fan speed, 0% is off, then ranges from *Fan Capacity Low* to 100%. • Requests below *Fan Capacity Low* is treated as 0%.
AV64	Fan Capacity Low Limit	Percent	0% to 100%	Variable Speed Fan Units (ECM)	Minimum fan RPMs divided by the maximum RPMs.
AV65	Compressor Lockout Setpoint	Temperature (°F or °C)	-40°C (-40°F) to 40°C (104°F)	Heat Pump Units	Outside air temperature value at which the compressor(s) are disabled.
AV67	Auxiliary Heat Control Request	Percent	0% to 100%	How Water, Steam and Electric Heating Units	Auxiliary heating capacity limit (does not apply to heating with changeover valve or heat pump). • 100%; Full heat capacity is allowed. • 1% to 99%; Limits the heating capacity (for 2 stages of electric heat: 1% to 50% enables stage 1 and disables stage 2 and 51% to 100% enables both stages). • 0%; Disable dedicated hydronic heating and electric heat.
AV68	Space Relative Humidity Offset	None	None	Dehumidification Units	• Dehumidification starts when the relative humidity is greater than relative humidity setpoint. • Dehumidification stops at relative humidity if less than RH setpoint - offset. • Default is 8%.

Table 3. Analog values (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AV69	Economizer Minimum Position Setpoint Active	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Current minimum allowed economizer position.
AV71	Face and Bypass Damper Request	Percent	0% to 100%	Face/Bypass Units	Request is the capacity after the damper/coil curve and diagnostics are applied.
AV73	Supply Fan Speed Status	Percent	0% to 100%	Variable Speed Fan Units (ECM)	• Reported fan speed, 0% is off, then ranges from *Fan Capacity Low* to 100%. • For discrete fans, 0% is OFF, 33% is LOW, 66% is MED, and 100% is HIGH speed.
AV74	Heating Capacity Primary	Percent	0% to 100%	All Units	Primary heating source heat capacity.
AV75	Heating Capacity Secondary	Percent	0% to 100%	All Units	Secondary heating source heat capacity.
AV76	Cooling Capacity Status	Percent	0% to 100!	Cooling Units	Cooling source cool capacity.
AV77	Discharge Air Temperature Maximum Heat Limit	Temperature (°F or °C)	3.33°C (37.40°F) to 65.56°C (150.01° F)	All Units	Heating capacity is limited in order to not exceed this temperature.
AV78	Discharge Air Temperature Minimum Cool Limit	Temperature (°F or °C)	3.33°C (37.40°F) to 65.56°C (150.01° F)	All Units	Cooling capacity is limited in order to not exceed this temperature.
AV81	Electric Heat Stage 1 Fan Output	Percent	0% to 100%	Variable Speed Fan Units (ECM)	Minimum Flow with one stage of electric heat. Code changes fan speed to minimum, then waits for 15 seconds before turning electric heat stage 1 ON.
AV82	Electric Heat Stage 2 Fan Output	Percent	0% to 100%	Variable Speed Fan Units (ECM)	Minimum Flow with one stage of electric heat. Code changes fan speed to minimum, then waits for 15 seconds before turning electric heat stage 2 ON.
AV87	Cooling Setpoint High Limit	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.998° F)	All Units	Value used to limit cooling setpoint.
AV88	Cooling Setpoint Low Limit	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.998° F)	All Units	Value used to limit cooling setpoint.
AV89	Heating Setpoint High Limit	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.998° F)	All Units	Value used to limit heating setpoint.
AV90	Heating Setpoint Low Limit	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.998° F)	All Units	Value used to limit heating setpoint.
AV96	Discharge Air Temperature Design Cool Limit	Temperature (°F or °C)	1.67°C (35.01°F) to 65.56°C (150.008° F)	All Units	Fan speed increased, if possible, to limit discharge air to this temperature.
AV97	Discharge Air Temperature Design Heat Limit	Temperature (°F or °C)	33.33°C (37.99°F) to 65.56°C (150.008°F)	All Units	Fan speed increased, if possible, to limit discharge air to this temperature.
AV108	DCV Minimum Economizer Position at Max Fan Speed	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Damper position with fan speed at maximum.
AV109	DCV Minimum Economizer Position at Min Fan Speed	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Damper position with fan speed at minimum.
AV110	Space CO_2 Limit	PPM	400 to 2,000	Modulating Outdoor Air Damper Units (Economizer)	CO_2 Maximum Setpoint
AV111	Space CO_2 Low Limit	PPM	200 to 2,000	Modulating Outdoor Air Damper Units (Economizer)	CO_2 Minimum Setpoint

Table 3. Analog values (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AV112	Space CO_2 Concentration BAS	PPM	0 to 5,000	All Units	BAS communicated CO_2 value
AV113	Space CO_2 Concentration Active	PPM	0 to 5,000	Modulating Outdoor Air Damper (Economizer)	Arbitrated BAS and Local CO_2 value

Table 4. Binary inputs

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
BI1	Occupancy Input	None	None	All Units	Normally open input. • 0 = Occupied • 1 = Unoccupied
BI2	Condensate Overflow Input	None	None	Cooling Units	Normally closed input.
BI3	Low Coil Temperature Detection	None	None	Hydronic Units	Normally closed input. • 1 = Normal • 0 = Low Temperature
BI4	Frost Detection Input	None	None	DX Units	Normally closed input.
BI5	Supply Fan Status	None	None	All Units	Normally open input. • 0 = OFF • 1 = ON (fan running)

Table 5. Binary outputs

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
BO2	Exhaust Fan Start Stop Command	None	None	Exhaust Fan Units	• 0 = OFF • 1 = Running
BO4	Chilled Water Valve Command Binary	None	None	Binary Cooling (Hydronic) and Changeover Units	Binary chilled water command.
BO4	Compressor 1 Command	None	None	DX and Heat Pump units	Compressor 1 command.
BO5	Compressor 2 Command	None	None	Two-stage DX and Heat Pump Units	Compressor 2 command.
BO6	Heating Valve Command Binary	None	None	Binary Hot Water/ Steam Heating Units	Binary heating valve output.
BO6	Electric Heat Output 1	None	None	Staged Electric Heating Units	Electric heat Stage 1 output.
BO7	Reversing Valve Output	None	None	Heat Pump Units	• ON = Cooling • OFF = Heating
BO7	Electric Heat Output 2	None	None	Two-stage Electric Heating Units	Electric heat Stage 2 output.
BO8	Outside Air Damper Binary Output	None	None	Binary Outdoor Air Damper Units (Ventilation)	Binary outdoor air damper output command.

Table 6. Binary values

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
BV1	Supply Fan Configuration Command	None	None	All Units	Fan in occupied mode can continuously cycle on/off with capacity or can be on.
BV2	Reset Diagnostic Request	None	None	All Units	1 = Reset diagnostics. This will reset ALL diagnostics except the *Filter Change Required*. If the condition still exists, the diagnostic reoccurs. After the UC resets the diagnostics, this value automatically reverts back to 0.
BV3	Diagnostic: Discharge Air Temperature Low Limit	None	None	All Units	Freeze Protect Diagnostic (discharge air temp low limit). • 1=Active • 0=Inactive • Latching diagnostic, but will auto-recover.

Table 6. Binary values (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
BV4	Diagnostic: Condensate Overflow	None	None	Cooling Units	Condensate Overflow Diagnostic • 1=Active • 0=Inactive • Latching diagnostic. Cleared with Reset Diagnostic Request or power cycle
BV5	Diagnostic: Low Coil Temperature Detect	None	None	Hydronic Units	Low Coil Temperature Detection Diagnostic. • 1=Active • 0=Inactive • Latching diagnostic, but can auto-recover. Cleared with Reset Diagnostic Request or power cycle
BV6	Diagnostic: Low Air Flow- Supply Fan Failure	None	None	Variable Speed Fan Units (ECM)	Fan status diagnostic.
BV7	Diagnostic: Freeze Avoidance Mode	None	None	Hydronic Units	Freeze Avoidance Diagnostic (only applies to hydronic units). • 1=Active • 0=Inactive • Non-latching (will clear automatically when resolved)
BV8	Diagnostic: Filter Change Required	None	None	All Units	Filter Status Diagnostic (based on fan run hours). • 1=Active • 0=Inactive • Non-latching (will clear automatically when resolved)
BV10	Exhaust Fan Enable	None	None	Exhaust Fan Units	• 0 = Disable • 1 = Enable
BV11	Dehumidification Status	None	None	Dehumidificati on Units	• 1 = Dehumidification is active • 0 = Not active
BV12	Filter Timer Reset Request	None	None	All Units	1 = Reset the filter timer. After the UC resets the timer, this binary value reverts back to 0.
BV13	Reversing Valve Request	None	None	Heat Pump Units	Reversing valve position request used for manual override control.
BV14	Predicted Occupied Heat Cool Mode Status	None	None	All Units	Anticipated Heat Cool mode upon entering the occupied mode. Can be used to help determine required Entering Water Temperature.
BV15	Demand Control Ventilation Enable	None	None	Modulating Outdoor Air Damper Units (Economizer)	Enables Demand Control Ventilation.

Table 7. Multi-state inputs

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
MI1	Supply Fan Speed Local	None	None	All Units	Local fan speed setting.
MI2	Timed Override Status	None	None	All Units	Timed override request from zone sensor.
MI3	Communication Status	None	None	All Units	• 1 = Comm Up • 2 = Comm Down • 3 = No Parent Configured
MI4	IMC Status	None	None	Variable Speed Fan Units (ECM)	• 1 = ok • 2 = commLoss • 3 = newConfig • 4 = hwMismatch • 5 = swMismatch • 6 = hwVersion • 7 = swVersion • 8 = nvDataMismatch • 9 = dupRotarySwitch • 10 = extraDevice • 11 = rotarySwitchNotFound

Table 8. Multi-state output

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
MO1	Supply Fan Speed BAS	None	None	Always	• For a 1 speed fan: 2 = Off, 5 = High • For a 2 speed fan: 2 = Off, 3 = Low, 5 = High • For a 3 speed fan: 2 = Off, 3 = Low, 4 = Medium, 5 = High

Table 9. Multi-state value

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
MV1	Supply Fan Speed Active	None	None	Discrete 1-, 2-and 3- Speed Fan Units	Active supply fan speed for discrete fan speed.
MV4	Heat Cool Mode Request	None	None	All Units	• 1 = Auto • 2 = Heat • 3 = Morning warm-up • 4 = Cool • 5 = Night Purge [treats this as Auto] • 6 = Pre Cool • 7 = Off • 8 = Test (status only) • 9 = Emergency Heat (treat this as Auto) • 10 = Fan Only (economizer at min) • 11 = Free Cool (treats this as Auto) • 12 = Ice-Making (treat this as Auto) • 13 = Max Heat (treats this as Auto) • 14 = Economizer (treats as Auto) • 15 = Dehumidify (treats this as Auto] • 16 = Calibrate
MV5	Heat Cool Mode Status	None	None	All Units	Actual heat/cool mode status.
MV6	Occupancy Request	None	None	All Units	• 1 = Occupied • 2 = Unoccupied • 3 = Occupied Bypass • 4 = Occupied Standby • 5 = Auto (UC uses local occupancy decision)
MV7	Occupancy Status	None	None	All Units	• 1 = Occupied • 2 = Unoccupied • 3 = Occupied Bypass • 4 = Occupied Standby
MV8	Supply Fan Speed BAS	None	None	All Units	• 1 = Auto • 2 = Off • 3 = Low • 4 = Medium • 5 = High
MV9	Emergency Override BAS	None	None	All Units	• 1 = Normal • 2 = Pressurize - treated as shutdown • 3 = Depressurized - treated as shutdown • 4 = Purge - treated as shutdown • 5 = Shutdown • 6 = Fire - treated as shutdown
MV10	Economizer Airside Enable BAS	None	None	Modulating Outdoor Air Damper Units (Economizer)	• 1 = Disabled • 2 = Enabled • 3 = Auto *Economizer Auto* means that the controller determines economizer operation. Enabled or Disabled means that economizer operation is allowed or not allowed (respectively), overriding the local decision.
MV11	Number of Fan Speeds	None	None	All Units	• 1 = Zero • 2 = One • 3 = Two • 4 = Three • 5 = Variable Speed
MV13	Outdoor Air Damper Status	None	None	Modulating Outdoor Air Damper Units (Economizer)	• 1 = At or Below Minimum Position • 2 = Above Minimum Position • 3 = Economizer Not Present
MV22	Fan Operating Mode Request	None	1 to 2	Variable Speed Fan Units (ECM)	• 1 = Energy Efficient Mode • 2 = Acoustical Mode If the arbitrated fan switch speed is NOT auto then comfort control is used which is the same as the regular control.
MV23	First Stage Compressor Minimum Fan Speed	None	None	Variable Speed Fan Units (ECM)	• 1= Low • 2= Medium • 3= High (Default) Minimum fan speed when first stage compressor is running (default).

Table 10. All object types sorted by object name

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AV67	Auxiliary Heat Control Request	Percent	0% to 100%	How Water, Steam and Electric Heating Units	Auxiliary heating capacity limit (does not apply to heating with changeover valve or heat pump). • 100%; Full heat capacity is allowed. • 1% to 99%; Limits the heating capacity (for 2 stages of electric heat: 1% to 50% enables stage 1 and disables stage 2 and 51% to 100% enables both stages). • 0%; Disable dedicated hydronic heating and electric heat.
AO2	Chilled Water Valve Command	None	-1000 to 1000	Modulating Cooling (Hydronic) and Changeover Units	Analog chilled water valve command 0% closed.
BO4	Chilled Water Valve Command Binary	None	None	Binary Cooling (Hydronic) and Changeover Units	Binary chilled water command.
MI3	Communication Status	None	None	All Units	• 1 = Comm Up • 2 = Comm Down • 3 = No Parent Configured
BO4	Compressor 1 Command	None	None	DX and Heat Pump units	Compressor 1 command.
BO5	Compressor 2 Command	None	None	Two-stage DX and Heat Pump Units	Compressor 2 command.
AV10	Compressor Enable BAS	Percent	0% to 100%	DX and Heat Pump Units	Compressor enable limits the compressor capacity for DX cool and heat pump. • 100%; Compressor enabled. • 1% to 99%; Limits the compressor capacity (for 2 stages of DX: 1% to 50% enables stage 1 and disables stage 2 and 51% to 100% enables both stages). 0%; Disable compressor(s).
AV65	Compressor Lockout Setpoint	Temperature (°F or °C)	-40°C (-40°F) to 40°C (104°F)	Heat Pump Units	Outside air temperature value at which the compressor(s) are disabled.
BI2	Condensate Overflow Input	None	None	Cooling Units	Normally closed input. • 1= Normal • 0 = Overflow
AV18	Cool Valve Request	Percent	0% to 100%	Cooling (hydronic) and Changeover Units	Cool valve position request used for manual override control.
AV76	Cooling Capacity Status	Percent	0% to 100!	Cooling Units	Cooling source cool capacity.
MV2	Cooling Fan Speed Default	None	None	None	Do not use.
AV87	Cooling Setpoint High Limit	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.998° F)	All Units	Value used to limit cooling setpoint.
AV88	Cooling Setpoint Low Limit	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.998° F)	All Units	Value used to limit cooling setpoint.
AV108	DCV Minimum Economizer Position at Max Fan Speed	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Damper position with fan speed at maximum.
AV109	DCV Minimum Economizer Position at Min Fan Speed	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Damper position with fan speed at minimum.
BV11	Dehumidification Status	None	None	Dehumidification Units	• 1 = Dehumidification is Active • 0 = Not Active
BV15	Demand Control Ventilation Enable	None	None	Modulating Outdoor Air Damper Units (Economizer)	Enables Demand Control Ventilation.

Table 10. All object types sorted by object name (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
BV4	Diagnostic: Condensate Overflow	None	None	Cooling Units	Condensate Overflow Diagnostic • 1=Active • 0=Inactive • Latching diagnostic. Cleared with Reset Diagnostic Request or power cycle.
BV3	Diagnostic: Discharge Air Temperature Low Limit	None	None	All Units	Freeze Protect Diagnostic (discharge air temp low limit). • 1=Active • 0=Inactive • Latching diagnostic, but will auto-recover.
BV8	Diagnostic: Filter Change Required	None	None	All Units	Filter Status Diagnostic (based on fan run hours). • 1=Active • 0=Inactive • Non-latching (will clear automatically when resolved)
BV7	Diagnostic: Freeze Avoidance Mode	None	None	Hydronic Units	Freeze Avoidance Diagnostic (only applies to hydronic units). • 1=Active • 0=Inactive • Non-latching (will clear automatically when resolved)
BV6	Diagnostic: Low Air Flow- Supply Fan Failure	None	None	Variable Speed Fan Units (ECM)	Fan Status Diagnostic. • 1=Active • 0=Inactive • Latching; Cleared with Reset Diagnostic Request or power cycle
BV5	Diagnostic: Low Coil Temperature Detect	None	None	Hydronic Units	Low Coil Temperature Detection Diagnostic. • 1=Active • 0=Inactive • Latching diagnostic, but can auto-recover. Cleared with Reset Diagnostic Request or power cycle
AI4	Discharge Air Temperature	Temperature (°F or °C)	-50°C (-58°F) to 115°C (239°F)	All Units	Discharge air temperature from equipment.
AV96	Discharge Air Temperature Design Cool Limit	Temperature (°F or °C)	1.67°C (35.01°F) to 65.56°C (150.008° F)	All Units	Fan speed increased, if possible, to limit discharge air to this temperature.
AV97	Discharge Air Temperature Design Heat Limit	Temperature (°F or °C)	33.33°C (37.99°F) to 65.56°C (150.008° F)	All Units	Fan speed increased, if possible, to limit discharge air to this temperature.
AV21	Discharge Air Temperature Low Limit Setpoint	Temperature (°F or °C)	-1.1°C (30.02°F) to 10°C (50°F)	All Units	If the discharge air temperature is less than the discharge air low limit for three (3) minutes, the controller trips ON a freeze protection diagnostic. The valves open, the face/bypass damper goes to full face (when applicable), and all other outputs go to the OFF position.
AV77	Discharge Air Temperature Maximum Heat Limit	Temperature (°F or °C)	3.33°C (37.40°F) to 65.56°C (150.01° F)	All Units	Heating capacity is limited in order to not exceed this temperature.
AV78	Discharge Air Temperature Minimum Cool Limit	Temperature (°F or °C)	3.33°C (37.40°F) to 65.56°C (150.01° F)	All Units	Cooling capacity is limited in order to not exceed this temperature.
AV19	DX Cool Request	Percent	0% to 100%	DX and Heat Pump Units	DX compressor output request used for manual override control.
MV10	Economizer Airside Enable BAS	None	None	Modulating Outdoor Air Damper Units (Economizer)	• 1 = Disabled • 2 = Enabled • 3 = Auto *Economizer Auto* means that the controller determines economizer operation. *Enabled* or *Disabled* means that economizer operation is allowed or not allowed (respectively), overriding the local decision.

Table 10. All object types sorted by object name (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AV32	Economizer Enable Minimum Outdoor Air Temperature Setpoint	Temperature (°F or °C)	0.0°C (32°F) to 37.78°C (100.004° F)	Modulating Outdoor Air Damper Units (Economizer)	If the outdoor air temperature is less than the economizing enable point, then economizing is possible. If the outdoor air temperature is great than economizing enable point, plus 5 degrees Fahrenheit, then economizing is not possible. For any other temperature, there is no change in the status of economizing.
AV69	Economizer Minimum Position Setpoint Active	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Current minimum allowed economizer position.
AV8	Economizer Minimum Position Setpoint BAS	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Communicated value for minimum economizer position setpoint.
AV31	Economizer Minimum Position Setpoint Local	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Minimum outside air damper position during occupied mode.
AV16	Economizer Request	Percent	0% to 100%	Modulating outdoor air damper units (economizer)	Economizer position request used for manual override control.
AO4	Electric Heat Command	None	None	Modulating (SCR) Electric Heating Units	Analog electric heat output command.
BO6	Electric Heat Output 1	None	None	Staged Electric Heating Units	Electric heat Stage 1 output.
BO7	Electric Heat Output 2	None	None	Two-stage Electric Heating Units	Electric heat Stage 2 output.
AV22	Electric Heat Request	Percent	0% to 100%	Electric Heating Units	Electric heat request used for manual override control.
AV81	Electric Heat Stage 1 Fan Output	Percent	0% to 100%	Variable Speed Fan Units (ECM)	Minimum Flow with one stage of electric heat. Code changes fan speed to minimum, then waits for 15 seconds before turning electric heat stage 1 ON.
AV82	Electric Heat Stage 2 Fan Output	Percent	0% to 100%	Variable Speed Fan Units (ECM)	Minimum Flow with one stage of electric heat. Code changes fan speed to minimum, then waits for 15 seconds before turning electric heat stage 2 ON.
MV9	Emergency Override BAS	None	None	All Units	• 1 = Normal • 2 = Pressurize - treated as shutdown • 3 = Depressurized - treated as shutdown • 4 = Purge - treated as shutdown • 5 = Shutdown • 6 = Fire - treated as shutdown
AV5	Entering Water Temperature Active	Temperature (°F or °C)	0°C 32°F) to 100°C (212°F)	Changeover Cooling/Heating Units	Actively used entering water temperature.
AV4	Entering Water Temperature BAS	Temperature (°F or °C)	0°C (32°F) to 100°C (212°F)	Changeover Cooling/Heating Units	Communicated entering water temperature.
AI5	Entering Water Temperature Local	Temperature (°F or °C)	-0°C (32°F) 100°C (212°F)	Auto- changeover Unit	Local sensor entering water temperature.
BV10	Exhaust Fan Enable	None	None	Exhaust Fan Units	• 0 = Disable • 1 = Enable
AV35	Exhaust fan Enable Position	Percent	0% to 100%	Exhaust Fan Units	The economizer position at which the exhaust fan turns ON; default is 10%. Internal programming limits this between 0% and 100%. The economizer position must be greater than, or equal to, the *Exhaust Fan Enable Position* in order to turn ON the exhaust fan. The exhaust fan turns OFF 10% below the turn ON point. **Note: The** *Exhaust Fan Enable* must be enabled for this point to have an effect.
BO2	Exhaust Fan Start Stop Command	None	None	Exhaust Fan Units	• 0 = Off • 1 = Running

Table 10. All object types sorted by object name (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AI20	Face and Bypass Damper Position Status	None	-1000 to 1000	Face/Bypass Units	Face and bypass damper position in % of stroke time • 0= Full bypass • 100%= Max stroke • Time= Full face
AV71	Face and Bypass Damper Request	Percent	0% to 100%	Face/Bypass Units	Request is the capacity after the damper/coil curve and diagnostics are applied.
AV67	Auxiliary Heat Control Request	Percent	0% to 100%	How Water, Steam and Electric Heating Units	Auxiliary heating capacity limit (does not apply to heating with changeover valve or heat pump). • 100%; Full heat capacity is allowed. • 1% to 99%; Limits the heating capacity (for 2 stages of electric heat: 1% to 50% enables stage 1 and disables stage 2 and 51% to 100% enables both stages). • 0%; Disable dedicated hydronic heating and electric heat.
AO2	Chilled Water Valve Command	None	-1000 to 1000	Modulating Cooling (Hydronic) and Changeover Units	Analog chilled water valve command 0% closed.
BO4	Chilled Water Valve Command Binary	None	None	Binary Cooling (Hydronic) and Changeover Units	Binary chilled water command.
MI3	Communication Status	None	None	All Units	• 1 = Comm Up • 2 = Comm Down • 3 = No Parent Configured
BO4	Compressor 1 Command	None	None	DX and Heat Pump units	Compressor 1 command.
BO5	Compressor 2 Command	None	None	Two-stage DX and Heat Pump Units	Compressor 2 command.
AV10	Compressor Enable BAS	Percent	0% to 100%	DX and Heat Pump Units	Compressor enable limits the compressor capacity for DX cool and heat pump. • 100%; Compressor enabled. • 1% to 99%; Limits the compressor capacity (for 2 stages of DX: 1% to 50% enables stage 1 and disables stage 2 and 51% to 100% enables both stages). 0%; Disable compressor(s).
AV65	Compressor Lockout Setpoint	Temperature (°F or °C)	-40°C (-40°F) to 40°C (104°F)	Heat Pump Units	Outside air temperature value at which the compressor(s) are disabled.
BI2	Condensate Overflow Input	None	None	Cooling Units	Normally closed input. • 1= Normal • 0 = Overflow
AV18	Cool Valve Request	Percent	0% to 100%	Cooling (hydronic) and Changeover Units	Cool valve position request used for manual override control.
AV76	Cooling Capacity Status	Percent	0% to 100!	Cooling Units	Cooling source cool capacity.
MV2	Cooling Fan Speed Default	None	None	None	Do not use.
AV87	Cooling Setpoint High Limit	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.998° F)	All Units	Value used to limit cooling setpoint.
AV88	Cooling Setpoint Low Limit	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.998° F)	All Units	Value used to limit cooling setpoint.
AV108	DCV Minimum Economizer Position at Max Fan Speed	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Damper position with fan speed at maximum.
AV109	DCV Minimum Economizer Position at Min Fan Speed	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Damper position with fan speed at minimum.
BV11	Dehumidification Status	None	None	Dehumidification Units	• 1 = Dehumidification is Active • 0 = Not Active

Table 10. All object types sorted by object name (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
BV15	Demand Control Ventilation Enable	None	None	Modulating Outdoor Air Damper Units (Economizer)	Enables Demand Control Ventilation.
BV4	Diagnostic: Condensate Overflow	None	None	Cooling Units	Condensate Overflow Diagnostic • 1=Active • 0=Inactive • Latching diagnostic. Cleared with Reset Diagnostic Request or power cycle.
BV3	Diagnostic: Discharge Air Temperature Low Limit	None	None	All Units	Freeze Protect Diagnostic (discharge air temp low limit). • 1=Active • 0=Inactive • Latching diagnostic, but will auto-recover.
BV8	Diagnostic: Filter Change Required	None	None	All Units	Filter Status Diagnostic (based on fan run hours). • 1=Active • 0=Inactive • Non-latching (will clear automatically when resolved)
BV7	Diagnostic: Freeze Avoidance Mode	None	None	Hydronic Units	Freeze Avoidance Diagnostic (only applies to hydronic units). • 1=Active • 0=Inactive • Non-latching (will clear automatically when resolved)
BV6	Diagnostic: Low Air Flow- Supply Fan Failure	None	None	Variable Speed Fan Units (ECM)	Fan Status Diagnostic. • 1=Active • 0=Inactive • Latching; Cleared with Reset Diagnostic Request or power cycle
BV5	Diagnostic: Low Coil Temperature Detect	None	None	Hydronic Units	Low Coil Temperature Detection Diagnostic. • 1=Active • 0=Inactive • Latching diagnostic, but can auto-recover. Cleared with Reset Diagnostic Request or power cycle
AI4	Discharge Air Temperature	Temperature (°F or °C)	-50°C (-58°F) to 115°C (239°F)	All Units	Discharge air temperature from equipment.
AV96	Discharge Air Temperature Design Cool Limit	Temperature (°F or °C)	1.67°C (35.01°F) to 65.56°C (150.008° F)	All Units	Fan speed increased, if possible, to limit discharge air to this temperature.
AV97	Discharge Air Temperature Design Heat Limit	Temperature (°F or °C)	33.33°C (37.99°F) to 65.56°C (150.008° F)	All Units	Fan speed increased, if possible, to limit discharge air to this temperature.
AV21	Discharge Air Temperature Low Limit Setpoint	Temperature (°F or °C)	-1.1°C (30.02°F) to 10°C (50°F)	All Units	If the discharge air temperature is less than the discharge air low limit for three (3) minutes, the controller trips ON a freeze protection diagnostic. The valves open, the face/bypass damper goes to full face (when applicable), and all other outputs go to the OFF position.
AV77	Discharge Air Temperature Maximum Heat Limit	Temperature (°F or °C)	3.33°C (37.40°F) to 65.56°C (150.01° F)	All Units	Heating capacity is limited in order to not exceed this temperature.
AV78	Discharge Air Temperature Minimum Cool Limit	Temperature (°F or °C)	3.33°C (37.40°F) to 65.56°C (150.01° F)	All Units	Cooling capacity is limited in order to not exceed this temperature.
AV19	DX Cool Request	Percent	0% to 100%	DX and Heat Pump Units	DX compressor output request used for manual override control.
MV10	Economizer Airside Enable BAS	None	None	Modulating Outdoor Air Damper Units (Economizer)	• 1 = Disabled • 2 = Enabled • 3 = Auto *Economizer Auto* means that the controller determines economizer operation. *Enabled* or *Disabled* means that economizer operation is allowed or not allowed (respectively), overriding the local decision.

Table 10. All object types sorted by object name (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AV32	Economizer Enable Minimum Outdoor Air Temperature Setpoint	Temperature (°F or °C)	0.0°C (32°F) to 37.78°C (100.004° F)	Modulating Outdoor Air Damper Units (Economizer)	If the outdoor air temperature is less than the economizing enable point, then economizing is possible. If the outdoor air temperature is great than economizing enable point, plus 5 degrees Fahrenheit, then economizing is not possible. For any other temperature, there is no change in the status of economizing.
AV69	Economizer Minimum Position Setpoint Active	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Current minimum allowed economizer position.
AV8	Economizer Minimum Position Setpoint BAS	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Communicated value for minimum economizer position setpoint.
AV31	Economizer Minimum Position Setpoint Local	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Minimum outside air damper position during occupied mode.
AV16	Economizer Request	Percent	0% to 100%	Modulating outdoor air damper units (economizer)	Economizer position request used for manual override control.
AO4	Electric Heat Command	None	None	Modulating (SCR) Electric Heating Units	Analog electric heat output command.
BO6	Electric Heat Output 1	None	None	Staged Electric Heating Units	Electric heat Stage 1 output.
BO7	Electric Heat Output 2	None	None	Two-stage Electric Heating Units	Electric heat Stage 2 output.
AV22	Electric Heat Request	Percent	0% to 100%	Electric Heating Units	Electric heat request used for manual override control.
AV81	Electric Heat Stage 1 Fan Output	Percent	0% to 100%	Variable Speed Fan Units (ECM)	Minimum Flow with one stage of electric heat. Code changes fan speed to minimum, then waits for 15 seconds before turning electric heat stage 1 ON.
AV82	Electric Heat Stage 2 Fan Output	Percent	0% to 100%	Variable Speed Fan Units (ECM)	Minimum Flow with one stage of electric heat. Code changes fan speed to minimum, then waits for 15 seconds before turning electric heat stage 2 ON.
MV9	Emergency Override BAS	None	None	All Units	• 1 = Normal • 2 = Pressurize - treated as shutdown • 3 = Depressurized - treated as shutdown • 4 = Purge - treated as shutdown • 5 = Shutdown • 6 = Fire - treated as shutdown
AV5	Entering Water Temperature Active	Temperature (°F or °C)	0°C 32°F) to 100°C (212°F)	Changeover Cooling/Heating Units	Actively used entering water temperature.
AV4	Entering Water Temperature BAS	Temperature (°F or °C)	0°C (32°F) to 100°C (212°F)	Changeover Cooling/Heating Units	Communicated entering water temperature.
AI5	Entering Water Temperature Local	Temperature (°F or °C)	-0°C (32°F) 100°C (212°F)	Auto- changeover Unit	Local sensor entering water temperature.
BV10	Exhaust Fan Enable	None	None	Exhaust Fan Units	• 0 = Disable • 1 = Enable
AV35	Exhaust fan Enable Position	Percent	0% to 100%	Exhaust Fan Units	The economizer position at which the exhaust fan turns ON; default is 10%. Internal programming limits this between 0% and 100%. The economizer position must be greater than, or equal to, the *Exhaust Fan Enable Position* in order to turn ON the exhaust fan. The exhaust fan turns OFF 10% below the turn ON point. **Note: The** *Exhaust Fan Enable* must be enabled for this point to have an effect.
BO2	Exhaust Fan Start Stop Command	None	None	Exhaust Fan Units	• 0 = Off • 1 = Running

Table 10. All object types sorted by object name (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AI20	Face and Bypass Damper Position Status	None	-1000 to 1000	Face/Bypass Units	Face and bypass damper position in % of stroke time • 0= Full bypass • 100%= Max stroke • Time= Full face
AV71	Face and Bypass Damper Request	Percent	0% to 100%	Face/Bypass Units	Request is the capacity after the damper/coil curve and diagnostics are applied.
AV64	Fan Capacity Low Limit	Percent	0% to 100%	Variable Speed Fan Units (ECM)	Minimum fan RPMs divided by the maximum RPMs.
AV9	Fan Off Delay Time	Seconds	0 to 600	All Units	Fan off delay time.
MV22	Fan Operating Mode Request	None	1 to 2	Variable Speed Fan Units (ECM)	• 1 = Energy Efficient Mode • 2 = Acoustical Mode If the arbitrated fan switch speed is NOT auto then comfort control is used which is the same as the regular control.
AV38	Filter Runtime Hours	Hours	0 to 100,000	All Units	Elapsed hours since dirty filter diagnostic (in hours). This value is cleared when Filter Timer Reset Request is set to TRUE.
AV12	Filter Runtime Hours Setpoint	Hours	0 to 10,000	All Units	When the fan runtime exceeds this *Maintenance Request Setpoint Time*, the controller generates a *Maintenance Required* diagnostic (not a specified diagnostic for dirty filter). A value of zero disables this feature and no *Maintenance Required* diagnostic occurs.
BV12	Filter Timer Reset Request	None	None	All Units	1 = Reset the filter timer. After the UC resets the timer, this BV reverts back to 0.
MV23	First Stage Compressor Minimum Fan Speed	None	None	Variable Speed Fan Units (ECM)	• 1= Low • 2= Medium • 3= High (Default) Minimum fan speed when first stage compressor is running (default).
AV29	Freeze Avoidance Setpoint	Temperature (°F or °C)	-17.78°C (-0.004° F) to 10°C (50°F)	Hydronic Units	Freeze avoidance setpoint.
BI4	Frost Detection Input	None	None	DX Units	Normally closed input. • 1 = Not in Frost • 0 = Defrost
MV4	Heat Cool Mode Request	None	None	All Units	• 1 = Auto • 2 = Heat • 3 = Morning warm-up • 4 = Cool • 5 = Night Purge [treats this as Auto] • 6 = Pre Cool • 7 = Off • 8 = Test (status only) • 9 = Emergency Heat (treat this as Auto) • 10 = Fan Only (economizer at min) • 11 = Free Cool (treats this as Auto) • 12 = Ice-Making (treat this as Auto) • 13 = Max Heat (treats this as Auto) • 14 = Economizer (treats as Auto) • 15 = Dehumidify (treats this as Auto] • 16 = Calibrate
MV5	Heat Cool Mode Status	None	None	All Units	Actual heat/cool mode status.
AV20	Heat Valve Request	Percent	0% to 100%	Hot Water and Steam Heating Units	Heat valve position request used for manual override control.
AV74	Heating Capacity Primary	Percent	0% to 100%	All Units	Primary heating source heat capacity.
AV75	Heating Capacity Secondary	Percent	0% to 100%	All Units	Secondary heating source heat capacity.
AV89	Heating Setpoint High Limit	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.998° F)	All Units	Value used to limit heating setpoint.
AV90	Heating Setpoint Low Limit	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.998° F)	All Units	Value used to limit heating setpoint.

Table 10. All object types sorted by object name (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AO3	Heating Valve Command	None	-1000 to 1000	Modulating Hot Water/Steam Heating Units	Analog heating valve output command 0% closed.
BO6	Heating Valve Command Binary	None	None	Binary Hot Water/ Steam Heating Units	Binary heating valve output.
AV64	Fan Capacity Low Limit	Percent	0% to 100%	Variable Speed Fan Units (ECM)	Minimum fan RPMs divided by the maximum RPMs.
AV9	Fan Off Delay Time	Seconds	0 to 600	All Units	Fan off delay time.
MV22	Fan Operating Mode Request	None	1 to 2	Variable Speed Fan Units (ECM)	• 1 = Energy Efficient Mode • 2 = Acoustical Mode If the arbitrated fan switch speed is NOT auto then comfort control is used which is the same as the regular control.
AV38	Filter Runtime Hours	Hours	0 to 100,000	All Units	Elapsed hours since dirty filter diagnostic (in hours). This value is cleared when Filter Timer Reset Request is set to TRUE.
AV12	Filter Runtime Hours Setpoint	Hours	0 to 10,000	All Units	When the fan runtime exceeds this *Maintenance Request Setpoint Time*, the controller generates a *Maintenance Required* diagnostic (not a specified diagnostic for dirty filter). A value of zero disables this feature and no *Maintenance Required* diagnostic occurs.
BV12	Filter Timer Reset Request	None	None	All Units	1 = Reset the filter timer. After the UC resets the timer, this BV reverts back to 0.
MV23	First Stage Compressor Minimum Fan Speed	None	None	Variable Speed Fan Units (ECM)	• 1= Low • 2= Medium • 3= High (Default) Minimum fan speed when first stage compressor is running (default).
AV29	Freeze Avoidance Setpoint	Temperature (°F or °C)	-17.78°C (-0.004° F) to 10°C (50°F)	Hydronic Units	Freeze avoidance setpoint.
BI4	Frost Detection Input	None	None	DX Units	Normally closed input. • 1 = Not in Frost • 0 = Defrost
MV4	Heat Cool Mode Request	None	None	All Units	• 1 = Auto • 2 = Heat • 3 = Morning warm-up • 4 = Cool • 5 = Night Purge [treats this as Auto] • 6 = Pre Cool • 7 = Off • 8 = Test (status only) • 9 = Emergency Heat (treat this as Auto) • 10 = Fan Only (economizer at min) • 11 = Free Cool (treats this as Auto) • 12 = Ice-Making (treat this as Auto) • 13 = Max Heat (treats this as Auto) • 14 = Economizer (treats as Auto) • 15 = Dehumidify (treats this as Auto] • 16 = Calibrate
MV5	Heat Cool Mode Status	None	None	All Units	Actual heat/cool mode status.
AV20	Heat Valve Request	Percent	0% to 100%	Hot Water and Steam Heating Units	Heat valve position request used for manual override control.
AV74	Heating Capacity Primary	Percent	0% to 100%	All Units	Primary heating source heat capacity.
AV75	Heating Capacity Secondary	Percent	0% to 100%	All Units	Secondary heating source heat capacity.
AV89	Heating Setpoint High Limit	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.998° F)	All Units	Value used to limit heating setpoint.
AV90	Heating Setpoint Low Limit	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.998° F)	All Units	Value used to limit heating setpoint.

Table 10. All object types sorted by object name (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AO3	Heating Valve Command	None	-1000 to 1000	Modulating Hot Water/Steam Heating Units	Analog heating valve output command 0% closed.
BO6	Heating Valve Command Binary	None	None	Binary Hot Water/ Steam Heating Units	Binary heating valve output.
MI4	IMC Status	None	None	Variable Speed Fan Units (ECM)	• 1 = ok • 2 = commLoss • 3 = newConfig • 4 = hwMismatch • 5 = swMismatch • 6 = hwVersion • 7 = swVersion • 8 = nvDataMismatch • 9 = dupRotarySwitch • 10 = extraDevice • 11 = rotarySwitchNotFound
BI3	Low Coil Temperature Detection	None	None	Hydronic Units	Normally closed input. • 1 = Normal • 0 = Low Temperature
MV11	Number of Fan Speeds	None	None	All Units	• 1 = Zero • 2 = One • 3 = Two • 4 = Three • 5 = Variable Speed
BI1	Occupancy Input	None	None	All Units	Normally open input. • 0 = Occupied • 1 = Unoccupied
MV6	Occupancy Request	None	None	All Units	• 1 = Occupied • 2 = Unoccupied • 3 = Occupied bypass • 4 = Occupied standby • 5 = Auto (UC uses local occupancy decision)
MV7	Occupancy Status	None	None	All Units	• 1 = Occupied • 2 = Unoccupied • 3 = Occupied bypass • 4 = Occupied standby
AV33	Occupied Bypass Time	Minutes	0 to 240	All Units	Occupied bypass mode time remaining.
AV60	Occupied Low Fan Min Position Setpoint	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Minimum position in occupied with low fan speed.
AV30	Occupied Offset	Temperature (°F or °C)	0°C (32°F) to 17°C (62.6F)	All Units	The value used to calculate the heating /cooling setpoints in occupied mode and occupied bypass modes. • Active heating setpoint = active setpoint - occupied offset. • Active cooling setpoint = active setpoint + occupied offset.
AO1	Outdoor Air Damper Position	None	-1000 to 1000	Modulating Outdoor Air Damper Units (Economizer)	Analog outdoor aire damper output command.
MV13	Outdoor Air Damper Status	None	None	Modulating Outdoor Air Damper Units (Economizer)	• 1 = At or Below Minimum Position • 2 = Above Minimum Position • 3 = Economizer Not Present
AV3	Outdoor Air Temperature Active	Temperature (°F or °C)	-15°C (5°F) to 50° C (122°F)	All Units	Communicated outdoor air temperature.
AV1	Outdoor Air Temperature BAS	Temperature (°F or °C)	-15°C (5°F) to 50° C (122°F)	All Units	Communicated outdoor air temperature.
BO8	Outside Air Damper Binary Output	None	None	Binary Outdoor Air Damper Units (Ventilation)	Binary outdoor air damper output command.
AI8	Outside Air Temperature Local	Temperature (°F or °C)	-40°C (-40°F) to 70°C (158°F)	All Units	Local outside air temperature sensor.

Table 10. All object types sorted by object name (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
BV14	Predicted Occupied Heat Cool Mode Status	None	None	All Units	Anticipated Heat Cool mode upon entering the occupied mode. Can be used to help determine required Entering Water Temperature.
BV2	Reset Diagnostic Request	None	None	All Units	1 = Reset diagnostics. This will reset ALL diagnostics except the Filter Change Required. If the condition still exists, the diagnostic reoccurs. After the UC resets the diagnostics, this value automatically reverts back to 0.
BO7	Reversing Valve Output	None	None	Heat Pump Units	• ON = Cooling • OFF = Heating
BV13	Reversing Valve Request	None	None	Heat Pump Units	Reversing valve position request used for manual override control.
AV113	Space CO2 Concentration Active	PPM	0 to 5,000	Modulating Outdoor Air Damper Units (Economizer)	Arbitrated BAS and Local CO2 value
AV112	Space CO2 Concentration BAS	PPM	0 to 5,000	All Units	BAS communicated CO2 value
AI21	Space CO2 Concentration Local	None	0 to 2000	CO2 Sensing Units	Local carbon dioxide concentration.
AV110	Space CO2 Limit	PPM	400 to 2,000	Modulating Outdoor Air Damper Units (Economizer)	CO2 Maximum Setpoint
AV111	Space CO2 Low Limit	PPM	200 to 2,000	Modulating Outdoor Air Damper Units (Economizer)	CO2 Minimum Setpoint
AV36	Space Dehumidification Setpoint BAS	Percent	0% to 100%	Dehumidification Units	• Communicated relative humidity (RH) setpoint. • Dehumidification starts when RH greater than RH setpoint. • Dehumidification stops when RH is less than RH setpoint - offset. • To disable dehumidification, override the setpoint to 100%.
AV6	Space Humidity Active	Percent	0% to 100%	Dehumidification Units	Actively used space relative humidity.
AV2	Space Humidity BAS	None	0% to 100%	Dehumidification Units	Communicated space relative humidity.
AI3	Space Humidity Local	None	0% to 100%	Dehumidification Units	Local relative humidity sensor value.
AV68	Space Relative Humidity Offset	None	None	Dehumidification Units	• Dehumidification starts when the relative humidity is greater than relative humidity setpoint. • Dehumidification stops at relative humidity if less than RH setpoint - offset. • Default is 8%.
AV59	Space Temperature Active	Temperature (°F or °C)	-15°C (5°F) to 50° C (122°F)	All Units	The currently used space temperature.
AV14	Space Temperature BAS	Temperature (°F or °C)	-15°C (5°F) to 50° C (122°F)	All Units	Communicated space temperature.
AI1	Space Temperature Local	Temperature (°F or °C)	-25°C (-13°F) to 100°C (212°F)	All Units	Local zone temperature or return air temperature.
AV28	Space Temperature Setpoint Active	Temperature (°F or °C)	-10°C (14°F) to 50°C (122°F	All Units	The currently used space temperature setpoint.
AV27	Space Temperature Setpoint BAS	Temperature (°F or °C)	-10°C (14°F) to 35°C (95°F)	All Units	Communicate space temperature setpoint.
AV37	Space Temperature Setpoint Default	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.99° F)	All Units	Default space temperature setpoint when a valid communicated or local space temperature setpoint do not exist.
AI2	Space Temperature Setpoint Local	Temperature (°F or °C)	4.44°C (39.99°F) to 35°C (95°F)	All Units	Local zone sensor setpoint.
AV58	Standby Minimum Position Setpoint	Percent	0% to 100%	Modulating Outdoor Air Damper Units (Economizer)	Minimum position in occupied standby mode.

Table 10. All object types sorted by object name (continued)

Object Type	Object Name	Units of Measure	Min /Max	When the Point Exists	Description
AV34	Standby Offset	Temperature (°F or °C)	0°C (32°F) to 17°C (62.6°F)	All Units	The value used to calculate the heating/cooling setpoints in occupied standby mode. • Active heating setpoint = active setpoint - occupied offset. • Active cooling setpoint = active setpoint + occupied offset.
BV1	Supply Fan Configuration Command	None	None	All Units	Fan in occupied mode can continuously cycle on/off with capacity or can be on.
MV1	Supply Fan Speed Active	None	None	Discrete 1-, 2- and 3- Speed Fan Units	Active supply fan speed for discrete fan speed.
MO1	Supply Fan Speed BAS	None	None	Always	• For a 1 speed fan: 2 = Off, 5 = High • For a 2 speed fan: 2 = Off, 3 = Low, 5 = High • For a 3 speed fan: 2 = Off, 3 = Low, 4 = Medium, 5 = High
MV8	Supply Fan Speed BAS	None	None	All Units	• 1 = Auto • 2 = Off • 3 = Low • 4 = Medium • 5 = High
MI1	Supply Fan Speed Local	None	None	All Units	Local fan speed setting.
AV63	Supply Fan Speed Request	Percent	0% to 100%	Variable Speed Fan Units (ECM)	• Reported fan speed, 0% is off, then ranges from Fan Capacity Low to 100%. • Requests below Fan Capacity Low is treated as 0%.
AV73	Supply Fan Speed Status	Percent	0% to 100%	Variable Speed Fan Units (ECM)	• Reported fan speed, 0% is off, then ranges from Fan Capacity Low to 100%. • For discrete fans, 0% is OFF, 33% is LOW, 66% is MED, and 100% is HIGH speed.
BI5	Supply Fan Status	None	None	All Units	Normally open input. • 0 = OFF • 1 = ON (fan running)
MI2	Timed Override Status	None	None	All Units	Timed override request from zone sensor.
AV23	Unoccupied Cooling Setpoint	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.99° F)	All Units	Cooling setpoint used in unoccupied mode.
AV24	Unoccupied Heating Setpoint	Temperature (°F or °C)	4.44°C (39.99°F) to 46.11°C (114.99° F)	All Units	Heating setpoint used in unoccupied mode.

Alarming

The Symbio 400–B/500 has several objects used for communicating alarms to the system.

Table 11. Alarm objects

Object Type	Object Name	Description	Notification Class
AI1	Space Temperature Local	Local zone sensor temperature or return air temperature.	2
AI2	Space Temperature Setpoint Local	Local zone sensor setpoint.	2
AI3	Space Humidity Local	Local humidity sensor value.	2
AI4	Discharge Air Temperature	Discharge air temperature from equipment.	2
AI5	Entering Water Temperature Local	Local sensor entering water temperature.	2
AI21	Space CO2 Concentration Local	Local carbon dioxide concentration.	2
AV59	Space Temperature Active	The currently used space temperature.	2
BI4	Frost Detection Input	Normally closed input. • 1 = Not in Frost • 0 = Defrost	4
BV3	Diagnostic: Discharge Air Temperature Low Limit	• 0 = Inactive • 1 = Active	4
BV4	Diagnostic: Condensate Overflow	Condensate Overflow Diagnostic • 1=Active • 0=Inactive • Latching diagnostic. Cleared with Reset Diagnostic Request or power cycle	2
BV5	Diagnostic: Low Coil Temperature Detect	Low Coil Temperature Detection Diagnostic. • 1=Active • 0=Inactive • Latching diagnostic, but can auto-recover. Cleared with Reset Diagnostic Request or power cycle	2
BV6	Diagnostic: Low Air Flow- Supply Fan Failure	Fan status diagnostic. • 1=Active • 0=Inactive • Latching; Cleared with Reset Diagnostic Request or power cycle	2
BV7	Diagnostic: Freeze Avoidance Mode	• 0 = active • 1 = Inactive Non-latching will clear automatically when resolved.	4
BV8	Diagnostic: Filter Change Required	Filter Status Diagnostic (based on fan run hours). • 1=Active • 0=Inactive • Non-latching (will clear automatically when resolved)	4
MI4	IMC Status	• 1 = ok • 2 = commLoss • 3 = newConfig • 4 = hwMismatch • 5 = swMismatch • 6 = hwVersion • 7 = swVersion • 8 = nvDataMismatch • 9 = dupRotarySwitch • 10 = extraDevice • 11 = rotarySwitchNotFound	2

Additional Resources

- *Tracer BACnet Terminator Installation Instructions* (BAS-SVN214*-EN)
- *Symbio 500 Programmable Controller Installation, Operation, and Maintenance Manual* (BAS-SVX090*-EN)

Notes

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