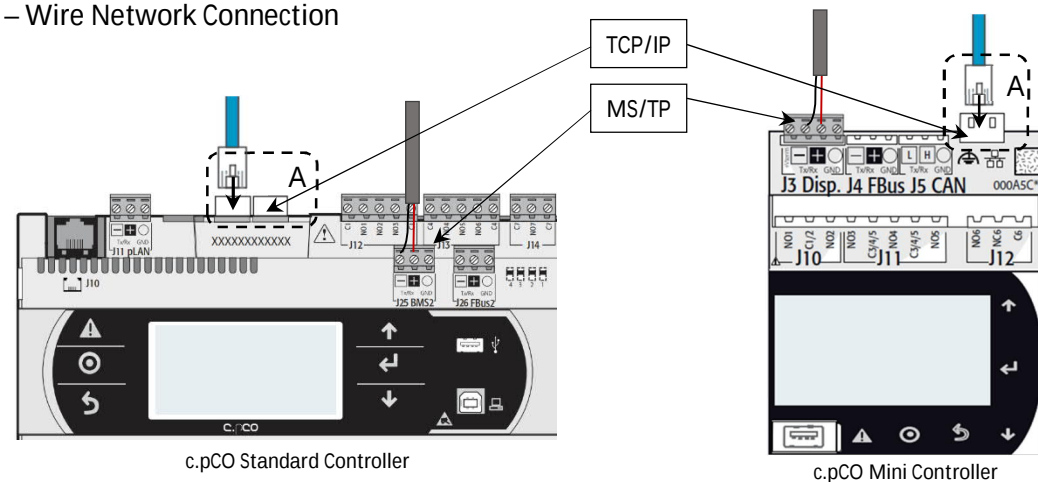
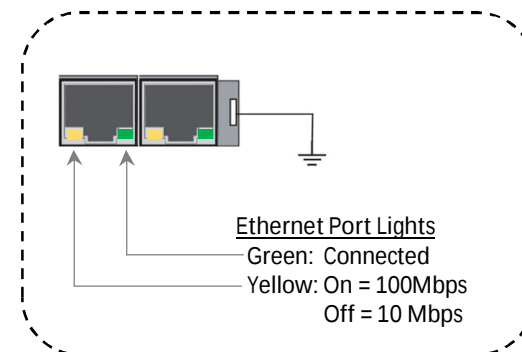


BACnet Quick Start Guide

1 – Wire Network Connection



A – Ethernet Port Lights



2 – Adjust BACnet Network Settings

Menu Structure Reference		
⊙	Main Menu	
↓	Ctrl Variables	←
↓	Advanced	←
↓	Login	←
↓	Network Settings	←

2.1 – Enter User Password

```

User Login
Enter Password: 9998
Current Access:
Read Only
    
```

2.2 – BACnet MS/TP Settings

```

BACnet MS/TP Config
Device: 0077077
Info Frames: 20
Max Masters: 127
Mstr Address: 77
Baud Rate: 9600
Save Settings: □
    
```

2.2 – BACnet IP Settings

```

PCU Board Address
Enable DHCP: □
IP: 192.168. 0.100
Mask: 255.255.255. 0
GW: 192.168. 0. 1
DNS: 192.168. 0. 1
Save Changes: □
    
```

```

BACnet IP Config
Device: 0077077
Port: 0047808
    
```

3 – Command Unit Operation

1. Enable Unit
2. Control Occupancy
3. Reset Alarms
4. Global Alarm Notification
5. Control Temperature Setpoint (optional)

Object	Object Name	Object Description	Active Text	Inactive Text
			Variable Type	
BV-2	System_Enable	Master system enable/disable point.	Enabled	Disabled
BV-3	BMS_Occupancy_Command	Occupancy Command	Unoccupied	Occupied
BV-4	Reset_All_Alarms	Alarm Reset Command	Reset	Normal
BV-23	Global_Alarm	Alarm Notification (any alarm by default)	Alarm	Normal
AV-1	Temperature_Setpoint	Sets the active temperature set-point based on mode of operation (space setpoint, return setpoint or supply setpoint). Not applicable for outside reset.	Default = 72°F Min = 50°F; Max = 100°F	

Reference Guide for BACnet Integration

Please read and save these instructions for future reference. The information in this guide assumes the controller was already configured with BACnet based on the original sales configuration. If the controller does not have BACnet enabled, please contact the equipment representative to get the necessary licensing and configuration files to allow BACnet communication to be used.

DOAS_10.006 Rev 5

Document Date: 09/2025

Basic Unit Integration

Below are the basic integration functions available on all equipment regardless of control mode. Some features are unit configuration dependent (heating type, cooling type, etc.). The controller's BMS points list is static regardless of configuration to accommodate field configuration changes, however, not all points are applicable to every unit. Once the required sensors are installed in the equipment, the only mandatory requirements to make the unit operational are to enable the unit, if it hasn't been enabled manually at the controller, and to command occupancy as desired.

Object	Variable	Description	Active Text	Inactive Text
Unit Enable/Disable Operation				
If desired, the unit can be enabled and disabled by the BMS system. In disabled mode, certain safety sequences may operate to protect the building and/or equipment, but general heating, cooling and ventilation operation will not function.				
BV-2	System_Enable	Master system enable/disable command	Enabled	Disabled
Unit Occupancy Control				
By default, the unit occupancy is expected to be commanded by the BMS occupancy point. Alternatively, unit occupancy can be controlled by an internal schedule, set to always unoccupied, always occupied or controlled by a digital input by changing the occupancy mode selection at the controller.				
If the controller is configured for warm-up/cool-down mode, after the occupancy command is received the unit will run in unoccupied recirculation mode until reaching the occupied temperature setpoint or the warm-up/cool down time expires (default 30 minutes) at which point the controller will enter normal occupied mode operation.				
BV-3	BMS_Occupancy_Command	Building Occupancy Command	Unoccupied	Occupied
Alarms				
The following points allow the notification of any alarm, and the last alarm triggered to be read, as well as active alarms that to be manually reset remotely. See the unit's full BMS points list if specific alarm monitoring or trending is desired.				
BV-4	Reset_All_Alarms	Alarm Reset Command	Reset	Normal
BV-23	Global_Alarm	Global Alarm	Alarm	Normal
BV-29	Supply_Fan_1_Alarm.Active	Supply Fan Alarm Active	Alarm	Normal
BV-30	Exhaust_Fan_1_Alarm.Active	Exhaust Fan Alarm Active	Alarm	Normal
BV-31	Drain_Pan_Alarm.Active	Condensate Drain Pain Alarm	Alarm	Normal
BV-32	Fire_Safety_Shutdown_Alarm.Active	Fire Safety Shutdown Alarm Active	Alarm	Normal
BV-33	Refrigerant_Leak_Compressor_Alarm.Active	Refrigerant Leak Compressor Alarm Active	Alarm	Normal
BV-34	Refrigerant_Leak_Airstream_Alarm.Active	Refrigerant Leak Airstream Alarm Active	Alarm	Normal
IV-5 or AV-93	LatestAlm	Most recent active alarm	See Alarm Table	
Monitoring Unit Operation				
Unit status				
AV-40	Unit_Status_Mode	Unit Operation Mode/State	See Status Mode Table	
Fans and Dampers				
BI-1	Exhaust_Fan_1_Status_Digital_Input	Exhaust Fan 1 Status	Active	Inactive
BI-2	Supply_Fan_1_Status_Digital_Input	Supply Fan 1 Status	Active	Inactive
AV-73	Exhaust_Fan_Speed_Analog_Output	Exhaust Fan Speed Analog Output	Real (%)	
AV-78	Outside_Air_Damper_Analog_Output	Outside Air Damper Analog Output	Real (%)	
AV-79	Supply_Fan_Speed_Analog_Output	Supply Fan Speed Analog Output	Real (%)	
Cooling				
IV-11 or AV-105	Cooling_is_On	Indicates that the unit is cooling	See Binary Tables	
AV-42	Cooling_1_Ramp_Capacity	Cooling Ramp 1 Status Value	Real (%)	
Heating				
IV-11 or AV-105	Heating_is_On	Indicates that the unit is heating	See Binary Tables	
AV-51	Heating_Capacity	Heating Ramp	Real (%)	
Filters				
IV-10 or AV-102	Filter Alarm Digital Input	Filter Alarm Digital Input Status	See Binary Tables	

Object	Variable	Description	Active Text	Inactive Text
Energy Recovery				
IV-10 or AV-102	Heat_Wheel_Enable_Digital_Output	Heat Wheel Enable Digital Output	See Binary Tables	
IV-10 or AV-102	Wheel_Rotation_Alarm	Heat Wheel Rotation Alarm		
AV-72	Energy_Recovery_Analog_Output	Energy Recovery Analog Output		
Refrigeration Systems				
IV-6 or AV-94	Compressor_1_Enable_Digital_Output	Compressor 1 Enable Digital Output	See Binary Tables	
IV-6 or AV-94	Compressor_2_Enable_Digital_Output	Compressor 2 Enable Digital Output		
IV-6 or AV-94	Compressor_3_Enable_Digital_Output	Compressor 3 Enable Digital Output		
IV-6 or AV-94	Compressor_4_Enable_Digital_Output	Compressor 4 Enable Digital Output		
AV-50	HP_Ramp_Capacity	Heat Pump Heating Ramp	Real (%)	
AV-53	Hot_Gas_Reheat_Ramp	Hot Gas Reheat Ramp	Real (%)	
AV-80	Modulating_Compressor_Analog_Output_BMS	Modulating Compressor Analog Output	Real (%)	
Chilled Water Systems				
AV-68	Chilled_Water_1_Valve_Analog_Output	Chilled Water 1 Valve Analog Output	Real (%)	
Hot Water Systems				
AV-74	Hot_Water_Valve_1_Analog_Output	Hot Water Valve 1 Analog Output	Real (%)	
IG Furnaces				
IV-6 or AV-95	Furnace_1_Stage_1_Digital_Output	Furnace 1 Stage 1 Digital Output	See Binary Tables	
IV-6 or AV-95	Furnace_2_Stage_1_Digital_Output	Furnace 2 Stage 1 Digital Output		
AV-76	Mod_Gas_Furnace_1_Analog_Output	Mod Gas Furnace 1 Analog Output		
Electric Post-Heat				
AV-70	Electric_Heater_1_Analog_Output	Electric Heater 1 Analog Output	Real (%)	
Electric Pre-Heat				
IV-10 or AV-102	PreHeat_Enable_Digital_Output	PreHeat Enable Digital Output	See Binary Tables	
Sensor Values (when equipped)				
AI-1	Space_Temp_Analog_Input	Space Air Temperature	Real (°F)	
AI-2	Supply_Temp_Analog_Input	Supply(discharge) Air Temperature	Real (°F)	
AI-3	Outside_Air_Temp_Analog_Input	Outside Air Temperature	Real (°F)	
AI-4	Mixed_Temp_Analog_Input	Mixed Air Temperature	Real (°F)	
AI-5	Cold_Coil_1_Temp_Analog_Input	Cold Coil 1 Leaving Air Temperature	Real (°F)	
AI-7	Return_Temp_Analog_Input	Return Air Temperature	Real (°F)	
AI-8	Exhaust_Temp_Analog_Input	Exhaust Air Temperature	Real (°F)	
AI-9	Space_RH_Analog_Input	Space Air Relative Humidity	Real (% RH)	
AI-10	Outside_RH_Analog_Input	Outside Air Relative Humidity	Real (% RH)	
AI-11	Return_RH_Analog_Input	Return Air Relative Humidity	Real (% RH)	
AI-12	Return_Duct_Static_Pressure_Analog_Input	Return Duct Static Pressure	Real ("wc)	
AI-13	Space_Static_Pressure_Analog_Input	Space Static Pressure	Real ("wc)	
AI-14	Supply_Duct_Static_Pressure_Analog_Input	Supply Duct Static Pressure	Real ("wc)	
AI-15	Space_CO2_1_Analog_Input	Space 1 CO2 ppm	Real (ppm)	
AI-17	Return_CO2_Analog_Input	Return CO2 ppm	Real (ppm)	
AV-64	Total_Exhaust_Fan_CFM_BMS	Total Exhaust Fan CFM	Real (cfm)	
AV-65	Total_Supply_Fan_CFM_BMS	Total Supply Fan CFM	Real (cfm)	
AV-66	OAD_CFM_BMS	Outdoor Air Damper CFM	Real (cfm)	
Active Setpoints				
AV-41	Supply_Temperature_Calculated_Setpoint	Active Supply Temperature Setpoint	Real (°F)	
AV-90	Coil_Temperature_Calculated_Setpoint	Calculated Coil Leaving Set point	Real (°F)	

Unpacking Bit-Packed Words into Binary Values

Binary values can be combined to create an integer and/or analog words. By doing this, more information is available to the BMS in a smaller number of points and less network traffic. These following words need to be "unpacked" once the BMS receives the value.

Integer Value	Analog Values	Variable	Description	Reference Table
IV-6	AV-94 & AV-95	Device_Enable_DO_Word	Device Enable DO Word	Bit Packed Word See Binary Tables
IV-7	AV-96 & AV-97	Ref_Ckt_PressTemp_Alarm_Word	Refrigeration Circuit Word	
IV-8	AV-98 & AV-99	Device_Offline_Word	Device Offline Word	
IV-9	AV-100 & AV-101	Device_Alarm_Word	Device Alarm Word	
IV-10	AV-102 & AV-103	System_Word	System Word	
IV-11	AV-104 & AV-105	Unit_Status_Word	Unit Status Word	

To unpack the word into the binary values, the value needs to be converted to a binary number. The integer values are 32-bit and the analog value words are 16-bit. The number of bits indicates the potential max number of variables packed into a word. Each bit can either be a 0 (Inactive) or a 1 (Active). Both the integer values and analog values contain the same information. Some building automation systems may have an easier time integrating to one type versus the other.

The BMS may have a solution already intact to pull individual bits from an integer. A "read bit" function looks to return what value a certain bit is in an integer. Bit numbers are 0-31 in a 32-bit integer and 0-15 in a 16-bit analog value with 0 being the lowest bit and the furthest to the right. Bit 31 or bit 15 would be the largest bits and the furthest to the left. *Note: Bit 31 being a value of 1 (active) will result in the integer value being a negative. 16-bit analog values will always be positive.*

If the BMS does not have a "read bit" or "bit extract" function, the binary value of individual bits can be determined by continually dividing the quotient of the integer by 2, the remainder of the division is the value of the bit (0 or 1). A function called Modulo or "mod" is commonly used to return the remainder of the division.

Equation: $x = \text{round down}(a/2^b \text{ mod } 2)$

- x is Boolean value for bit b , where 0 is inactive and 1 is active.
- a is the integer word value.
- b is the bit of the binary number used as an exponent.
- The result of $a/2^b$ maybe a decimal value, after taking the mod 2 (remainder of the value after diving by 2) round down the result, which will truncate the decimals leaving a 0 or a 1 for the bit.

Example:

If the Device_Enable_DO_Word integer value (IV-6) has a decimal value of 3,145,731, the 32-bit integer value is 0011 0000 0000 0000 0011 in binary notation. The analog values (AV-94 & AV-95) have decimal values of 3 and 48, 16-bit words are 0011 and 0011 0000 binary notation. This means both compressor 1, compressor 2, the supply fan and the exhaust fan are all on (value of 1 or active). The rest of the bits in the binary number would be a Boolean value of 0 (inactive). (Please see [Binary Tables](#).)

Breakdown with equation for 32-bit integer example:

- Bit 0 = $3,145,731/2^0 \text{ mod } 2$... this results in a Boolean of 1 or Active for bit 0.
- Bit 1 = $3,145,731/2^1 \text{ mod } 2$... this results in a Boolean of 1 or Active for bit 1.
- Bit 20 = $3,145,731/2^{20} \text{ mod } 2$... this results in a Boolean of 1 or Active for bit 20.
- Bit 21 = $3,145,731/2^{21} \text{ mod } 2$... this results in a Boolean of 1 or Active for bit 21.
- All other bits in the word result in a Boolean of 0 or Inactive.

Table of integer and analog example

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
IV-6	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
AV-94																	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
AV-95																	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0

Modifying Equipment Operation

In addition to commanding unit occupancy, some system level sequences may require feedback from the BMS. Common BMS adjusted sequences include items like supply air temperature reset control, demand control ventilation for multiple zones, and duct static pressure reset.

HEATING AND COOLING OPERATION SETPOINTS

Adjusting Temperature Setpoints			
Controller Provided Sequences – Occupied Mode			
The controller has several stand-alone supply air temperature control modes with setpoints that can be modified by the BMS. These modes include a static supply air temperature setpoint (no-reset) or allows for the supply air temperature setpoint to be reset based on outside air temperature, space temperature, or return air temperature.			
Object	Variable	Description	Default and Ranges
IV-1	Temperature_Reset_Mode	Commands the reset mode during occupied operation.	1 = No Reset, 2 = Space Reset 3 = Return Reset, 4 = Outside Reset
AV-1	Temperature_Setpoint	Sets the temperature setpoint based on mode of operation (space setpoint, return setpoint or supply setpoint). Not applicable for outside reset.	Real, Default = 72°F *Min = 50°F; Max = 100°F
AV-2	Temperature_Heat_Cool_Deadband	Heat/Cool Setpt Deadband when Space or Return reset control is active. Htg Setpt = Temp Setpt - Deadband /2 Clg Setpt = Temp Setpt + Deadband /2	Real, Default = 4°F *Min = 0.5°F; Max = 20°F [Space/Return Heating = 70°F, Space/Return Cooling = 74°F]

* Typical range for standard configuration unit, please verify at point min and max properties.

Controller Provided Sequences – Unoccupied Mode			
When the unoccupied mode of operation is set to night setback temperature, normal operation with unoccupied setpoints, or recirculation with unoccupied setpoints, the following setpoints control unoccupied heating and cooling operation. If night setback is selected as the Unoccupied Mode of operation, the reset mode will not be available to change at the controller and should be set to Space Reset(2).			
Object	Variable	Description	Default and Ranges
IV-2	Temperature_Reset_Mode_Unoccupied	Commands the reset mode during occupied operation.	1 = No Reset, 2 = Space Reset 3 = Return Reset, 4 = Outside Reset
AV-3	Temperature_Setpoint_Unoccupied	Sets the temperature setpoint based on mode of operation (space setpoint, return setpoint or supply setpoint). Not applicable for outside reset.	Real, Default = 70°F *Min = 50°F; Max = 100°F
AV-4	Temperature_Heat_Cool_Deadband_Unoccupied	Heat/Cool Setpt Deadband when Space or Return reset control is active. Unocc Clg Setpt = Temp Setpt Unocc + (Deadband Unocc)/2 Unocc Htg Setpt = Temp Setpt Unocc + (Deadband Unocc)/2	Real, Default = 20°F *Min = 0.5°F; Max = 40°F [Space/Return Heating = 60°F, Space/Return Cooling = 80°F]
BMS Controlled Sequences			
BMS control over reset write to temp setpoint and have mode in No reset.			

* Typical range for standard configuration unit, please verify at point min and max properties.

DEHUMIDIFICATION OPERATION SETPOINTS

Dehumidification Setpoints			
The unit controller will enter occupied dehumidification mode when the dehumidification trigger(s) is met. During dehumidification mode, the cooling system is controlled to maintain the cooling coil leaving air temperature setpoint while the hot gas reheat system (if installed) reheats the air to maintain the active supply air temperature setpoint. For units with space or return humidity sensors, the controller may also actively reset the cooling coil temperature setpoint between minimum and maximum values to maintain the target space/return dehumidification setpoint (% RH). Note: By default, unoccupied dehumidification mode is not active unless a trigger to enter the mode is selected at the unit controller since most spaces do not have an unoccupied dehumidification load.			
Object	Variable	Description	Default and Ranges
AV-5	Cooling_Coil_Setpoint_Min	Primary Cooling Coil Leaving Air Setpoint	Default = 50°F *Min = 46°F; Max = 80°F
AV-6	Cooling_Coil_Setpoint_Max	Maximum Coil Leaving Setpoint if cooling coil rest strategy is used.	Default = 55°F *Min = 46°F; Max = 80°F
AV-7	Dehumidification_Setpoint	Dehumidification Setpoint. %RH for Space or Return control	Default = 55% RH Min = 0%; Max = 100%
AV-11	Unoccupied_Dehumidification_Setpoint	Unoccupied Dehumidification %RH Setpoint	Default = 60% RH Min = 0%; Max = 100%

* Typical range for standard configuration unit, please verify at point min and max properties.

AIRFLOW OPERATION SETPOINTS

Airflow Setpoints			
Airflow operation of supply fan, exhaust fan, and mixing dampers may use setpoints from duct pressure, space pressure, CO2 sensors, or airflow measuring stations to properly control airflow in an application. The Outside Air Damper Minimum Setpoint Occupied applies to all units with modulating outside air dampers. The setpoint is used to establish an absolute minimum position for ventilating the space while allowing other control modes to open the damper further as necessary. Outdoor and recirculating air dampers operate inversely using the same signal.			
Object	Variable	Description	Default and Ranges
AV-21	Return_Duct_Static_Pressure_Setpoint	Return Duct Static Pressure Setpoint	Default = -2.0"wc Min = 0.0"wc; Max = -5.0"wc
AV-22	Space_Static_Pressure_Setpoint	Space Static Pressure Setpoint	Default = 0.05"wc Min = -0.5"wc; Max = 0.5"wc
AV-23	Supply_Duct_Static_Pressure_Setpoint	Supply Duct Static Pressure Setpoint	Default = 1.0"wc Min = 0.0"wc; Max = 5.0"wc
AV-24	Space_CO2_Setpoint	Space CO2 Setpoint	Default = 1,000 ppm Min = 0 ppm; Max = 5,000 ppm
AV-25	Outside_Air_Damper_Minimum_Setpoint_Occ	Outside Air Damper Minimum Setpoint Occupied	Default = 35% Min = 0%; Max = 100%

BMS Enabled Control

BMS WATCHDOG

When directly commanding fans speeds, damper positions, or sending sensor values, the unit controller requires the BMS Watchdog point to be written to on a recurring basis. This tells the unit controller that the BMS is still actively communicating.

BMS Watchdog				
The BMS Watchdog must be written to True (1) regularly to verify communication is established between the unit controller and the BMS headend system. If the BMS Watchdog value remains False(0) for longer than the Timeout Delay (15 minutes, adjustable), an alarm is generated and the controller falls back to local control and sensor values, as applicable, instead of using BMS commanded values.				
Object	Variable	Description	Active Text	Inactive Text
BV-1	BMS_Watchdog	BMS Watchdog command	Active	Inactive
BV-24	BMS_Watchdog_Active	Status of the BMS watchdog ping.	Active	Inactive

CONTROLLING AIRFLOW DEVICES

If desired, the speeds and positions of airflow devices can be controlled directly using BACnet commandable points. To control the devices via the BMS, the BMS Watchdog requirements must be satisfied.

Fan Controls				
Fan speeds can be controlled directly though BMS points. The binary points enable the BMS to take control and the analog values command the speeds as a percentage between the allowed minimum and maximum values set in the controller.				
Supply Fan				
Object	Variable	Description	Active Text	Inactive Text
BV-17	SF_Control_Source_BMS	Allows the BMS to control supply fan speed	BMS	Local
AV-36	SF_Control_Signal_BMS	Supply Fan Command Speed	Real (%) *Min=50%; Max=100%	
Exhaust Fan				
BV-18	EF_Control_Source_BMS	Allows the BMS to control exhaust fan speed	BMS	Local
AV-37	EF_Control_Signal_BMS	Exhaust Fan Command Speed	Real (%) Min=25%; Max=100%	

Outdoor Air/Recirculation Air Damper Control				
The outdoor air damper position can be controlled directly by the BMS to adjust the mixture of outdoor air and recirculation air on units configured for recirculation. Minimum and maximum values for occupied and unoccupied mode set at the unit controller are enforced.				
Object	Variable	Description	Active Text	Inactive Text
BV-19	OAD_Control_Source_BMS	Allows the BMS to control OAD position	BMS	Local
AV-38	OAD_Control_Signal_BMS	Outside Air Damper Control Signal via BMS	Real (%) Min=0%; Max=100%	

* Typical range for standard configuration unit, please verify at point min and max properties.

SENDING SENSOR VALUES

Sensor values required for sequence operation can be sent to the controller over dedicated BMS points in place of a sensor wired to the controller (local sensor). When values are communicated to the controller over BMS, the BMS Watchdog must be satisfied. If the watchdog isn't satisfied, the controller reverts to the local sensor (if installed and valid) to control the unit or falls back to local control until the BMS watchdog is satisfied.

Object	Variable	Description	Active Text	Inactive Text
BMS Writeable Sensor Values				
To write the sensor values over BMS, first command the controller to use the BMS value using the corresponding binary value and then use the corresponding analog value to send the sensor value.				
Sensor Sources				
BV-7	Outside_RH_Source_BMS	Outside RH Source Selection	BMS	Local
BV-8	Outside_Temp_Source_BMS	Outside Temp Source Selection	BMS	Local
BV-9	Return_RH_Source_BMS	Return RH Source Selection	BMS	Local
BV-10	Return_Temp_Source_BMS	Return Temp Source Selection	BMS	Local
BV-11	Space_1_CO2_Source_BMS	Space 1 CO2 Source Selection	BMS	Local
BV-12	Space_2_CO2_Source_BMS	Space 2 CO2 Source Selection	BMS	Local
BV-13	Return_CO2_Source_BMS	Return CO2 Source Selection	BMS	Local
BV-14	Space_RH_Source_BMS	Space RH Source Selection	BMS	Local
BV-15	Space_Static_Source_BMS	Space Static Source Selection	BMS	Local
BV-16	Space_Temp_Source_BMS	Space Temp Source Selection	BMS	Local
Sensor Values				
AV-26	Outside_RH_from_BMS	Outside RH from BMS.	Real (% RH)	
AV-27	Outside_Temp_from_BMS	Outside Temp from BMS	Real (°F)	
AV-28	Return_RH_from_BMS	Return RH from BMS	Real (% RH)	
AV-29	Return_Temp_from_BMS	Return Temp from BMS	Real (°F)	
AV-30	Space_1_CO2_from_BMS	Space 1 CO2 from BMS	Real (ppm)	
AV-31	Space_2_CO2_from_BMS	Space 2 CO2 from BMS	Real (ppm)	
AV-32	Return_CO2_from_BMS	Return CO2 from BMS	Real (ppm)	
AV-33	Space_RH_from_BMS	Space RH from BMS	Real (% RH)	
AV-34	Space_Static_from_BMS	Space Static from BMS	Real ("wc)	
AV-35	Space_Temp_from_BMS	Space Temp from BMS	Real (°F)	

Advanced BACnet Settings

Menu Structure Reference

⊙	Main Menu	
↓	Control Variables	↩
↓	Advanced	↩
↓	Network Settings	↩
↓	Advanced Settings	↩

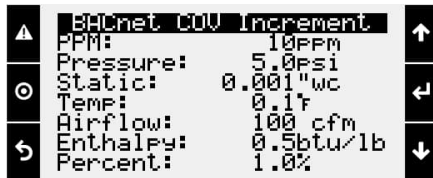
Additional settings can be accessed in the BACnet Advanced Settings menu including BACnet Broadcast Management Device (BBMD) configuration, relinquish default settings, Change of Value (COV) increments and restoring binary text values.

BBMD CONFIGURATION

⬆	BACnet IP Config	⬆
⬆	Foreign Device Config	⬆
⬆	Access: Read	⬆
⬆	BBMD: 000.000.000.000	⬆
⬆	Time to Live: 60	⬆

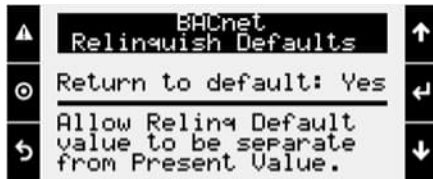
To configure the controller to operate with a BACnet Broadcast Management Device (BBMD) on IP networks, go to the advanced BACnet settings menu and enter the IP address of the BBMD, foreign device configuration, and time to live settings.

COV INCREMENTS

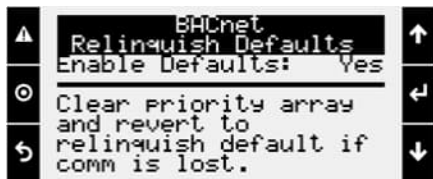


BACnet COV is an optional portion of BACnet that supports providing new values/information only after an increase or decrease of the value is at least the listed COV increment. The controller's COV increments are based on the unit of measure. All variables with the same unit of measure share the same COV increment value. Values can be adjusted on this screen, or by writing to the COV increment property of any BACnet object.

RELINQUISH DEFAULT SETTINGS



When the Return to Default function is enabled, the present value will not overwrite the relinquish default value and on a loss of power the controller will boot with last saved default values instead of last written values. This must also be enabled for the BACnet Comm Loss relinquish default to work.



When the Enable Relinquish Default function is enabled any value in the priority array for binary values or analog values will be cleared if a communication loss is detected. All commandable points will revert to the relinquish default value.



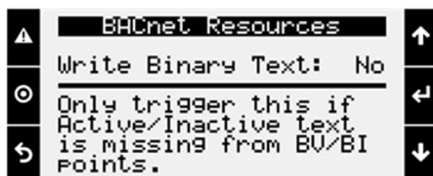
Communication loss is determined based on the BMS Watchdog. The watchdog function must be enabled. The function will execute 5 minutes after the watchdog status goes inactive.

This may be desired if the BMS is running a reset routine on the setpoints and would like to revert to a default state if communication is lost. It is recommended to be used with return to default enabled, and a known relinquish default is saved.

When this box is checked by a user, the controller will write the present value of variables to the relinquish default for all binary and analog value BACnet objects that are commandable. The function operates in the background and takes approximately 30 seconds to complete.

This is desired to save any Test and Balance settings adjusted locally on the controller to be the BACnet relinquish default values. Alternatively, these values could be read and written to the relinquish default variables by the BMS system.

BINARY TEXT



If for any reason, the state text is missing from binary objects, checking this box will cause the controller to re-write the active and inactive text values.

STATUS MODE TABLE

The following analog values can appear in the point to tell the building automation the current mode of operation of the unit. Values may rotate every three seconds.

UNIT STATUS MODE TABLE (AV-40)					
0	Standby	14	System Shutdown Alarm	27	A2L Refrigerant Leak Alarm
1	Unoccupied Start	15	Supply Fan Only	28	A2L Refrigerant Leak Alarm Fan Only Mode
2	Occupied Start	16	Exhaust Fan Only	29	Dehumidifying with Heat
3	Opening Dampers	17	Fans Only Purge (Supply & Exhaust)	30	Overrides
5	Dampers Open	18	Case Heat Active	31	Expansion Offline
6	Fan Start Delay	19	Fans Only	32	
7	Exhaust Fan Start	20	Economizing	33	Energy Recovery Active
8	Supply Fan Start	21	Cooling	34	Hot Gas Reheat Active
9	Startup Delay	22	Heating	35	Morning Sequence Active
10	System On	23	Dehumidifying	36	Heat Pump Defrost
11	Soft Shutdown	24		37	Winter Ramp Active
12	System Disabled	25	HGRH Purging		
13	Remote Off (S1 Open)	26	Energy Recovery Defrost Active		

ALARM TABLE

This table displays the latest alarm that is active in the unit controller.

Latest Alarm Table (BACnet IV-5/AV-93)					
0	No Active Alarms	67	Secondary Unit Offline - Unit 3	126	First Inverter Offline - Modbus Comms Lost
1	Supply Fan 1 Run - Status Not Proven	68	Secondary Unit Offline - Unit 4	127	First Inverter Lockout - Cycle Power to Unit
3	High Supply Duct - Static Pressure	69	Primary Unit Offline -	133	Space Thermostat 1 - Sensor Offline
4	Low Return Duct - Static Pressure	71	Multi Devices per Ch - Contact Tech Support	134	Space Thermostat 2 - Sensor Offline
5	Outside Air Temp - Sensor Not Valid	75	Comp Maint Alarm - Run Hours Spt Reached	135	Space Thermostat 3 - Sensor Offline
6	Supply Air Temperature - Sensor Not Valid	76	Supply Air Temperature - High Limit	136	Space Thermostat 4 - Sensor Offline
7	Cold Coil 1 Temp - Sensor Not Valid	77	Space High Static Pres - Shutdown	137	IG Furnace 1 - No flame after 3 tries
9	Exhaust Air Temp - Sensor Not Valid	78	Internal Board Temp - Exceeds -40F or 158F	138	IG Furnace 1 - Large - No flame after 3 tries
10	Mixed Air Temperature - Sensor Not Valid	79	BMS Offline - Watchdog is FALSE	139	IG Furnace 1 Combust - Fan High Pressure Sw
11	Return Air Temperature - Sensor Not Valid	80	Clg Coil Setpt Input - is not valid	140	IG Furnace 1 Ignition - Controller Alarm
12	Space Temperature - Sensor Not Valid	81	Sup Air Setpt Input - is not valid	141	IG Furnace 1 Pressure - Switch Fault Alarm
13	Return Air RH - Sensor Not Valid	82	BACnet License - Not Installed	142	IG Furnace 1 Combust - Fan Proving Alarm
14	Space RH - Sensor Not Valid	83	Low Suction SH ExV A - EVD 1 Alarm	143	IG Furnace 1 - Max Retries
15	Outside RH - Sensor Not Valid	84	Low Suction SH ExV B - EVD 1 Alarm	144	IG Furnace 1 - High Limit Trip
16	Low Refrig Pressure - Circuit A	85	LOP A EVD 1 - Low Operating Pressure	145	IG Furnace - pCOe 1 Offline
17	Low Refrig Pressure - Circuit B	87	MOP A EVD 1 - Max Operating Pressure	146	IG Furnace 1 IC Fault - Check Furnace Wiring
20	High Pressure Switch - Circuit A	89	EEV A EVD 1 - Motor Alarm	147	IG Furnace 2 - No flame after 3 tries
21	High Pressure Switch - Circuit B	91	LowSuct A EVD 1 - Refrigerant Temp	148	IG Furnace 2 - Large - No flame after 3 tries
24	Damper End Switch Fail - Dampers not open	93	High Condensing Temp - EVD 1	149	IG Furnace 2 Combust - Fan High Pressure Sw
25	Exhaust Fan 1 Run - Status Not Proven	94	Sens S1 EVD 1 - Sensor Not Valid	150	IG Furnace 2 Ignition - Controller Alarm
26	Filters are Dirty - Replace Filters	95	Sens S2 EVD 1 - Sensor Not Valid	151	IG Furnace 2 Pressure - Switch Fault Alarm
27	Cond Drain Pan Full - Check Drain	96	Sens S3 EVD 1 - Sensor Not Valid	152	IG Furnace 2 Combust - Fan Proving Alarm
28	Exp Board 1 Status - Board is Offline	97	Sens S4 EVD 1 - Sensor Not Valid	153	IG Furnace 2 - Max Retries
29	Exp Board 2 Status - Board is Offline	98	EVD 1 EEPROM Damaged	154	IG Furnace 2 - High Limit Trip
30	Exp Board 3 Status - Board is Offline	99	Incomplete Closing - EVD 1	155	IG Furnace - pCOe 2 Offline
31	Exp Board 4 Status - Board is Offline	100	Emergency Closing - EVD 1	156	IG Furnace 2 IC fault - Check Furnace Wiring
32	BMS Frequent Writes - Reduce Writes	101	EVD 1 Battery	157	Outside Air GreenTrol - Offline or Flow Error
33	Space 1 CO2 - Sensor Not Valid	102	FW Incompatibility - EVD 1	169	ER Wheel High - Differential Pressure
34	Space Static Pressure - Sensor Not Valid	103	EVD 1 Config Error	170	OA Damper Fault - Not Econ and should be

Latest Alarm Table (BACnet IV-5/AV-93)					
35	Supply Duct Stat Press - Sensor Not Valid	104	EVD 1 Comm - EVD 1 is Offline	171	OA Damper Fault - Econ and shouldn't be
36	Return Duct Stat Press - Sensor Not Valid	105	High Discharge Temp - First Inv Envelope	172	OAD Fault - Damper not Modulating
37	Sup Fan 1 AFMS - Sensor Not Valid	106	Low Discharge Pressure - First Inv Envelope	173	OAD Fault - Excess Outdoor Air
38	Exh Fan 1 AFMS - Sensor Not Valid	107	High Suction Pressure - First Inv Envelope	174	IG Furnace 1 - Combustion Fan Alarm
41	Space 2 CO2 - Sensor Not Valid	108	Low Suction Pressure - First Inv Envelope	175	IG Furnace 2 - Combustion Fan Alarm
42	Return CO2 - Sensor Not Valid	109	High Current - First Inv Envelope	176	Supply Fan - VFD Offline
43	Discharge Press Ckt A - Sensor Not Valid	110	High Pressure Ratio - First Inv Envelope	177	Exhaust Fan - VFD Offline
44	Discharge Press Ckt B - Sensor Not Valid	111	Low Pressure Ratio - First Inv Envelope	180	Embedded EVD Error -
47	Suction Press Ckt A - Sensor Not Valid	112	Low Delta P - First Inv Envelope	181	SF VFD Alarm - Check VFD
48	Suction Press Ckt B - Sensor Not Valid	113	High Discharge Press - First Inv Envelope	182	EF VFD Alarm - Check VFD
51	Discharge Temp Ckt A - Sensor Not Valid	114	Compressor Staging - Order Skipped	185	First Inverter - Low Oil Detected
52	Discharge Temp Ckt B - Sensor Not Valid	115	Heat Pump Heating - Locked Out	186	Compressor Refrig Leak - Furnace Locked Out
55	Suction Temp Ckt A - Sensor Not Valid	116	EVD 1 Error - Unexpected Position	187	Airstream Refrig Leak - SF Mitigation Seq
56	Suction Temp Ckt B - Sensor Not Valid	117	High SDT Lockout - Circuit A	188	Fire Shutdown Alarm - Building Fire Alarm
59	Ckt A High Saturated - Discharge Temp	118	High SDT Lockout - Circuit B	189	EA Damper End Switch - Damper is not open
60	Ckt B High Saturated - Discharge Temp	121	First Inverter Alarm - Resettable	190	Liquid Line Temp Ckt A - Sensor Not Valid
63	Supply Air Temperature - Low Limit	122	First Inverter Alarm - Serious	191	Liquid Line Temp Ckt B - Sensor Not Valid
64	Heat Wheel Rotation - Not Detected	123	First Inverter Alarm - Irreversible	192	Liquid Line Pres Ckt A - Sensor Not Valid
65	Secondary Unit Offline - Unit 1	124	First Inverter PEC - Invalid Data Set	193	Liquid Line Pres Ckt B - Sensor Not Valid
66	Secondary Unit Offline - Unit 2	125	First Inverter STO - Safe Torque Off Open		

BIT-PACKED WORD TABLES

The following tables are used to unpack integer and real words into Boolean values. (0 = Inactive; 1 = Active)

Device_Enable_DO_Word Table (IV-6/AV-94 & AV-95)									
IV	IV Bit	AV	AV Bit	Bit Description	IV	IV Bit	AV	AV Bit	Bit Description
6	0	94	0	Compressor 1 Start	6	16	95	0	IG Furnace 1 Start
	1		1	Compressor 2 Start		17		1	IG Furnace 2 Start
	2		2	Compressor 3 Start		18		2	
	3		3	Compressor 4 Start		19		3	
	4		4			20		4	Supply Fan Start
	5		5			21		5	Exhaust Fan Start
	6		6			22		6	
	7		7			23		7	
	8		8	Condenser Fan Ramp 1 Stage 1 Start		24		8	
	9		9	Condenser Fan Ramp 1 Stage 2 Start		25		9	
	10		10	Condenser Fan Ramp 1 Stage 3 Start		26		10	
	11		11			27		11	
	12		12	Condenser Fan Ramp ^(III) Stage 1 Start		28		12	
	13		13	Condenser Fan Ramp 2 Stage 2 Start		29		13	
	14		14	Condenser Fan Ramp 2 Stage 3 Start		30		14	
	15		15			31		15	

Ref_Ckt_PressTemp_Alarm_Word Table (IV-7/AV-96 & AV-97)									
IV	IV Bit	AV	AV Bit	Bit Description	IV	IV Bit	AV	AV Bit	Bit Description
7	0	96	0	Circuit A Discharge Pressure Sensor Alarm	7	16	97	0	Circuit A Liquid Line Pressure Sensor Alarm
	1		1	Circuit A Discharge Temp Sensor Alarm		17		1	Circuit A Liquid Line Temp Sensor Alarm
	2		2	Circuit A Suction Pressure Sensor Alarm		18		2	Circuit B Liquid Line Pressure Sensor Alarm
	3		3	Circuit A Suction Temp Sensor Alarm		19		3	Circuit B Liquid Line Temp Sensor Alarm
	4		4	Circuit B Discharge Pressure Sensor Alarm		20		4	
	5		5	Circuit B Discharge Temp Sensor Alarm		21		5	
	6		6	Circuit B Suction Pressure Sensor Alarm		22		6	
	7		7	Circuit B Suction Temp Sensor Alarm		23		7	
	8		8	Circuit A High Pressure Switch Alarm		24		8	
	9		9	Circuit A Low Refrigerant Pressure Alarm		25		9	
	10		10	Circuit B High Pressure Switch Alarm		26		10	
	11		11	Circuit B Low Refrigerant Pressure Alarm		27		11	
	12		12	Circuit A High Sat Discharge Temp Alarm		28		12	
	13		13	Circuit B High Sat Discharge Temp Alarm		29		13	
	14		14			30		14	
	15		15			31		15	

Device_Offline_Word Table (IV-8/AV-98 & AV-99)									
IV	IV Bit	AV	AV Bit	Bit Description	IV	IV Bit	AV	AV Bit	Bit Description
8	0	98	0	Space TStat 1 Offline	8	16	99	0	IG Furnace Controller 1 Offline
	1		1	Space TStat 2 Offline		17		1	IG Furnace Controller 2 Offline
	2		2	Space TStat 3 Offline		18		2	IG Furnace Controller 3 Offline
	3		3	Space TStat 4 Offline		19		3	IG Furnace Controller 4 Offline
	4		4	VFD Offline Supply Fan		20		4	
	5		5	VFD Offline Exhaust Fan		21		5	
	6		6			22		6	
	7		7			23		7	
	8		8	Expansion Board 1 Alarm		24		8	
	9		9	Expansion Board 2 Alarm		25		9	
	10		10	Expansion Board 3 Alarm		26		10	
	11		11	Expansion Board 4 Alarm		27		11	Primary Unit Offline Alarm
	12		12			28		12	Secondary Unit 1 Offline Alarm
	13		13			29		13	Secondary Unit 2 Offline Alarm
	14		14			30		14	Secondary Unit 3 Offline Alarm
	15		15			31		15	Secondary Unit 4 Offline Alarm

Device_Alarm_Word Table (IV-9/AV-100 & AV-101)									
IV	IV Bit	AV	AV Bit	Bit Description	IV	IV Bit	AV	AV Bit	Bit Description
9	0	100	0	Cold Coil Temperature Sensor Alarm	9	16	101	0	Space CO2 Sensor Alarm
	1		1			17		1	Space RH Sensor Alarm
	2		2	Mixed Temperature Sensor Alarm		18		2	Space Static Pressure Sensor Alarm
	3		3	Supply Duct Static Pressure Sensor Alarm		19		3	Space Temperature Sensor Alarm
	4		4	Supply Fan AFMS Alarm		20		4	IG Furnace Alarm
	5		5	Supply Air Temp Sensor Alarm		21		5	
	6		6	Exhaust Fan AFMS Alarm		22		6	First Inverter Alarm
	7		7	Exhaust Temperature Sensor Alarm		23		7	
	8		8	Outside Air Temp Sensor Alarm		24		8	EVD Valve Alarm
	9		9	Outside RH Sensor Alarm		25		9	
	10		10			26		10	SF VFD Alarm
	11		11	Greentrol OAD AFMS Alarm		27		11	EF VFD Alarm
	12		12	Return CO2 Sensor Alarm		28		12	
	13		13	Return Duct Static Pressure Sensor Alarm		29		13	
	14		14	Return Temperature Sensor Alarm		30		14	
	15		15	Return RH Sensor Alarm		31		15	

System_Word (IV-10/AV-102 & AV-103)									
IV	IV Bit	AV	AV Bit	Bit Description	IV	IV Bit	AV	AV Bit	Bit Description
10	0	102	0	Heat Wheel Enable	10	16	103	0	Shutdown Input Alarm
	1		1	Preheat Enable		17		1	Energy Recovery Wheel High Diff Pressure
	2		2	Reversing Valve (Cooling (0)/Heating(1))		18		2	Energy Recovery Wheel Rotation Alarm
	3		3			19		3	
	4		4	OA Damper End Switch Alarm		20		4	Heat Pump Heating Lock Out Alarm
	5		5	EA Damper End Switch Alarm		21		5	BMS Frequent Writes - Reduce Num of Writes
	6		6	Supply Temp Low Limit Alarm		22		6	BMS Offline Alarm
	7		7	Supply Temp High Limit Alarm		23		7	
	8		8	Supply High Duct Static Alarm		24		8	
	9		9	Supply Fan 1 Alarm		25		9	
	10		10	Exhaust Fan 1 Alarm		26		10	
	11		11	Drain Pan Alarm		27		11	
	12		12			28		12	Heat-Cool Only - Dehumidification Request Active
	13		13	Filter Alarm		29		13	Heat-Cool Only - Heating Request Active
	14		14	Space High Static Alarm		30		14	Heat-Cool Only - Coil Setpoint Alarm Active
	15		15	Return Low Static Alarm		31		15	Heat-Cool Only - Supply Setpoint Alarm Active

Unit_Status_Word Table (IV-11/AV-104 & AV-105)									
IV	IV Bit	AV	AV Bit	Bit Description	IV	IV Bit	AV	AV Bit	Bit Description
11	0	104	0	Off/Standby	11	16	105	0	Case Heat Active
	1		1	Occupied Start		17		1	Fans Only
	2		2	Unoccupied Start		18		2	Economizing
	3		3	Opening Dampers		19		3	Energy Recovery Active
	4		4	Dampers Open		20		4	Cooling
	5		5	Fan Start Delay		21		5	Heating
	6		6	Exhaust Fan On		22		6	Dehumidifying
	7		7	Supply Fan On		23		7	Hot Gas Reheat Active
	8		8	System On		24		8	HGRH Purging
	9		9	Soft Shutdown		25		9	Dehum w/Heat
	10		10	System Disabled		26		10	Energy Recovery Defrost Active
	11		11	Remote Off		27		11	Heat Pump Defrost Active
	12		12	System Shutdown Alarm		28		12	Morning Warm Up/Cool Down Active
	13		13	Supply Fan Only		29		13	Winter Ramp Active
	14		14	Exhaust Fan Only		30		14	
	15		15	Purge Mode (Supply and Exhaust Only)		31		15	Overrides Active